United Nations Development Programme
PEOPLE'S REPUBLIC OF CHINA

PROJECT DOCUMENT

Project Title:	**CBPF-MSL: Strengthening the Management Effectiveness of the Wetland Protected Area System in Hainan for Conservation of Globally Significant Biodiversity**
UNDAF Outcome(s):	Outcome 1: Government and other stakeholders ensure environmental sustainability, address climate change, and promote a green, low carbon economy.

UNDP Strategic Plan Environment and Sustainable Development Primary Outcome: Mobilizing environmental financing

UNDP Strategic Plan Secondary Outcome: Mainstreaming environment and energy

Expected CP Outcome(s): Outcome 4: Low carbon and other environmentally sustainable strategies and technologies are adapted widely to meet China's commitments and compliance with Multilateral Environmental Agreements; and Outcome 5. The vulnerability of poor communities and ecosystems to climate change is reduced.

Expected CPAP Output (s): Output 4.1 Policy and capacity barriers for the sustained and widespread adoption of low carbon and other environmentally sustainable strategies and technologies removed, and Output 5.1 A strengthened policy, legal, institutional framework for the sustainable use of land, water, the conservation of biodiversity, and other natural resources in fragile ecosystems is enforced.

Executing Entity/Implementing Partner: Hainan Forestry Department (HFD), Dongzhaigang Nature Reserve

Implementing Entity/Responsible Partners: HFD, and Dongzhaigang NR

Brief Description

Hainan Island has the largest area of tropical rainforest, mature mangrove and coral reef resources in China, constituting one of the country's most valuable areas for biodiversity conservation. However, the globally significant ecosystems of Hainan Island are fragile and under increasing threat from a number of factors, notably deforestation due to encroachment for agriculture, plantations and urban development. The main wetland areas in Hainan are coastal where pressure is most severe. Mangroves are impacted by aquaculture and coastal development, infrastructure projects and tourism facilities, significant pollution concerns, as well as intense utilization of wetland resources, alien invasive species and impacts of climate change. The long-term solution that this project proposes is to strengthen the PA network in the Province through enhanced management effectiveness and improved financial sustainability.

Forming part of the UNDP/GEF CBPF-MSL programmatic framework, the project goal is: *to contribute to the conservation and sustainable use of globally significant biodiversity in Hainan Province, China.* The project objective is: *to strengthen the management effectiveness of the wetland protected area system in Hainan in response to existing and emerging threats to the globally significant biodiversity and essential ecosystem services.* The focus of the project is to strengthen Hainan's PA system to ensure the protection of a representative sample of its exceptionally rich and unique biodiversity and to more effectively manage the wetland PA subsystem. There are three inter-connected components. Component 1 addresses the spatial, regulatory and institutional deficiencies of the provincial PA system, to enable the provincial government to conserve biodiversity more effectively through the PA system, and to support individual PAs as well as the mangrove PA network under Component 2. It will result in the expansion, consolidation and strengthening of

the provincial PA system. Component 2 aims to bring about significant and fast improvement to the management of Hainan's mangrove PAs (which also include other coastal habitats) by jointly tackling the common issues and threats to these PAs as a group and individually. It will result in the development of a Mangrove PA Network with collectively strengthened management effectiveness. Component 3 tackles the underlying causes of the external threats to the mangrove PAs and PA system, through mainstreaming of wetland PAs in development and sector planning. In turn, mainstreaming and strengthened capacity at provincial level under components 1 and 3 will be applied at site level under component 2. This aims to achieve a strengthened PA system management framework, including improved inter-sectoral coordination, related capacity building, embedding of coastal wetland conservation concerns into cross-sectoral plans, and economic valuation and mainstreaming of wetland ecosystem services including eco-compensation schemes. The achievement of these outcomes would contribute to remove or mitigate the three principal barriers:

1: Insufficient PA coverage and systemic and institutional capacity at provincial level;

2: Limited tools and capacities for wetland PA site management; and

3: Disconnect between wetland PA sub-system management and development planning and sectoral planning.

GEF funding will secure global environmental benefits including: increased resilience and coverage of Hainan's terrestrial PA system from the current 285,600 ha by at least 40,000ha, with improved coverage of under-represented areas and increased connectivity between PAs; strengthened management effectiveness of at leats 6 PAs in the Hainan Mangrove PA Network; a reduction in the annual operational funding gap for national and provincial level PAs; a 1,000 ha increase in PA system coverage of mangroves and increased representation of natural wetland types; and improved ecosystem health of Hainan Mangrove PA sites, indicated using MSL's Ecosystem Health Index (EHI). These will benefit a range of globally endangered and Hainan endemic species, as well as ecosystems represented in the Hainan portion of the Indo-Burma global biodiversity hotspot.

Programme Period:	60 months
Atlas Award ID:	00069892
Project ID:	00084186
PIMS #:	4597
Start date:	June 20, 2013
End Date:	June 19, 2018
Management Arrangements:	NIM
PAC Meeting Date:	May 13, 2013

Total resources required (total project funds)	20,634,771
Total allocated resources	
(UNDP managed funds)	
Regular (UNDP)	700,000
GEF	2,634,771
Other (partner managed resources)	
o Government	17,300,000
Grant	13,000,000
In-Kind	4,300,000

Agreed by Hainan Forestry Department: Liu Yanling 14/6/2013
Date/Month/Year

Agreed by Ministry of Finance of China (MOF): 26/06/2013
Date/Month/Year

Agreed by United Nations Development Programme (UNDP): 28/06/2013
Date/Month/Year

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Acronyms and Abbreviations

ACEDP	Australia China Environmental Development Partnership
ADB	Asian Development Bank
APR	Annual Progress Report
ARCBC	ASEAN Regional Centre for Biodiversity Conservation
ARR	Annual Review Report
ASEAN	Association of South East Asian Nations
BD	Biodiversity
BTOR	Back To Office Report
BWP	Biennial Work Plan
CAS	Chinese Academy of Sciences
CBD	Convention on Biological Diversity
CDR	Combined Delivery Report
CI	Conservation International
CITES	Convention on International Trade in Endangered Species
CNR	County level Nature Reserve
CPAP	Country Programme Action Plan
CR	Critically Endangered (IUCN red list category)
CTA	Chief Technical Advisor
EA	Executing Agency
EAAFP	East Asian – Australasian Flyway Partnership
ECBP	EU-China Biodiversity Programme
EHI	Ecosystem Health Index
EIA	Environmental Impact Assessment
EN	Endangered (IUCN red list category)
EU	European Union
FAO	Food and Agriculture Organization of United Nations
GDP	Gross Domestic Product
GEF	Global Environment Facility
GIS	Geographical Information System
Ha	Hectare
HAD	Hainan Agriculture Department
HBWAPC	Hainan Bureau of Wild Animal and Plant Conservation (of HFD)
HDF	Hainan Department of Finance
HFD	Hainan Forestry Department
HITIMP	Hainan's International Tourism Island Master Plan
HLERD	Hainan Land Environment & Resources Department
HMFD	Hainan Marine & Fisheries Department
HWRD	Hainan Water Resources Department
IA	Implementing Agency
IBA	Important Bird Area
IAS	Invasive Alien Species
IUCN	International Union for the Conservation of Nature
IW	(Project) Inception Workshop
M&E	Monitoring and Evaluation
MEA	Multilateral Environmental Agreement
MEP	Ministry of Environmental Protection
METT	Management Effectiveness Tracking Tool

MOF	Ministry of Finance
MoU	Memorandum of Understanding
MPAN	Mangrove Protected Area Network
MSL	Mainstreams of Life (UNDP GEF Programme)
NBCSAP	National Biodiversity Conservation Strategy and Action Plan
NEX	National Execution
NGO	Non-Governmental Organization
NNR	National Nature Reserve
NPD	National Project Director
NR	Nature Reserve
NRDC	National Reform and Development Commission
NWP	National Wetland Park
PA	Protected Area (6 IUCN categories including nature reserves)
PIF	Project Identification Form (for GEF)
PIMS	Project Information Management System
PIR	Project Implementation Review
PM	Project Manager
PMO	Project Management Office
PNR	Provincial Nature Reserve
PPD	Provincial Project Director
PPG	Project Preparation Grant (for GEF)
PPR	Project Progress Report
PRC	People's Republic of China
PSC	Project Steering Committee
PSCM	Project Steering Committee Meeting
PoWPA	Programme of Work on Protected Areas (of CBD)
Ramsar	Ramsar Convention on Wetlands of International Importance
RARE	An international conservation NGO
RCU	(UNDP-GEF) Regional Coordinating Unit
RMB	Chinese currency unit (Renminbi or Yuan)
RTA	Regional Technical Advisor (of UNDP)
SEA	Strategic Environmental Assessment
SFA	State Forestry Administration
SMART	Specific, Measurable, Achievable, Relevant and Time-bound
SO	Strategic Objective
SOA	State Oceanic Administration
SP	Strategic Programme
SRF	Strategic Results Framework
TOR	Terms of Reference
UN	United Nations
UNDP	United Nations Development Programme
UNDP-CO	UNDP Country Office
UNDP EEG	UNDP Environment and Energy Group
UNFCC	United Nations Framework Convention on Climate Change
UNDAF	United Nations Development Assistance Framework
UNEP	United Nations Environment Programme
US$	United States Dollar
WWF	World Wide Fund for Nature
Y1, Y2, etc.	Year 1, Year 2 , etc.

SECTION I: Elaboration of the Narrative

PART I: Situation Analysis

INTRODUCTION

1. Significant losses of natural habitats and species declines have occurred in Hainan during last few decades, leaving less than 20% natural forest cover and fragmented remnants that are vulnerable to the impacts of continuing rapid economic development, intensive resource use and other environmental change. With a mere 3,857 ha remaining by 2007, mangrove forest resources have been seriously impacted by coastal development and aquaculture practices, despite the fact that Hainan contains the most developed and diverse mangrove forests in China. While there has been significant investment in the PA system and mangroves in Hainan, this has not yet addressed the principle barriers to the development of a sustainable and effective PA system, and funding remains inadequate to cover the operational costs required to achieve biodiversity conservation objectives. As a result, biodiversity continues to be lost inside the PAs due to the combination of weak management capacity and persistent or increasing levels of threat. In common with the general national situation, there has been little or no mainstreaming of ecosystem services into land uses, development planning and sectoral planning. This situation allows external threats arising from incompatible land uses to affect protected areas and biodiversity outside the protected area system. Urgent action is needed to prevent further degradation of critical coastal wetland ecosystems and the loss of biodiversity and ecosystem services.

2. This project therefore aims to address the principal barriers identified in the situation analysis through a systematic approach at different levels of organization in order to strengthen the management effectiveness of Hainan's PA system. The global and national biodiversity significance of Hainan's PA system, owing to its tropical location in the Indo-Burmese Biodiversity Hotspot with additional island endemism values, the nature and severity of on-going threats to the PA system and the persistence of important barriers limiting its effectiveness have led the Government to prioritise and present this project for GEF support. In particular the project will provide significant direct assistance towards realizing the provincial government's plans to increase the terrestrial PA System from the current 8.4% to 11.79% of land area by 2025, as well as increasing mangrove areas within PAs by 25% by 2017.

3. The project will create a strong provincial system for managing the PA system and the sub-system of mangrove PAs, improving the spatial design of the PA system and bringing an additional 40,000 ha under protection, ensuring better terrestrial and coastal ecosystem representation and filling ecosystem coverage gaps. As Hainan Province is largely an island, the whole island can be regarded as a catchment system, the project therefore focuses on terrestrial wetland PAs including catchment PAs inland and mangrove PAs along the coast. This will increase the resilience of the sub-system in the face of a fast changing climate by maintaining representative samples of different forest and wetland types, with gradients in altitudes and increased connectivity between core areas. The project will improve functioning of existing and new PAs, by strengthening management effectiveness through improved monitoring and law enforcement, establishment of model buffer zones, development of co-management arrangement with community participation. Valuation of key ecosystem services and local resource use will underpin piloting of eco-compensation schemes to improve the sustainability of PA management. The project is designed to reduce threats by integrating wetland PA objectives into tourism plans and establishing standards for tourism development and operation, while also addressing other sectoral pressures notably from coastal aquaculture practices.

CONTEXT AND GLOBAL SIGNIFICANCE

Environmental and Biodiversity context

4. With an area of 3,392,000 ha, Hainan is China's smallest province, comprising some two hundred islands scattered among three archipelagos off the southern coast of mainland China. 97% of the province's land mass consists of Hainan Island (**Fig. 1**). It was separated administratively from Guangdong Province as a new province only in 1988. The province has a population of 8.7 million (2010) with rapid population growth due largely to immigration prompted by fast economic development. Hainan's economy is predominantly agricultural with the main crops including rice, coconuts, bananas and other tropical fruits; more than half of the island's exports are agricultural products. There is a large off-shore and coastal fishing and aquaculture industry, producing scallops, pearls, shrimps and fish, supporting around 100,000 families. Tourism plays an important role in Hainan's economy, owing largely to its tropical beaches and lush forests. In 2011, GDP of Hainan Province reached 251.5 billion RMB (US$39.9 billion[1]), with a GDP per capita of US$2,805. In December 2009, the government of China announced that it planned to establish Hainan as an "international tourist destination" by 2020. This announcement contributed to a surge in the province's economy, with a year-on-year increase in investment of 136.9% in the first three months of 2010[2].

FIGURE 1 MAP OF HAINAN ISLAND SHOWING MAJOR CITIES (COUNTIES) AND RIVER SYSTEMS

5. Hainan Island has mountains in the centre and southwest. Its highest peak is Wuzhishan (1,867 m). Rainfall is high in the east (2,000 mm yr^{-1}) but less so along the west coast (1,000 mm yr^{-1}) leading to a wide range of forest and woodland types from tropical rainforest to monsoon woodlands. Most of the rivers in Hainan originate in the central area of the island and flow in different directions (**Fig. 1**), making the whole island a large catchment area. There are very few natural lakes on the island. The island has 1,500 km of coast line and supports the richest mangrove forests in China (**Fig. 2**) and includes extensive marine areas of the South China Sea including the Nansha archipelago and many coral reefs.

[1] Exchange Rate of US$1 = RMB6.30
[2] Source: http://en.wikipedia.org/wiki/Hainan#Economy

FIGURE 2 DISTRIBUTION OF MAJOR MANGROVE SITES IN CHINA

6. Hainan is the only province totally located within the tropical zone in China. Owing to its high biodiversity, Hainan Island is recognized as one of China's nine biodiversity hotspots (**Table 1**[3]) and is part of the Indo-Burma global biodiversity hotspot of Conservation International.

TABLE 1. SIGNIFICANCE OF BIODIVERSITY IN HAINAN ISLAND

Group	Number of Species	As % of China	As % of World
Plants	4200	15%	1.9%
Mammals	76	18.6%	1.9%
Birds	344	29.5%	3.8%
Amphibians	37	18.8%	0.1%
Reptiles	104	33.1%	1.7%

Source: Adopted from Ouyang, Han, et al., 2001

7. The flora is estimated at more than 4,200 species, accounting for 15% of China's vascular plants (**Table 1**). Among them, more than 3,500 species are native to Hainan Island and 600 species are endemic, over 50 of which are classified as state protected endangered species including *Sindora, Arenga, Cephalotaxus sinensis, Homalium hainanensis*. 800 commercial timber species and 3,100 medicinal plants are found in Hainan. Hainan's location in the humid tropics and its tropical forest provide appropriate habitat for fungi, of which at least 438 species occur in Hainan including a large proportion of endemic species.

8. The terrestrial fauna richness is also high in Hainan. 561 species of terrestrial vertebrates are found, of which 37 species are amphibians, 104 are reptiles, 344 are birds, and 76 are mammals (**Table 1**). Of these, 32 species are endemic to Hainan and several species are important endangered mammals and birds, including the Hainan gibbon, Hainan moonrat, Hainan deer, and Hainan Partridge. For example, a

[3] Ouyang, Z., Han, Y. , Xiao, H., Wang, X., Xiao, Y., & Miao, H. (2001). Nature Reserve Network Planning of Hainan Province, China. South-South Co-operation Programme on Environmentally Sound Socio-Economic Development in the Humid Tropics Working Papers. Paris: UNESCO, Division of Ecological Sciences, South-South Co-operation Programme)

2004 survey confirmed that there were only a total of 13 Hainan gibbons remained[4]. Globally threatened species include coastal wetland species such as the Black-faced Spoonbill (Endangered) and Spoon-billed Sandpiper (Critically Endangered). The richness of invertebrates is also high in Hainan, of which 800 species are endemic. The number of insect species alone is more than 5,840, accounting for about 10% of China's insect fauna.

9. The vast ocean area surrounding Hainan Island contains a variety of marine life. The documented number of marine species is more than 3,000. Approximately 1000 species of fish are found, including more than 200 species with important commercial value. Coral reefs support the highest biodiversity on the earth, and Hainan has some 100 species of corals occupying an area of 22,217 ha, of the largest coral reef habitat in main China including the South China Sea region. Coastal biodiversity is also exceptionally rich with 90% of the mangrove species (36 species in 20 families) occurring in China, and other important coastal and marine coral habitats.

10. With a wetland area of 311,800 ha, Hainan provides breeding, staging and wintering areas for migratory waterbirds. Hainan occupies a strategic position along the East Asian–Australasian Flyway and so the diverse and extensive wetland habitats on the island are of great importance for Asian waterbird conservation. Of the 81 species of migratory waterbird listed under the China-Australia Migratory Bird Agreement (CAMBA), 35 species have been recorded within the Dongzhaigang mangroves. In addition, 75 species of migratory bird specified under the China-Japan Migratory Bird Agreement (CJMBA) have been recorded. A consecutive monitoring study during 2003-2009 recorded 83 wetland-associated birds with 74 species of waterbird in Hainan, and among them 19 species are either listed as globally Threatened or Near Threatened by IUCN (2006)[5]. Taking the Dongzhaigang mangrove reserve as an example, the documented number of bird species is 194, including 9 Class II Nationally Protected Animals for China such as Chinese Egret *Egretta eulophotes*, Black-faced Spoonbill *Platalea minor*, Eurasian Spoonbill *Platalea leucorodia,* etc.

Socio-economic context

11. Hainan is China's youngest province, which was established only in 1988. The rapid population growth has been due largely to immigration prompted by fast economic development. By 2010, the urban population had reached 3.74 million while the rural population was 45.3 million. People from various ethnic minority groups reside in the south central part of Hainan with a population of 1.4 million. Along with the Han group, the aboriginal ethnic groups Li, Miao and Hui make the culture and history of Hainan more dynamic and unique. The main ethnic minorities Li (800,000) and Miao (50,000) live in the inland mountain areas in the south western parts of Hainan.

12. Because of the tropical moist monsoonal climate, Hainan is warm with heavy rainfall all year around. The favorable climate not only brings ample sunlight, heat and water resources, but also causes serious disasters such as typhoons, droughts and floods, of which the typhoons have become the most harmful and frequent disasters in Hainan during recent decades. According to incomplete statistics, from 1988 to 2008, the number of people affected by natural disasters of Hainan was more than 86 million, and the direct economic losses were over 500 billion RMB. The frequent occurrence of natural disasters and

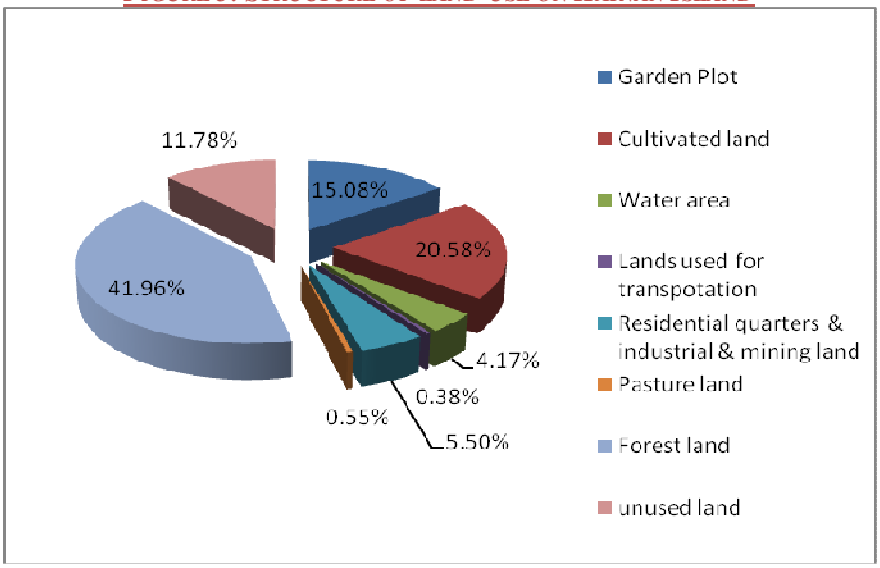
[4] Chan, B.P.L., Fellowes, J.R., Geissmann, T. and Zhang, J. (eds.). 2005. Status Survey and Conservation Action Plan for the Hainan Gibbon – VERSION I (Last Updated November2005). Kadoorie Farm & Botanic Garden Technical Report No. 3. KFBG, Hong Kong SAR, iii + 33 pp.)

[5] Guogang ZHANG, Wei LIANG, Dongping LIU, Fawen QIAN, Yunqiu HOU, Wenba SU, Kilburn Mike, Holmes Jemi, Kwok Shing Lee. 2010. Species abundance and conservation of coastal wintering waterbirds in Hainan Island, China. Chinese Birds 1: 204–210

the wide range of related impacts have seriously affected the economic and social development of Hainan Province.

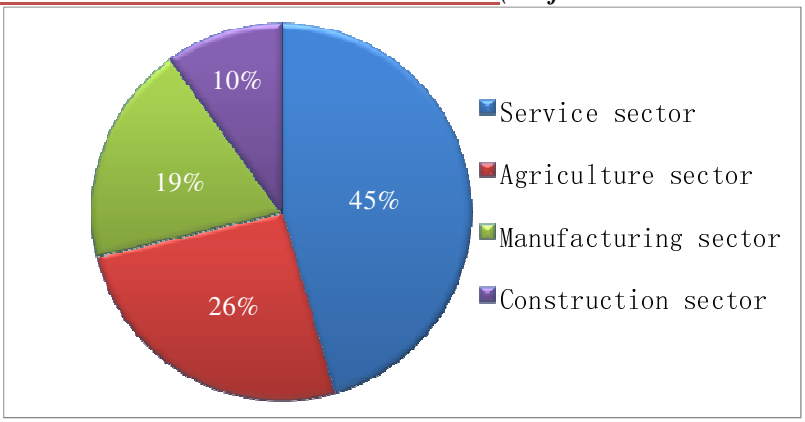
13. In Hainan, forested land covers the largest area, accounting for 42% of the total land area, followed by cultivated land and garden plots together covering 36% of total area, indicating that agriculture is very important component (**Fig. 3**).

FIGURE 3: STRUCTURE OF LAND-USE ON HAINAN ISLAND



14. Being China's largest Special Economic Zone, the GDP of Hainan Province has been increasing steadily and reached 251.5 billion RMB in 2011. Hainan's pillar industries include agriculture, tourism, petrochemical industry, electronics & information, and marine bio-pharmaceutical industry. Owing to its southern tropical location, Hainan has always had a reputation as a "Big Greenhouse", where a diversity of crops including rice, coconuts and other tropical fruits are cultivated. More than half of the island's exports are agricultural products. The coastal fishing and aquaculture industry supplies large amount of scallops, pearls, shrimps, tilapia and other seafoods. While the agricultural sector (including aquaculture) contributed still 26% of the GDP of Hainan Province, the service sector became the largest portion of Hainan's GDP in 2011 (**Fig. 4**). The revenue from the tourism industry is increasing and its contribution to the service sector GDP jumps during recent years as a result of China central government decision in 2009 to establish Hainan as an official international tourism destination.

FIGURE 4: HAINAN GDP DISTRIBUTION FOR THE YEAR 2011 (% of 251.5 billion RMB or US$40 billion)



15. With the boom in nature-based tourism in recent years, Hainan has attracted numerous tourists to visit its beautiful beaches, lush tropical rainforests and unique mangroves. In 2011, more than 30 million visitors thronged to Hainan, which brought 5.2 billion USD revenue to the province. The protected area system encompassing nature reserves, wetland parks and forest parks hosted more than 5 million tourists in 2010, accounting for almost 20% of total tourists that year[6]. On Hainan Island, Haikou City and Wenchang City have the largest areas of mangrove wetlands. The mangroves of Dongzhaigang are a famous tourist attraction, while the mangroves located in Qinglangang are the most diverse in China. The mangroves not only provide the foundation for the fisheries, but also provide tourism opportunities for the two cities. Haikou lies in the north of Hainan (Fig. 1), with a population of 2.04 million and 2,305 km of coastlines. Wenchang is also located in the northeastern part of Hainan (Fig. 1), and covers an area of 240,300 ha with 206.7 km of coastline and 8,963 ha of intertidal land.

16. Haikou is the most prosperous city in Hainan with mangrove resources (Table 2), whose GDP reached RMB 59 billion in 2010, with a GDP per capita of RMB 28,860. Following Haikou is Danzhou, then Sanya and Wenchang City, with the fourth highest 2010 GDP. Other cities or counties with nature mangroves have much smaller GDP than these cities or counties (**Table 2**).

TABLE 2 STATISTICS OF POPULATION SIZE AND GDP PER CAPITA IN THE CITIES/COUNTIES OF HAINAN WITH MANGROVE RESOURCES IN 2007

City/County	GDP[8] (billion RMB)	Population Size[9]	GDP per capita (RMB)
Haikou	59,055	2,046,189	28,860.97
Wenchang	11,450	537,428	21,305.18
Sanya	23,079	685,408	33,671.92
Dongfang	7,581	408,309	18,566.82
Danzhou	29,275	932,362	31,398.75
Lingao	6,963	427,873	16,273.52
Chengmai	10,600	467,161	22,690.25

Protected area system: Current status and coverage

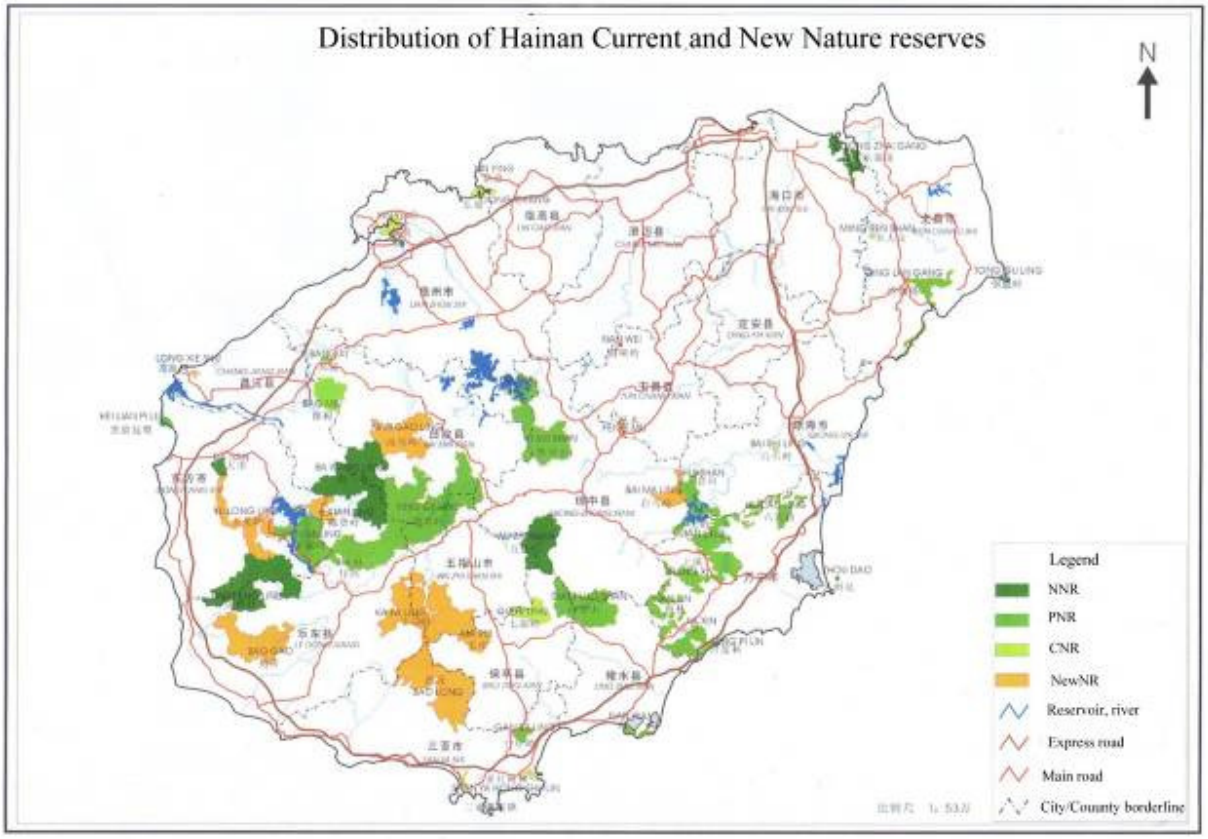
17. In order to conserve biodiversity and ecological functions of unique ecosystems, Hainan has established a network of PAs comprising nature reserves, wetland parks and forest parks. See the Policy and Legislative Context section for further information on these different systems. The PA system in Hainan Province only covers 8.4% of the terrestrial areas, comprising mostly small NRs are less than 10,000 ha. Existing reserves generally suffer from chronic underfunding for operational management needs, impacting their ability to undertake basic conservation management duties such as patrolling, monitoring and enforcement. This is most acute in the smaller county or city nature reserves that depend on local government for financing. The 2011 review of Hainan's PA system concluded that the present PA coverage was geographically biased toward its central mountainous areas with higher elevations, rugged terrain, and infertile soils. Under-protected lowlands and coastal areas tended to have higher animal species richness, and the nature reserve coverage was not enough to capture lowlands biodiversity features.

18. As the dominant component of Hainan's PA system, nature reserve (NRs) sub-system comprises 9 National Nature Reserves (NNRs), 24 Provincial Nature Reserves (PNRs) and 39 County or county

[6] http://blog.caijing.com.cn/expert_article-151635-41521.shtml
[7] At 31 December 2010, the exchange rate was US$1 = RMB 6.60; source; www.oanda.com
[8] http://www.tianya.cn
[9] http//dingan.Hinews.cn

level Nature Reserves (CNRs) (**Fig. 5, Annex 4**). Among them, there are 64 terrestrial nature reserves and 8 marine nature reserves. The terrestrial PAs cover an area of 285,600 ha, accounting for approximately 8.4% of the Hainan's land area. Despite great efforts from various governmental agencies and local stakeholders, there remain many gaps and challenges in maintaining and sustaining Hainan's PAs. Inadequate representativeness of the current PAs cannot provide safeguard for some vegetation types, e.g., tropical limestone forest, tropical evergreen lowland forest, etc. Also, less than 13% of Hainan's NRs are NNRs, and their areas also are smaller than the average for China. Many NRs are short of involvement by local communities and other stakeholders into general management. At the same time, insufficient funds for building infrastructure, undertaking research, creating tourist facilities and conducting public education are very common in many nature reserves.

FIGURE 5 MAP OF NATIONAL AND PROVINCIAL NATURE RESERVES ON HAINAN ISLAND



19. These PAs were established under the Hainan Provincial Regulations on Nature Reserves (1999) in line with the Regulations on Nature Reserves in China (1994) and are administered by the Hainan Forestry Department (HFD), Hainan Marine and Fisheries Department (HMFD) and Hainan Land Environment and Resources Department (HLERD), which report to the People's Government of Hainan Province and their respective corresponding administrative authorities in Beijing for technical guidance.

20. In general, the establishment of all NNRs must be approved by the State Council and they are generally allocated with higher levels of funding and staffing. The designation of NNR status allows the PA to access funding resources from the central government (as well as provincial and local governments) for its management. Any park infrastructure development work planned inside NNRs requires central government permission. Central government funding is limited and usually only available for reserve 'development' or for specific 'projects'. The burden of additional construction and on-going (regular) operations falls primarily on local sources. Indeed, local government plays an important role in

administrating NNRs since they have the right to determine staffing level and operational funds while SFA and its counterparts at the state level are mainly responsible for technical assistance and governance. Other relevant resource sectors, e.g., water resources, agriculture, ocean and fishery, etc. might also take responsibilities of NNRs for resources management given the overlapping of jurisdiction of different governmental sectors.

21. The provincial government can make legislation and its own special management arrangements for provincial PAs but there are no differences between NNRs and PNRs in terms of permissible land and resource use inside such areas. Currently, Hainan Provincial Regulations on Nature Reserves (1999) is the specific provincial level law for PA management in Hainan Province. In addition, Hainan issued Regulations on Mangrove Protection in Hainan Province enacted in 1998, 1st revision in 2004 and 2nd revision in 2011.

22. In order to conserve ecological processes and wildlife biodiversity of NRs, Hainan Province has a clear policy about developing its PA system. According to the Natural Reserve System Developing Program (1999) and Hainan Ecological Province Construction Program (1999), there are three steps for extending the PA system in Hainan Province. Firstly, determine the boundaries or management structure of county level NRs. Then extend Bawangling NNR, new Nanxi PNR and Wangxia exhibition center/museum. Secondly, in order to develop the PA system in Hainan, newly or expanded nature reserves and exhibition centers/museums will be built, including Wuzhishan, Diaoluoshan, Daguangba, Limushan, Yinggeling and Limushan-Yinggeling gallery. Thirdly, after the development of newly and expanded NRs and exhibition centers/museums, Hainan will have a relatively completed PA system and the land cover will reach 11.79% of total land area in Hainan Province. Even including newly established forest parks and wetland parks, this falls short of global expectations for national PA system targets, if applied across provinces. CBD Aichi Target 11 states that “By 2020, at least 17 per cent of terrestrial and inland water areas, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed”. The Hainan Bureau of Land Environment and Resources has just completed a master plan for Hainan future PA expansion by partnership with HFD and HMFD, which is waiting for revision and approval by Hainan People Government. Within this master plan, HFD will be responsible for establishing several new forest and wetland PAs (see baseline section for further information).

23. According to the Regulations on Nature Reserves (1994) and following IUCN’s zonation standards for nature reserves, all Chinese nature reserves can have three management zones: core zone, buffer zone and experimental zone. The aim of the zonation is to prevent negative impacts on natural resources and ecosystems. The detailed purposes and management prescriptions are decribed as follows (**Table 3**).

TABLE 3 DETAILED DESCRIPTIONS OF THREE FUNCTIONAL ZONES OF HAINAN'S NATURE RESERVES

Management Zone	Purpose	Management Prescriptions
Core zone	To protect intact ecosystems where rare and endangered animals and plants are concentrated	▪ No entry, except with special permission for scientific studies. ▪ If necessary, people living inside need to be resettled. ▪ Construction of production facilities is prohibited.
Buffer zone[10]	Area surrounding the core zone	▪ No tourism, production or trading activities. ▪ Entry permitted on special permission for non-destructive research, collection, and educational purposes ▪ Construction of production facilities is prohibited.
Experimental zone	Area surrounding the buffer zone	▪ Visiting and tourist activities allowed with special permission. ▪ Tourism promotion should not damage or pollute original landforms and scenery. ▪ Visiting and tourist projects that violate the general guidelines of NRs are prohibited ▪ Construction of production facilities that may pollute the environment or damage the natural resources or landscapes are prohibited. ▪ Existing facilities are required to reduce and control pollution discharge to within prescribed standards.

24. The ecosystem services of PAs in Hainan (See **Table 4**) include (1) **Water conservation**: Plain and alpine regions in southern Hainan Island are extremely important areas for water conservation service. Low mountains and hilly areas in the middle of southern Hainan Island are also important areas for water conservation service. The imperative and important areas are 649,810 ha and 414,700 ha, respectively, accounting about 19% and 2% of the island total area; (2) **Water resource protection**: Water supply source of the main cities and development zones, such as Haikou, Sanya and Yangpu and their surrounding forest are extremely important areas for water resources protection. Important areas are small and medium-sized urban water supply sources, such as Sanya red field reservoir, Shapo reservoirs of Haikou City, Yongzhuang reservoir and Huangbizhuang reservoir in Danzhou City and their surrounding water conservation forests. The imperative and important area are 81,600 ha and 34,500 ha, respectively, together accounting only 3.5% of total land area of the island; (3) **Soil conservation**: Extremely important areas are the central mountains such as Wuzhshan, Limuling, Bawangling, Majueling, DiaoLuo Mountain and so on, which cover an area of 109,000 ha. Mountainous areas in the middle and west cities are important regions such as Jianfengling, Qiongzhong, Wuzhishan, Ledong, LingShui and northern Sanya City, east of the Chengjing, east of Dongfang and the west of WanNing, which account a total area of 239,500 ha. The extremely important area and important area for soil conservation account for the 3% and 7% of the island land area, respectively; (4) **Coastal zone protection**: The most important areas for coastal protection include the mangrove forests of Dongzhaigang and Qinglangang nature reserves, shelter forests along the coastlines, and natural forests of Haikou, Wenchang, Qionghai, and WanNing. The important areas include the beach areas for swimming, the coastal zone used for agricultural activities, and the coastal zone used for industrial project and construction of city; (5) **Biodiversity conservation**: The most important areas for biodiversity protection mainly lie in the southern mountainous area, such as Limushan, Wuzhishan, Diaoluoshan, Bawangling and Jianfengling nature reserves, covering a

[10] Note: Here the term Buffer Zone is used in the context of the Chinese Nature Reserve Regulations. This is more restrictive than wider international usage of the term, e.g. as used in the case of UNESCO's Biosphere Reserves, as used elsewhere in this document.

concentrated distribution of natural forest in lowland and montane regions, accounting for a land area of 10. 6% and containing 44.7% of important species habitat area. Overall, the most important areas for the above ecosystem services include the middle and south parts of the mountain forest ecosystem areas and the coastal zones where mangrove ecosystems occur, covering an area of about 956,100 ha or 28% of the island land area. Other important regions lie outside the above-mentioned priority areas, covering an area of 580,000 ha or 17% of total island area; (6) **Ecosystem services**: The most important areas for ecosystem services are the forest ecosystems in the central south and the mangrove ecosystems along the coastlines, with a total area of 956,160 ha or 28.2% of total land area. The next important areas are those surrounding the above forest and mangrove ecosystems, which cover an area of 579,990 ha or 17.1% of total land area.

TABLE 4. AREA AND PROPORTION OF HAINAN'S PAS ACCORDING TO THEIR ECOSYSTEM SERVICES IN DIFFERENT IMPORTANCE RANKS

生态系统服务类型 Types of ecosystem services	极重要 Extremely important		重要 Important		中等重要 Median important		一般重要 General important	
	面积 Area /km²	比例 Proportion /%	面积 Area /km²	比例 Proportion /%	面积 Area /km²	比例 Proportion /%	面积 Area /km²	比例 Proportion /%
水源涵养 Water conservation	6498.1	19.1	4146.7	12.2	12606.4	37.1	10705.4	31.5
水资源保护 Water resource protection	861.2	2.5	344.6	1.0	0.0	0.0	32750.8	96.5
土壤保持 Soil conservation	1091.2	3.2	2394.6	7.1	11081.1	32.7	19333.2	57.0
海岸带防护 Littoral zone protection	20.9	0.1	14.7	0.0	44.4	0.1	33876.7	99.8
生物多样性 Biodiversity conservation	5441.4	16.0	1871.5	5.5	5064.8	14.9	21578.9	63.6
生态系统服务 Ecosystem services	9561.3	28.2	5799.9	17.1	11441.9	33.8	7097.0	79.1

Source: Xiao Y，Chen S B，Zhang L，Yue P，Ouyang Z Y，Liu X C Designing nature reserve systems in Hainan Island based on ecosystem services. Acta Ecologica Sinica， 2011，31: 7357-7369

Institutional context

25. The main agency managing PAs in Hainan Province is the Hainan Forestry Department (HFD). It manages 9 NNRs such as Dongzhaigang Mangrove NNR, Datian NNR, 23 PNRs, including Qinglangang Mangrove NNR, Dongfang Black-faced Spoonbill PNR, and 18 CNR such as Sanya Mangrove NR, Linggao Xinying Mangrove NR, etc. (See **Annex 4** for site profiles). This department has dual reporting duties both to the provincial government and also to the State Forestry Administration (SFA) in Beijing. The main division of HFD responsible for Hainan's PAs management is Bureau of Hainan Wild Animal and Plant Conservation, which currently has 7 fulltime staff members.

26. The Hainan Marine and Fisheries Department (HMFD) is the local agent of the State Ocean Administration (SOA), who manages Sanya Coral Reefs NNR, Dazhoudao Ocean Ecology NNR and 6 PNRs. The Hainan Land Environment and Resources Department (HLERD) manages just 1 NNR (Tongguling NNR).

27. The CNRs are managed by the local forestry, environmental and ocean bureaus respectively. Each NR has a management bureau which is responsible for developing master plans for the development of the site, focusing in particular on securing budgets for development, staff (full-time and hired), operations and other projects.

28. Most NR management bureaus are based in the largest related county town. Each NR bureau posts field staff in field offices (at county or sometimes village level). Dongzhaigang Nature Reserve Bureau, for example, has established three Protection Stations at Sanjiang, Tashi and Daoxue. In collaboration with the Research Institute of Tropical Forestry of the Chinese Academy of Forestry, Dongzhaigang NR Bureau also established a long-term wetland ecosystem research station for studying mangrove ecosystem structure, function and processes. As this project is developing, Tsinghua University (one of the best university in China) is building a new ecological research station near Tashi station of Dongzhaigang NNR to study mangrove-climate interactions.

29. The capacity of these agencies to manage Hainan's PA system has been assessed using the UNDP Capacity Development scorecard (see **Annex 2**), while the baseline METT for the targeted mangrove PAs (see **Annex 1**) included assessment of staff capacity for the individual PAs. At both PA system and individual PA levels, shortfalls in staffing capacity were evident. For instance, at PA system level, skills exist but in largely insufficient quantities to guarantee effective planning and management; and due to lack of coordination and cooperation among PA management authorities, it is difficult for them to attain certain skills. Staffing was reported to be insufficient, in particular lack of professional employees, which greatly hampers the management effectiveness of PAs. At individual PA level, the number of staff for all sites was inadequate with the exception of Dongzhaigang NNR, and the level of training and skills was low for all sites (see **Table 5**).

TABLE 5. STAFFING CAPACITY OF MANGROVE PROTECTED AREAS IN HAINAN

Mangrove Site	Protection Level	Area (ha)	Number of Staff	Capacity
Dongzhaigang	NNR	3,337	45 (+6 temporary)	Adequate no. staff; low level of training & skills
Qinglangang	PNR	2,905	14 (+14 temp)	Inadequate no. staff; low level of training & skills
Dongfang	PNR	1,429	4 (+ 3 temp)	Inadequate no. staff; low level of training & skills
Huachangwan	County NR	150	2	Inadequate no. staff; low level of training & skills
Xinying	NWP	507	2 (+6 temp)	Inadequate no. staff; no training & low skill levels
Sanya	CNR	728	4 (+7 temp)	Inadequate no. staff; low level of training & skills
Xinyingwan	City NR	115	1	Inadequate no. staff; no training & low skill levels

Policy and Legislative context

30. All nature reserves in China are established under the administrative rule 'Regulations of the People's Republic of China on Nature Reserves' (1994). To date, no consensus has been reached concerning new legislation on wetland protection even though it was proposed several years ago. This has resulted in a situation whereby the forestry department, oceanic affairs department and other state departments operate their conservation areas as they see fit, without uniform criteria for wetland PA establishment, management standards or operational guidelines. For example, although most mangrove nature reserves are administered by State Forestry Administration or its local branches, there are still several national or provincial mangrove nature reserves which were established and are being managed by the State Oceanic Administration or its provincial bureaus. This lack of legislative harmony hinders effective management of the PA system.

31. The 'Regulations of the People's Republic of China on Nature Reserves' allows for only one PA category (Nature Reserves). These can be established for three main objectives – wildlife protection, ecosystem protection or natural monument protection. In 2010, State Forestry Administration issued a temporary regulation on National Wetland Parks, which is still in revision based on the feedback received so far. In 2011, SFA also issued a regulation on National Forest Parks.

32. These Regulations are very restrictive and rarely match actual land-use patterns on the ground. For a nature reserve, three zones are permitted: 1) the core zone with no use, habitation or interference permitted, apart from limited observational scientific research; 2) the buffer zone, where some scientific collection, measurements, management and research are permitted; and 3) the experimental zone, where scientific investigation, public education, tourism and raising of rare and endangered wild species are permitted. An external protection zone (which is a buffer zone in the usual international meaning of that term) may also exist, where the normal range of human activity is allowed, with restrictions only if those activities have damaging effects inside the NR.

33. All three zones would fall under the definition of strict nature reserve (1a) of IUCN's classification of PA categories (Table 3). None of the zones, according to IUCN's classification, would allow even sustainable extraction of natural resources such as firewood, fishing or grazing, game hunting, medicinal plants. The current boundaries and zones of the NNRs are thus in contradiction with set regulations, inasmuch as townships, aquaculture, fishing, small agricultural plots, fences and domestic grazing are present or occur across all three management zones for some (but not all) NNRs.

34. The legal aspect of animal and plant protection is highly relevant to biodiversity conservation. China has at least 25 regulations and 4 laws in this regard, administered by multiple departments in a loose manner. The forestry department is responsible for the implementation of laws on wildlife protection, while the departments of agriculture, customs, commerce and public security are responsible for the rest. There are separate national laws regarding wild animals and plants: the wild animal protection only focuses on the conservation of species but neglects habitat protection, while biodiversity conservation stresses the protection of ecosystem integrity. The decentralized management model is fundamentally inconsistent with requirements for the integrated protection of biodiversity in China.

35. This gap in national legislation and coordination can potentially be compensated for by local legislation. Provinces can enact local regulations tailored to specific needs that do not contradict national legislation. For example, the 4th People's Congress Assembly of Hainan Province ratified the Regulation on Mangrove Protection in Hainan on July 22, 2011. This regulation must be observed along with the 'Regulations of the People's Republic of China on Nature Reserves, and the temporary regulation on National Wetland Parks and the regulation on National Forest Parks.

36. Careful reviews of the existing regulations point out that, although these regulations call for the protection of important wildlife, natural resources and habitats in PAs, they make no allowance for community involvement in planning or management of PAs, provide very loose control or regulation of eco-tourism development in PAs, make no reference to control alien invasive species in or around PAs, and also make no reference to mitigate adverse impacts of climate change on PAs.

37. According to the 12th Five-Year Plan of Hainan Economic and Social Development (2011), Hainan will build an ecological province with environmental protection and harmonized green development as top priorities. The goal is to ensure forest coverage at the highest level of the nation and to build Hainan as a "four-season garden for the whole nation's citizens". To do so, ecological protection and disaster relief systems will be strengthened, including stronger investments on existing national and provincial NRs, establishment of several national or provincial wetland parks, forest parks, and NRs. In

the next 5 years, the coverage of natural forests should be maintained at 18%, while the total forest coverage should be kept at 60% or higher.

38. In the 12th Five-Year Development Plan for Forestry in Hainan, the whole of Hainan Island is considered as an independent and integrated forest ecosystem for planning and development. The ultimate goal is to present Hainan Island as a "green island" with the boost of economic development underpinned by healthy ecosystems. To achieve this, the forestry development strategy centers on ecological development by promoting forestry development and setting up forest-based tourism as a new impetus to advance the development of modern forestry in Hainan. The development objective for the PA system under this Plan is as follows: *By 2015, Hainan Province will establish a batch of new national and provincial nature reserves and further consolidate the management of existing nature reserves to improve the ecological health within reserves in Hainan. As a result, 88% of state key conservation wild flora and fauna, 67% higher plant and their communities, and 92% typical terrestrial ecosystems are well conserved in nature reserves, forest parks and wetland parks by 2015.*

39. The third key project on environmental conservation and ecological development highlighted in the 12th Five-Year Development Plan is *Ecological Development Project: To continue to increase and conserve coastal defense forest, natural forests, and shelter forests along the coastline, road and urban; returning agricultural lands to forests, conserve biodiversity, key functional zones and nature reserves*. Accordingly, the approved 12th Five-Year Development Plan for Haikou City highlights improving the effective management of Dongzhaigang NNR, including capacity development. In addition, Haikou City will conduct wetland protection and restoration by establishing Hainan Dongzhaigang National Wetland Park, Haikou Nandujiang Estuary Provincial Wetland Park and Haikou Baishuitang City-level Wetland Park.

40. According to Hainan's 2010-2020 Development Plan for International Tourism Island (2010), a group of new NRs and forest parks will be established by 2015 in addition to better management of existing NRs and forest parks. Furthermore, wetland ecological restoration projects will be implemented and the management of wetland NRs and wetland parks will be strengthened.

41. However, there still exist many problems in the development and management of nature reserves which cannot meet the need for protecting biodiversity and ecosystem service functions. The main problems are: (1) the rate of protection area is relatively low and insufficient. According to 2010 statistical data, the terrestrial nature reserve area in Hainan (excluding wetland and forest parks) accounted for only 7.1% of the total land area of Hainan Province[11], which is below the national average of 15.1%. In some regions of important ecological systems and rich in species diversity, there are still no nature reserves; (2) the conflicts between conservation and development are still very sharp; (3) the area of most nature reserves (especially mangrove reserves) is small. According to 2010 statistics, the average area of Hainan NRs was only 5,700.6 ha, and the area of the biggest NR was only 50,464 ha; (4) some nature reserves were established without following the IUCN standards on nature reserves so the capacity of their management is relatively low; (5) some nature reserves are in serious shortage of funds; and (6) scientific research on the background of some nature reserves is not sufficient. The baseline assessment of management effectiveness for the mangrove PAs is given in **Annex 1**.

[11] Xiao Y, Chen S B, Zhang L Yue P, Ouyang Z Y, Liu X C. Designing nature reserve systems in Hainan Island based on ecosystem services. Acta Ecologica Sinica, 2011, 31(24) : 7357-7369.

THREATS, ROOT CAUSES AND IMPACTS

42. Hainan Island has the largest area of tropical rainforest, mature mangrove and almost all coral reef resources of China. Due to the extreme abundance in biodiversity, Hainan Island has become the one of the most valuable and potential areas for biodiversity conservation in China. However, the globally significant ecosystems of Hainan Island are fragile. Their constituent flora and fauna are under increasing threats from a number of factors, as explained below.

43. **Land use change**. Hainan was once almost totally forested but became heavily degraded as a result of logging, clearing of land for agriculture and rubber plantations. Conversion of natural forest for plantations has been significant, with pulp plantation replacing the natural forests on mid and high elevations and steep slopes, and rubber plantation replacing natural forests at lower elevation, including encroachment of both types into catchment protected areas[12]. Large areas of mangrove have been converted for aquaculture ponds. Present natural forest cover in Hainan is estimated at around 20%. With the loss of forest cover, ecosystem functions for water catchment have also been degraded. The loss of upstream catchment forest and conversion to agriculture has resulted in changes in water flow and quality as well as microclimate and fragmentation of terrestrial habitats within the remaining 20% of original forest cover. For example, a recent study by Zhang et al. (2010)[13] showed that, during the 17 year period between 1991-2008, the area of forests suitable for the rare Hainan gibbon decreased by 54,000 ha (35%) across Hainan Island, and by 630 ha (7%) in the locality of the single gibbon population at Bawangling National Nature Reserve. Suitable forests were mainly replaced by plantations below 760 m above sea level, or degraded by logging, grazing, and planting of pine trees above 760 m. These forest changes have threatened the gibbon population in Hainan.

44. **Habitat fragmentation**: Following the rapid development of Hainan's International Tourism Island Master Plan (HITIMP) approved in 2010, numerous physical infrastructure projects such as urban river renovation, highway systems and tourism facilities, have been launched without adequate coordination with PA authorities and sometimes without consideration of environmental impacts. This pattern of development poses significant threats to the ecosystem services and biodiversity of coastal ecosystems through direct impacts including the erosion and disturbance of local mangroves, water diversion from important wetlands and deforestation, as well as indirect threats (e.g. increasing access to resources within PAs, and increasing markets for unsustainably and/or illegally harvested products). Reclamation works often lead to huge impacts on biodiversity through destroying marine habitats, reducing water exchange in estuaries and reducing the area of natural wetlands. For example, in the 1970s, nearly half of China's mangrove area was lost due to reclamation, including the direct loss of significant wetland resources in Dongzhaigang. More recently, coastal development around Sanya has put severe pressure on remaining mangrove habitats. Many ecosystems such as mangroves, intertidal flats, bays, and coral reefs face severe threats of fragmentation, degradation and loss, which lead to species loss and destruction in ecosystem diversity. In addition, sea wall concrete constructions for storm protection caused serious changes in the coastal processes and natural coastal landforms of mangroves and mud flats. The lack of a buffer zone between marine and terrestrial ecosystems in reclamation schemes limits the exchange of matter, energy and information between them, thereby affecting their ability to be self-sustaining.

45. **Overexploitation of natural resources and overfishing:** Hainan is abundant in **biological resources.** However, many species of natural reserves have been decreasing steadily due to unplanned,

[12] Zhai DL, Cannon CH, Slik JW, Zhang CP & Dai ZC. Rubber and pulp plantations represent a double threat to Hainan's natural tropical forests. J. Env. Management 96 (2012) 64e73.

[13] Zhang MX, Fellowes JR, Jiang XR, et al. (2010). Degradation of tropical forest in Hainan, China, 1991-2008: conservation implication for Hainan gibbon (*Nomascus hainansus*). Conservation Biology 143: 1397-1404.

uncontrolled exploitation and the lack of appropriate protection. Deforestation has led to a reduction in forest area, destroying, degrading and fragmenting habitats for wild animals and plants and diminishing ecosystem services. Poaching of wildlife has also led to rapid population declines of some species, such as the Hainan Black-crowned Gibbon and Hainan Thamin Deer (Eld's Deer) and a recent study of rural bird hunting indicated existing severe pressure[14]. Evidence of continued poaching at Bawangling NNR, with both guns and traps, was encountered throughout a recent survey, and hunting remains a major ongoing threat to wild animals in BNNR[15]. Since 1950s, 80% to 90% of coral reefs in the Hainan Island waters have been destroyed, with the deterioration and degeneration of offshore coral reefs most severe. Sanya has attracted large numbers of tourists around the world, with its unique geographical conditions and the colourful underwater coral reefs. However, with poor management and planning, and increasing population and economic development the coral reefs in Sanya are being destroyed. The coverage of coral reefs along Luhuitou declined to 22% in 2002 from 40% in 1998-1999, while the bleaching rate of coral reefs in west tourism area of Yalongwan (Peninsula Dragon Bay) reaches 70% in recent years, due to human activities. Daily intrusions into NRs by the local inhabitants are causing serious over-fishing, over-harvesting and resulting disturbance to ecosystems and biodiversity (especially water birds). In recent years, fishing intensity has significantly increased driven by market demand, which, when combined with environmental deterioration, has led to a sharp decline in seafood species, some of which are approaching extinction. Especially around the mangroves, a large number of fishermen carry out fishing with small mesh nets, which undermines the sustainable development of marine resources. Therefore, it is necessary to guide marine fishing methods, and to encourage the coastal aquaculture and fishing industry. For example at Qinglangang PNR, the site experiences intensive human-induced pressure from local communities, including fishing, aquaculture and burgeoning tourism. Overfishing, pollution from domestic sewage and aquaculture jointly and increasingly jeopardize the diverse but fragile mangrove forest with the increase of population.

46. **Alien species invasions:** Biological invasions are a global problem, another severe threat to biodiversity. Hainan Island is one of China's most seriously affected zones in terms of biological invasions. There are more than 160 exotic pest species, causing serious economic losses to Hainan. *Eupatorium odoratum* Linnaeus, *Eupatorium catarium* Veldkamp etc. can be found everywhere in Hainan including forest edge, wilderness, wasteland, roadside. And *water hyacinth* and *Achatina fulica* also have caused water damage. *Sonneratia apetala,* which was introduced to Dongzhaigang NNR in 1985 from Bangladesh, grew rapidly, covered hundreds of hectares of beach, and then produced severe competition for other mangrove species. Though it has not yet caused biological invasions to Dongzhaigang mangroves, ecological monitoring needs to be strengthened due to its strong ability for interspecific competition. The most economic way to control the invasion of alien species is prevention rather than cure, through improved regulation. Currently no regulations address this issue, and low awareness of the significance of AIS impacts combined with increasing exposure to tourism, agriculture and aquaculture development pose increasing risks for Hainan. The continuing use of *S. apetala* and *Laguncularia racemosa* in mangrove replanting and many exotic species such as *Casuarina* and *Melaleuca* in coastal green belt development is indicative of this problem.

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[14] WEI L, YAN C and YANG CC. 2011. Extreme levels of hunting of birds in a remote village of Hainan Island, China. Bird Conservation International. Bird Conservation International / *FirstView* Article, pp 1-8.

DOI: http://dx.doi.org/10.1017/S0959270911000499 (About DOI), Published online: 16 December 2011

[15] Chan BPL, Fellowes JR., Geissmann T and Zhang J (eds.). 2005. *Status Survey and Conservation Action Plan for the Hainan Gibbon – VERSION I* (Last Updated November 2005). Kadoorie Farm & Botanic Garden Technical Report No. 3. KFBG, Hong Kong SAR, iii + 33 pp.

47. **Environmental pollution**: As economic development and technology advances, the total emissions of municipal and industrial wastewater as well as atmospheric emissions continue to increase. However, most wastewater is directly discharged into the sea without any treatment, resulting in serious damage to the marine ecosystem. In addition, almost every bay/inlet has suffered varying degrees of damage due to construction related to Hainan International Tourism Island. Some local governments have encouraged pond culture around the mangroves in order to develop the economy, often resulting in a large amount of sewage from fish and shrimp ponds being discharged into mangrove tidal creeks, for example at Dongzhaigang, Qinglangang and Xinying. The amount of sewage is beyond the self-purification capacity of mangroves, so that the water quality and soil around the mangroves is seriously contaminated, leading to a decline the diversity and abundance of molluscs. At the same time, since the resident population density surrounding the mangrove is high, a lot of garbage is dumped into the sea, floating together in the mangroves along the tide. In addition, eutrophication caused by coastal aquaculture and agricultural runoff can easily lead to the occurrence of red tides. The use of pesticides and other chemicals in these industries also contribute to pollution problems, along with risks of oil pollution from shipping. Hainan's marine environmental pollution is becoming increasingly serious, causing the deterioration of marine biological resources and the ecological environment, as well as threatening tourism interests.

48. **Climate change and sea level rise**: A new threat to Hainan's biodiversity is the rising sea level and increasing frequency of typhoons associated with climate change. The frequency of typhoons hitting the southern China coastline has doubled in the past 30 years, and Hainan has just been hit by two major ones in July and September 2012 successively, resulting in deaths and massive evacuation. During the period 1950-2000, the annual mean temperature increased about 0.7° C owing to temperature increase in winter (January). The annual rainfall changed less while the probability of drought increased. The annual mean wind speed and the number of landing tropical cyclones are cut down but the time for cyclone influence prolonged in recent 50 years[16]. However, although frequencies of tropical cyclone landfall for the mainland, Hainan, Taiwan and the whole China all showed to different extents decreasing trends during the past 54 years, only the decreasing trend of land falling tropical cyclones for Hainan is significant[17]. In addition, the sea level along China's coastline has maintained a rapidly rising speed over the past five decades according to the latest observations from domestic tide stations. The elevation even accelerated in recent years with an annual increase of 2.6 mm, and meteorologists predict that in the next 30 years, the sea level will continue to rise by 16 cm. By 2050, it will be six to 26 cm higher and the increase will probably reach 30 to 70 cm by the end of the 21st century. Without doubt, such sea level rise will seriously affect Hainan PA system especially those coastal NRs such as Dongzhaigan mangrove NNR, Qinglangang mangrove PNR, Dongfang spoonbill PNR, etc.

49. These climate-related changes are likely to affect the growth and distribution of coastal vegetation including mangroves and even the ecological balance. Such changes may seriously endanger mangrove reserves and cause shifts in the zoning of different mangrove formations, as well as affecting the behaviour of migratory shorebirds. With an increase in the frequency of extreme weather events, the ecosystem capacity for water retention and soil protection in catchment areas becomes increasingly important in reducing the impacts of such events.

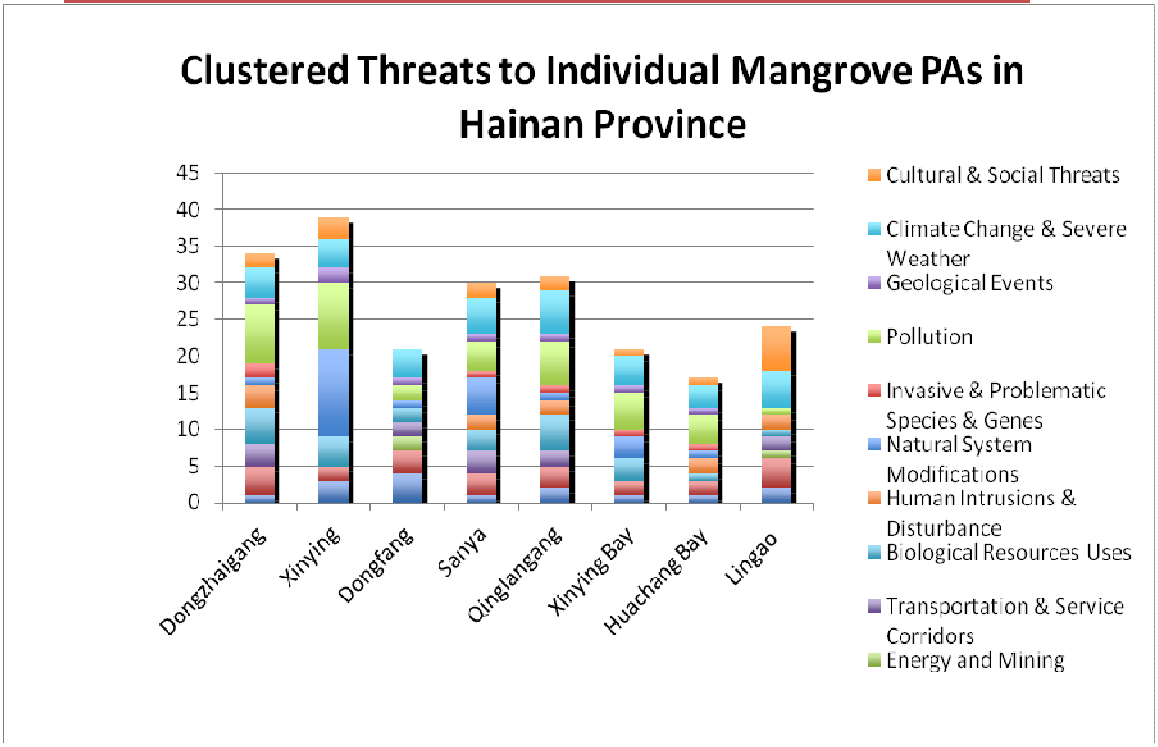
50. Underlying these threats is a general low level of awareness of the huge value of forest, wetland and marine ecosystem services, underpinning the province's economy, providing protection from natural disasters and contributing to social wellbeing and health. This is compounded by the lack of opportunity

[16] He Chunsheng, 2004, Chinese Journal of Tropical Agriculture, 24:19-24.
[17] Ren Fumin, Wang Xiaoling, Chen Lianshou, Wang Yongmei. 2008. Tropical cyclones landfalling in the mainland, Hainan and Taiwan of China and their interrelations. Acta Meteorologica Sinica, 66: 224 - 235

to include natural resource values in decision-making processes, and the general lack of consideration of biodiversity concerns in economic development and sectoral planning. Hainan's extremely rapid rate of growth spurred by its status as China's largest Special Economic Zone, and the fast rate of tourism development related to the central Government's plan to establish Hainan as an "international tourist destination" in December 2009, have intensified pressures on remaining natural forests and wetlands. The limited inter-sectoral cooperation, relatively weak capacity of the agencies responsible for PA system management and limited budgets for operational management directed towards achieving conservation objectives, plus the fact that many threats to PAs are external in nature, makes it hard for the responsible agencies to respond to these issues.

51. The range of threats affecting individual mangrove PAs (as determined in the METT in **Annex 1**) is illustrated in **Fig. 6** below.

FIGURE 6. CLUSTERED THREATS TO INDIVIDUAL MANGROVE PAS IN HAINAN PROVINCE



LONG-TERM SOLUTION AND BARRIERS TO ACHIEVING THE SOLUTION

52. The long-term solution that this project proposes to safeguard the wetland biodiversity in Hainan is to strengthen the PA network in the Province through enhanced management effectiveness, improved financial sustainability and reduction of external impacts through enhanced engagement and regulation of the activities of related economic sectors including EIA. The main wetland areas in Hainan are coastal where the pressure is most severe. The PA system will cover adequate amount of coastal wetlands and the Hainan Forestry Department and subsidiary county departments will have sufficient systemic and institutional capacity to adequately manage the PAs. Economic sectors such as tourism and aquaculture will adopt a production practice that does not pose negative impacts on the biodiversity within the mangrove PAs. However, there are a number of systemic, institutional and financing barriers that impede the systematic increase in PA management effectiveness as a means of attaining the long-term conservation solution.

Barrier 1: Insufficient PA coverage, operational financing and systemic and institutional capacity at provincial level

53. The PA system in Hainan Province only covers 8.4 % of the terrestrial areas, comprising mostly small NRs are less than 10,000 ha. In order to protect the island's terrestrial biodiversity, wetland areas and increase their resilience to climate change impact, expansion of many NRs and creation of several corridors between them are required in order to meet the new target of 11.79%, cover existing gaps and improve habitat continuity. In addition, coastal NRs, in particular the seven existing mangrove NRs with higher degree of naturalness, need extending where land is available. The 2011 review of Hainan's PA system in terms of gap analysis of biodiversity coverage and delivery of ecosystem services concludes that the present PA coverage was geographically biased toward its central mountainous areas with higher elevations, rugged terrain, and infertile soils. Under-protected lowlands and coastal areas tended to have higher animal species richness, and the nature reserve coverage was not enough to capture lowlands biodiversity features. Hainan Province needs to implement systematic planning approaches to define clear visions for guiding future conservation actions, and develop flexible management and funding mechanisms geared toward sustainable use of natural resources. In addition, effective PA management in Hainan is also hindered by weakness in the legal basis for PA development and management. The outdated national regulations on nature reserves do not provide much flexibility in terms of zoning and management options. The result is that the actual management on the ground comes nowhere near the strict regulations for NRs., In contrast, the "Overall Land Use Plan of Hainan Province with Biodiversity Conservation (2006-2020)" was approved by the State Council in December 2009, as well as guidelines for integrating biodiversity into land use planning with the support of the EU-China Biodiversity Programme implemented through the UNDP. However, this has yet to be effectively applied, and should be considered together with the Hainan Mangrove Protection Regulation in determining further needs for land zonation related to the developing PA system, as well as more specific official standards and guidelines for coastal and catchment PAs and guidelines for managing wetlands to increase resilience. Furthermore, although the majority of the PAs are managed by the Hainan Forestry Department, the department's staff lack any specialist training, there are no accepted competence or performance standards and there is little accountability and supervision. The management effectiveness of Hainan's PA system and individual PAs is also constrained by a chronic shortage of funding to cover operational management costs (see **Annexes 1 and 2** for baseline information from METT and Capacity Development scorecards respectively). This shortage of funding is most acute for city and county level nature reserves that depend on local government for financing, but also applies to provincial nature reserves (provincial government funding) and national nature reserves (provincial and central government funding). There are opportunities for developing the eco-compensation schemes in direct support of wetland PA management, however, such potential has not yet being sufficiently tapped.

Barrier 2: Limited tools and capacities for wetland PA site management

54. Lowland and coastal NRs, including mangrove, and biodiversity are the most threatened with population and development concentrated in these areas. Although there are seven mangrove wetland PAs in Hainan, their management is suboptimal and there is little coordination and joint action between them to ensure that mangrove ecosystem in Hainan as a whole will be enhanced for adequate protection. As such, there is no integrated management planning system for the mangrove PA network, no uniform mechanisms to control external threats to mangrove ecosystems such as tourism development and operation, and virtually no sharing and exchange of information between these reserves. In addition, six out of seven NRs are provincial or local NRs, with much smaller government budget allocation and staff numbers. Given the critically small area of remaining mangroves in Hainan, and in order to implement the mangrove protection regulation, the protection status of NRs needs to be elevated and management effectiveness at the site level as well as the mangrove NR network level, needs to improve drastically. This would include better zonation including effective model buffer zones, improved law enforcement action, accelerated mangrove restoration work, and inclusion of different wetland habitat types in the PA

system. Furthermore, many coastal wetland NRs have direct livelihood impact. For example, the Dongzhaigang NNR area also provides an important resource for more than 4,000 families living around the bay - in the form of fisheries, shellfish collection and fuel wood supply, as well as ecotourism related employment and business opportunities. However, daily intrusions into NRs by the local inhabitants are causing serious over-fishing, over-harvesting and resulting disturbance to ecosystems and biodiversity (especially water birds). Without the involvement of the local communities, effective NR management will be difficult. It is essential to develop co-management mechanisms and promote alternative livelihood schemes. Given the fast rise in the tourism industry on Hainan there are plenty of opportunities to be tried. Negotiations with upstream farmers are also important to regulate the levels of chemical pollutants entering into the water system. However, the NR staff lack capacity to establish and manage co-management arrangements. Similarly, community institutional arrangements do not exist for such management in most areas and their capacities for effective management and legal enforcement are also very weak.

Barrier 3: Disconnect between wetland PA sub-system management and development planning and sectoral planning

55. Hainan's PAs face the same generic problems as NRs in other provinces in terms of extreme pressure from often poor local communities and many other sectors and stakeholders. As the whole of Hainan is a large catchment area, coastal wetland PAs are affected by the movement of pollutants from outside the NR boundaries and therefore beyond the immediate control of the management authority. As a result, coastal wetland PA management cannot be effective without ensuring the integrity of the PA system as a whole, including adequate attention towards catchment management to maintain wetland biodiversity and ecosystem functions. Several government agencies such as agriculture, fisheries, mining, water resources operate inside PAs alongside the local county governments. These agencies tend to operate independently from the PA management authorities. This has led to promotion of many activities that have negative impacts on biodiversity and ecosystems. In the case of Dongzhaigang, many destructive activities such as intensification of seafood harvesting, conversion of mangroves into fish ponds, duck farming in mangrove forest and intensification of tourism activities are all actively encouraged by other government departments such as ocean and coast authorities, agriculture department, as well as the recently approved Hainan International Tourism Island Master Plan. These all place heavy threats on the viability of the NR and impact ecosystem services. Despite the passage of the mangrove protection regulations, with overlapping jurisdictions and mandates over different elements of PAs, it is difficult for SFA or other PA authorities to exert strong control of the activities within wetland NRs and protection is dependent on developing good coordination and negotiation with different stakeholders. An underlying issue behind this disconnect and the associated chronic shortage of budget for PA management is insufficient understanding of the economic value of wetland biodiversity and ecosystem services. How the loss of these will economically affect various industries and peoples' livelihoods need to be clearly shown and accepted by the government planners and decision makers, industries and local communities. Availability of insufficient or outdated data and information is another problem. Even where ecological and other data exists, lack of access and sharing prevents it being used for effective planning sector developments that might adversely impact PAs and biodiversity, or planning of mitigation and adaptations strategies in the face of a changing climate. Great improvements can be made to the existing data and information system so that wetland services can be fully harnessed and not degraded during the 'green development' process.

INTRODUCTION TO SITE INTERVENTIONS

56. There are more than a dozen wetland NRs and wetland parks (WPs) on Hainan Island (**Fig. 7**). The sites for project demonstration were selected according to their significance for biodiversity conservation, value in demonstrating responses to different types of threats, current conservation status, levels of public awareness and participation in nature conservation, and potential for improvement. They

include 6 coastal wetland nature reserves and one national wetland park, whose major characteristics are listed below (**Table 6**). More detailed information about these coastal PAs can be found in **Annex 4**

FIGURE 7. DISTRIBUTION OF MAJOR WETLAND NATURE RESERVES (NR) AND WETLAND PARKS (WP) ON HAINAN ISLAND

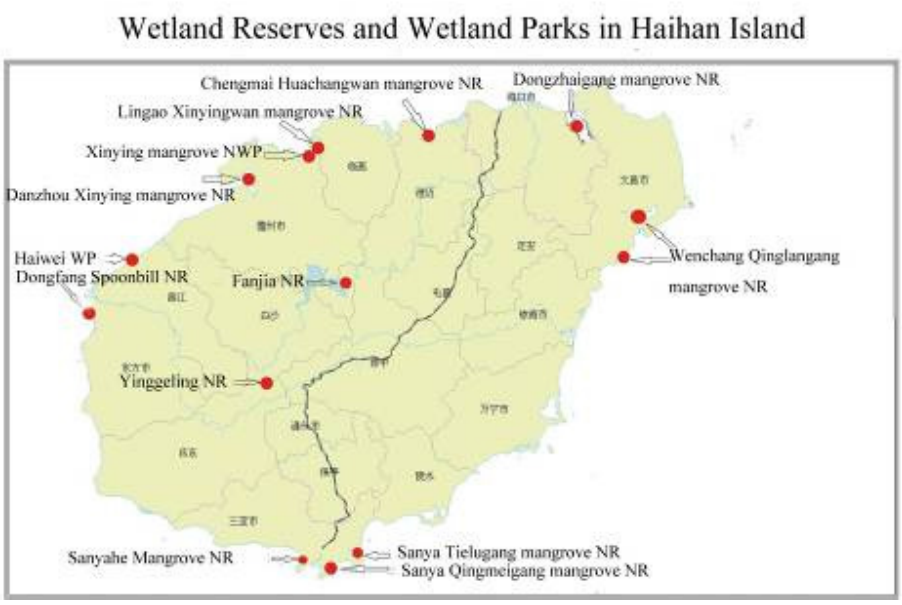


TABLE 6: MANGROVE NATURE RESERVES AND WETLAND PARKS IN HAINAN PROVINCE SELECTED AS PROJECT DEMONSTRATION SITES

	Name	City	Area (ha)	IUCN Rank	Category	Sample species of special interests	Staff #	Temp helpers	Annual budget (US$)	METT scores
1	Dongzhaigang Mangrove NR	Haikou	3337	IV	National	Mangrove wetlands	38	6	259862	42
2	Xinying mangrove NWP	Danzhou	507	IV	National	Mangrove wetlands+Black-faced Spoonbills	2	6	5800	26
3	Qinglangang Mangrove NR	Wenchang	2905	IV	Provincial	Mangrove wetlands	14	14	50200	39
4	Dongfang Spoonbill NR	Dongfang	1429	IV	Provincial	Black-faced Spoonbills and their habitats	2	3	31400	45

5	Sanya Mangrove NR	Sanya	728	IV	City level	Mangrove wetlands	4	7	26700	30
6	Danzhou Xinying Mangrove NR	Danzhou	115	IV	City level	Mangrove wetlands	1	0	3100	15
7	Huachangwan Mangrove NR	Chengmai	150	IV	County	Mangrove ecosystems	2	0	7600	27

Note: NNR – National Nature Reserve, PNR – Provincial Nature Reserve; CNR: County or City level Nature Reserve; NWP: National Wetland Park. Staff # as of 2011.

STAKEHOLDER ANALYSIS

57. During the project preparation stage, a preliminary stakeholder analysis was undertaken in order to identify key stakeholders, assess their interests in the project and define their roles and responsibilities in project implementation. See the Stakeholder Participation Plan in Section IV Part IV for the major categories of stakeholders identified, their roles and responsibilities in the project, and the project's approach for stakeholder involvement. **Table 7** lists the key stakeholders associated with Hainan's PA systems.

TABLE 7: KEY STAKEHOLDERS MATRIX FOR HAINAN PA SYSTEMS

Stakeholder	Roles and Responsibilities
Ministry of Finance	Operational Focal Point (OFP). Coordination and implementation of GEF projects
State Forestry Administration (including National Wetland Conservation Center)	Responsible for forest lands, most of China's nature reserves, wildlife issues, wildlife trade (CITES), wetlands protection (Ramsar Convention), drafting of departmental level regulations especially wetlands.
Hainan Provincial Government	Responsible for provincial administration, development planning and implementation, as well as planning and financing of the provincial PA system. Leadership and coordination for implementation of the project
Standing Committee of People's Congress of Hainan Province	Responsible for coordination of legislation and regulation functions in Hainan, including the provincial regulation of nature reserve management and regulation of wetland conservation.
Hainan Province Development and Reform Commission	Coordination and implementation of Hainan's Development Plan (including wetland conservation).
Hainan Department of Finance	Financial responsibility for the project, including compilation and submission of budget requests, financial monitoring and management, as focal point agency at the local level for GEF funded projects.
Hainan Forestry Department at provincial and local government levels (including NR bureau and wildlife protection bureau)	Responsible for planning and managing the provincial PA system, and conservation of fauna and flora in the province. Also responsible for wetland management. The Provincial Forestry Department will be the main executing agency of the project.
Hainan Marine and Fishery Department	Implement and oversee the national Oceanic and Fishery policies, monitor the marine economy operation, protect marine and fishery environment, coastal aquaculture development, management of marine nature reserves
Hainan Water Resources Department	Sustain water availability, security and quality control, avoiding over-exploitation of water resources
Hainan Land Environment and Resource Department, Ecology Bureau and local governmental	PA system planning and management of specific nature reserves. Coordination of environmental issues, pollution and CBD implementation and reporting, execution of CBPF. Processing and coordination of drafting

bureaus	new legislation. Must be involved in any proposed regulatory revisions.
Hainan Tourism Department	Responsible for planning and implementing tourism development plans. High levels of collaboration and mainstreaming required to ensure tourism plans do not threaten NRs.
Agriculture department of provincial and local governments	Responsible for agriculture and fisheries, including agro-biodiversity. Major stakeholder in terms of water use and sources of agricultural water pollution responsible for freshwater and brackish fisheries. Should mainstream biodiversity and PA protection within their plans and avoid causing pollution of wetland sites. Can help monitor wetland biodiversity on agricultural lands adjacent to NRs. Need cooperation in controlling fishing within sustainable limits.
Land department of provincial and local governments	Responsible for land use planning and land allocation. Critical partner to ensure sound coastal land use planning under development and sectoral plans.
Hainan Meteorology Bureau	Monitoring of climatic factors, models of climate change, effects on vegetation, etc.
Haikou City government	Responsible for the city administration, development planning and implementation, as well as management of Dongzhaigang NNR
Management Bureaus of Nature Reserves (Dongzhaigang NNR, Qinglangang PNR, Dongfang PNR, Xinying Mangrove NWP, Sanya Mangrove NR, Danzhou Xinying Mangrove NR, Huachangwan Mangrove NR)	Planning, protection and management of nature reserves, visitor control and environmental education/awareness. Execution of project activities.
Chinese Academy of Sciences, several specialized and regional academic and research institutes, universities, including: Tsinghua University, Hainan University, Hainan Normal University, Research Institute of Tropical Forestry, Hainan Marine Development and Design Institute.	Technical expertise available on hydrological, botanical and zoological aspects. Available for sub-contracted research, specialist training workshops, post-graduate courses and programmes
Local target communities /project partners	Primary resource users and traditional management of wetland and forest ecosystems, including women. Local communities around the mangrove PAs will be participants in the co-management activities as well as being beneficiaries of the livelihood support. For the PA expansion and consolidation component, local residents including indigenous/ethnic minorities in inland areas will fully participate in the process of determining the new PA boundaries as well as the rights and responsibilities of the resident communities over resources within the PAs and in the model buffer zones. There are two main ethnic minorities Li (800,000) and Miao (50,000) living mainly in the inland mountain areas in the south western parts of Hainan. Although they will not directly benefit from the enhanced mangrove management, they will indirectly benefit from the strengthened PA system in Hainan including mountain forest PAs through its systemic and institutional components. There are also Li minority villages in the vicinity of Sanya Mangrove Nature Reserve and Changjiang Haiwei Wetland Park, which will be proactively considered for involvement in appropriate project related activities.
Other local communities	Not formal partners in co-management, but communities with experience from which the project can learn (e.g., forms of community governance, traditional use of biodiversity, etc.)

Private sector organizations and businesses	At both Dongzhaigang NNR and Xinying NWP, farm companies are key stakeholders, managing land use, related infrastructure and playing an important role in relation to local communities. Their involvement in related activities such as community co-management, awareness events and in participating in the resolution of conflicts and threats is important. At Qinglangang and Dongzhaigang, tourism companies have a major role in local development and are significant partners for the reserves to engage in supporting habitat restoration, employment for local communities and ecologically sustainable development. Other business interests will also be involved.
NGOs in Hainan Province, national and international environmental NGOs (e.g. Wetlands International, WWF, local NGOs)	Involvement in wetlands and biodiversity projects. Available for technical support, consultancies, training and monitoring. High capacity for grass roots action with local communities. Roles of local CSOs follow:
The Youth Volunteer Association with Economy and Administration School of Hainan Normal University and Tourism Research Society with Institute of Economics in Haikou	Involvement in environmental awareness promotion and social investigation related activities
Hainan Bird Watching Association and Green Leaf Environmental Conservation Association under Hainan University	Involvement in bird monitoring and survey related activities.
Haikou Xingda Banana Specialized Cooperative Society and Haikou Jiangbin Aquaculture Specialized Cooperative Society	Can contribute to promoting best practices and modern techniques as well as knowledge in terms of sustainable agriculture development to mitigate threats caused by incompatible agricultural and aquacultural practices. The two societies can also play an important role in promoting advanced environmentally friendly knowledge and techniques to facilitate the implementation of alternative livelihoods.
China Mangrove Conservation Alliance	Can contribute to mangrove reforestation activities.

Baseline analysis

58. The baseline for this project is the "business-as-usual" scenario that would take place during the next 5 years in absence of the interventions planned under the project. Under the project baseline state, a range of activities relating to the management and expansion of wetland PAs, and to the mitigation of threats posed by human activities and climate change within the province's PAs, would be undertaken. These would have some positive impacts on Hainan wetland ecosystems and their flora and fauna. However this baseline scenario alone (currently planned work) would not greatly reduce any of the major barriers identified above. Nonetheless the baseline does provide a useful platform for environmental conservation and PA development upon which this project can build, and upon which new synergies for the maintenance of biodiversity (through co-management and other means) can be tried, developed and applied regionally.

59. Although great efforts are already taking place to conserve rare wildlife or restore their habitats on Hainan Island while the entire province is developing the island as international tourism island, few specifically address environmental issues from the perspective of wetland biodiversity conservation. Despite being labeled as "ecological restorations" or "ecotourism development", many of these projects are in fact partially destructive to biodiversity (e.g., building roads and highways, constructing walkways to dense mangrove forests, building canals for river water diversions, developing "farm experience" (or "NongJiaLe" in Chinese) restaurants inside or around fragile wetlands like mangroves, etc.). All the

barriers listed above would remain unaddressed. Specific levels of activity in relation to pertinent issues that can be expected without this GEF supported intervention are summarized below.

Mainstreaming PA objectives in development planning

60. Legislative reform: Despite some inadequacies of existing legislation and regulations concerning PA establishment and management, it is unlikely that these issues will be addressed in the near future by national or provincial governments without the leverage of this project. At national level, MEP is revising regulations on national nature reserves to include more biodiversity concerns in establishing these PAs. However even these newly revised environmental regulations will need to be tailored to be more relevant to specific conditions in Hainan. At provincial level, the Regulation on Mangrove Protection in Hainan Province was passed in July 2011 by the People's Congress of the Province. The Regulation provides for, *inter alia*: (i) protection of mangrove sites from encroachment and pollution; (ii) sustainable harvesting from mangrove areas in model buffer zones and; (iii) restoration, replanting and combating invasive species. Some reserves have started raising local awareness of this regulation in order to encourage compliance, but more effort is needed in this regard – including with other sectoral agencies.

61. Eco-compensation initiatives: The policy makers at national and provincial levels have become increasingly interested in developing new approaches to address China's multiplying conservation challenges and resource constraints in the face of fast economic growth. In particular, local governments have been important contributors to this process, rapidly adapting centrally designed "eco-compensation" programs to their own needs, creating "hybrids" — programmes that weave together and draw upon multiple central and provincial policies and funding sources — and creating their own distinct initiatives that often feed back into central government policy development. There are opportunities to adapt such schemes to the Dongzhaigang situation so long as strong and convincing economic arguments for improved ecosystem services can be made.

62. Financing of PAs: During the 11th Five-Year Plan period (2006-2010), the Chinese central government has invested US$216 million in carrying out wetland conservation, restoration, sustainable use demonstration and capacity building since the State Council approved the National Implementation Plan on Wetland Conservation Program. In May 2010, the Government decided to earmark US$ 30 million as special funds to subsidies management of 20 Ramsar sites (including Dongzhaigang NNR), 16 wetland nature reserves and 7 national wetland parks in China in implementing projects in terms of wetland monitoring and ecological restoration. Whilst funding for PAs throughout China including Hainan is expected to increase in the next few years, this funding will focus mainly on physical infrastructure (town offices and buildings), rather than on increased staffing, field posts (stations) and operational costs. The current distribution of PA funding from the central government within the province is also very skewed. For example, one mangrove NNR (i.e. Dongzhaigang NNR) receives majority of current funds available from central government for wetland NRs. The Hainan Provincial Government[18] and local governments currently allocate around US$20 million per year for forest protection, conservation and the development and operations of the PA system, including funding for infrastructure development through projects such as the NR conservation and capacity building projects. In addition, through the Wetland Ecological and Conservation Subsidy Project for Ramsar Sites, the National Government with co-financing from the local government invested US$952,000 in 2011 for enhancing mangrove and wildlife protection and restoration within the Dongzhaigang NNR. The central government, with local government co-financing, has also invested US$222,000 through the Nursery Construction Project, providing seedlings for mangrove afforestation. The National Forest Protection Project and Ecological Forest Conservation Project is providing US$ 630,000 (partially cost-shared by local

[18] Not only Hainan Forestry Department, whose PA system budget allocations are given in the financial scorecard sheet of Annex 1.

governments) to support maintenance of natural forest and capacity building for forest management in Hainan.

63. Ecotourism: With Hainan's major focus on the development of its international tourism industry under the 12th Five Year Plan, a variety of forms of tourism development will take place. Key tasks under this plan include: 1) to enrich sightseeing products, based on national culture and natural heritage and scenic areas, to develop sightseeing routines; 2) to speed up the development of recreational tourism products including outdoor recreation such as forest and wetland tours; and 3) to protect tourism resources - paying special attention to the protection of nature, heritage and culture in tourism planning, fully implement green development, eco-tourism and low-carbon tourism to ensure the harmony between tourism and nature, as well as culture.

64. This offers opportunities, including the development of appropriate tourism plans for nature reserves, involvement of local communities in tourism activities and demonstration of ecotourism. However, without appropriate guidance, such developments can be detrimental to ecosystems, wildlife habitat and biodiversity in general. It is also likely that such tourism/recreation developments will be externally driven, poorly regulated and without fair benefit accruing to local communities. Within the scope of ecotourism, there could be inappropriate wildlife hunting or harvesting of rare marine species for tourist consumption, boating or even helicopter viewing of mangrove wetlands, and even building luxury resorts next to NRs or within WPs. Inasmuch as eco-tourism is being developed (e.g., Qinglanggang PNR and other NRs in the province), this also remains poorly defined (it is generally confused with nature tourism) and it may not bring any benefit for conservation or local communities – ecotourism is about uniting conservation, communities, and sustainable travel.[19]

PA system planning and monitoring

65. PA planning: With the support of the EU-China Biodiversity Programme implemented through the UNDP, the "Overall Land Use Plan of Hainan Province with Biodiversity Conservation (2006-2020)" was approved by the State Council in December 2009. Technical guidelines for counties to incorporate biodiversity in land-use planning and for Environmental Impact Assessment on Land Consolidation were also developed and approved by the Department of Land and Resources. However, actual application of the plans and guidelines has yet to be seen. In addition, the PA system planning and review has been undertaken by interested academics from time to time proposing new PAs. However, the exercises tended to be academic and not part of official planning of local government. There remains a need for PA system planning to be agreed with the government departments concerned and integrated into the overall development plans and Tourism Master Plan for the province. In this way there is a high chance of appropriate funding being approved and plans being realized.

66. The third key project on environmental conservation and ecological development highlighted in the 12th Five-year Development Plan is *Ecological Development Project: To continue to increase and conserve coastal defense forest, natural forests, and shelter forests along the coastline, road and urban; returning agricultural lands to forests, conserve biodiversity, key functional zones and nature reserves*. Accordingly, the approved 12th Five-year Development Plan for Haikou City highlights improving the effective management of Dongzhaigang NNR, including improving their capacity. In addition, Haikou City will conduct wetland protection and restoration by establishing Hainan Dongzhaigang National Wetland Park, Haikou Nandujiang Estuary Provincial Wetland Park and Haikou Baishuitang City-level Wetland Park. This provides a positive opportunity for the project to provide capacity building support and technical assistance that is well aligned with national, provincial and local government priorities.

[19] The International Ecotourism Society defines ecotourism as "responsible travel to natural areas that conserves the environment and improves the well-being of local people."

67. Expansion of the conservation estate: The development objective for the PA system under the 12th Five-Year Outline Plan for Forestry Development in Hainan Province is: *By 2015, Hainan Province will establish a batch of new national and provincial nature reserves and further consolidate the management of existing nature reserves to improve the ecological health within reserves in Hainan. As a result, 88% of state key conservation wild flora and fauna, 67% higher plant and their communities, and 92% typical terrestrial ecosystems are well conserved in nature reserves, forest parks and wetland parks by 2015.*

68. During the 12th Five-Year period, the Hainan Forestry Department targets under the Biodiversity Conservation Project are:

(1) To conduct a rehabilitation project for endangered flora and fauna, including Black-crested Gibbon *Hylobates concolor hainanus*, Eld's deer (*Cervus eldii hainanus*), and rare plant species*;*

(2) To continue to advance the infrastructure development in six NNRs, ameliorate infrastructure development for all PNRs and initiate a model nature reserve development project;

(3) To upgrade Yinggeling PNR to national level;

(4) To include unprotected lands into the existing nature reserve network by newly establishing six PNRs;

(5) To advance the development of Hainan Baomeiling and Dongfang Black-faced Spoonbill PNRs;

(6) To establish and ameliorate three CNRs, including Sanya mangrove, Lingao Xinying, and Mingrenshan nature reserve;

(7) To establish ecological corridors, including Bawangling-Yinggeling, Yinggeling-Limushan, Wuzhishan-Yinggeling, and Wuzhishan-Diaoluoshan.

69. In summary, the HFD project aims to soundly design the spatial distribution of nature reserves to fully represent the ecological features of Hainan Province. Specifically, the spatially well-designed nature reserve network will provide security for tropical forest ecosystems and their associated biodiversity in the middle montane areas, wetland ecosystems and their associated biodiversity along the coastal regions, and rare and endangered species in other areas of Hainan Island.

70. According to the Hainan Provincial Master Plan for Nature Reserves[20]， Hainan Island will have 42 improved natural reserves with a total area of 2,901,400 ha by 2014 (**Table 8, Fig. 5**). The terrestrial area of natural reserves is estimated at 412,600 ha, accounting for 11.79% of the total land area of Hainan Island. Of all the nature reserves，there will be four newly created reserves (88,000 ha), four adjusted reserves (with an expansion of 80,100 ha), six integrated reserves combining 17 existing nature reserves, and four upgraded reserves．

[20] Xiao Y，Chen S B，Zhang L，Yue P，Ouyang Z Y，Liu X C Designing nature reserve systems in Hainan Island based on ecosystem services. Acta Ecologica Sinica， 2011，31: 7357-7369

TABLE 8 FUTURE DEVELOPMENT OF THE PROTECTED AREA SYSTEM IN HAINAN ISLAND

Approach	City or County	Present nature reserves	New/Modified nature reserves
New construction	Ledong		Mumiao
	Sanya/Baoting/Wuzhi mountain		Baolong
	Qiongzhong		Shuangpin
	Baisha		Chongpo
Adjustment	Changjiang	Bawangling	Bawangling
	Dongfang/Ledong	Jianfengling	Jianfengling
	Qionghai	Huishang	Hui mountain
	Qionghai/Wanning	Jianling/Qiexin/Nanlin/Shangxi	Jianling
Integration	Haikou/Wenchang	Dongzhaigang/Qinglangang	Dongzhaigang mangrove NNR
	Linggao/Chengmai/ Danzhou	Caiqiao/Huachang Bay/Xinying Bay	Northwest coast mangrove
	Sanya	Sanya River/Tielugang/Yalong Bay Qingmeigang	Sanya mangrove
	Danzhou/Lingao	Danzhou Baihubai/Lingao Baihubai/Linqiangshiniao	Northwest rare sea creatures
	Wenchang/Qionghai	Wenchang Qilincai/Qionghai Qilincai	East coast Qilincai
Upgrading	Ledong/Wuzhi mountain/ Qiongzhong/Baisha	Yinggeling PNR	Yinggeling NNR
	Ledong	Jiaxi PNR	Jiaxi NNR
	Qiongzhong	Limushan PNR	Limushan NNR
	Wanning	Jianling PNR	Jianling NNR

71. However, the Master Plan still needs to be officially approved and is therefore unlikely to be implemented in the near future. In addition, due to the sudden increase in land values on Hainan Island as a result of its Special Economic Zone (SEZ, like Shenzhen, Zhuhai, Xiamen, etc.) status and International Tourism Development, it will become increasingly difficult to justify the creation of new major PAs, extension of existing reserves or establishment of corridors to maintain resilience to the impacts of climate change. Therefore, it is important for the project to capitalize on existing windows of opportunity provided by the Hainan PA System Master Plan and the current favourable policy environment.

72. National Biodiversity Conservation Strategy and Action Plan: In 2010, MEP developed a National Biodiversity Conservation Strategy and Action Plan (NBSAP) (see section on **Consistency with National Policies and Plans** for details). Following the successful development of provincial- and municipality-level BSAPs in several regions of China, MEP has subsequently requested that all provincial EPBs develop BSAPs. Without being informed by a full PA systems review, a BSAP for Hainan is unlikely to adequately address PA development needs. Further development of the provincial PA estate also would likely remain weak due to critical shortages of staff, low staff capacity and insufficient funding.

73. Information and knowledge management: At the national level, SFA is developing a wetland and related biodiversity information system following the completion of national wetland inventory (NWI) surveys in 2007-2012. Software will be developed to handle wetland and related biodiversity information on a transparent platform for public access and to inform decision making. The NWI survey covers all provinces in China including Hainan (to be completed by the end of 2012), so there is likely to be some improvement in collection, storage and sharing of wetland and related biodiversity data organized under NWI. However it is difficult to predict how useful such a data system will be for Hainan's planning and

management of the PA system, and it is likely to fall short of the information management system envisaged under this project (in terms of data to be collected, geographic coverage and quality/accuracy).

74. Biodiversity monitoring: The baseline status of biodiversity (fauna and flora) monitoring remains very patchy. However measurements of marine fisheries stocks, birds watching and visiting of rare or endangered species at selected wetland sites would all continue. Individual scientists and experts would continue to pursue their own taxonomic interests. Global monitoring of endangered species, trade, and wetland conditions would also continue. However, there is no plan to institutionalize routine biodiversity monitoring at a provincial level and no plan to consolidate various elements of biodiversity monitoring that already are occurring.

Institutional capacity building

75. Strategic planning: There is adequate biological expertise on wetland and related biodiversity conservation at the provincial level or in selected universities or institutes in mainland China. For example, Hainan Normal University has conducted comprehensive studies of land-use change, bird distribution and nesting status, pollutant distribution and purification, and ecosystem service valuation of Hainan's coastal wetlands, especially in Dongzhaigang Mangrove NNR, Qinglangang Mangrove PNR, Dongfang Black-faced Spoonbill PNR, and other wetland NRs. More famous universities such as Zhongshan University (Guangzhou, Guangdong), Xiamen University (Xiamen, Fujian), Institute of South Seas, CAs (Guangzhou) and Institute of Tropical Forest, Chinese Academy of Forestry (Guangzhou) have studied structure and functions of mangrove and other coastal wetlands in Hainan for many years. Recently, scientists from Tsinghuia University (Beijing) started working on restoration techniques and carbon sequestration potentials in Hainan mangroves and seagrasses. However this expertise is not mobilized into strategic planning, as department planners rarely invite academic experts to participate in their planning processes. Difference departments also tend to plan independently of each other, resulting in lack of cross-sectoral integration of different plans and programs. There are also insufficient social scientific studies on a variety of topics affected conservation outcomes, including *inter alia* inter-community comparisons regarding the sociological and other factors that may affect the success/failure of co-management initiatives. Such paucity of relevant sociological information also will be redressed in part by the project.

76. PA staffing: Staff levels are totally inadequate to patrol even existing nature reserves, let alone PA system expansion (see **Table 5**). HFD is also limited in its ability to hire new staff due not only to funding shortages but also to government structural arrangements. This chronic shortage will remain without specific inputs from external sources that tackle the substantial recruitment bottleneck.

77. Law enforcement capacity: HFD field staff currently do not have powers of arrest, and community stewards (or wardens, or wildlife monitors) have even less authority. Both groups are also handicapped by lack of transport, travel budgets, communications equipment and adequate training. This situation will not change unless it is specifically addressed by this or other similar projects. Dongzhaigang has installed a video surveillance system that allows remote monitoring of human activities from its protection stations (the same system is being used at certain other NNRs in China). While effective, the cameras are mounted on the protection stations (so that the cameras are secure), limiting the scope of coverage. The cameras can also be used for monitoring wildlife if suitably located.

78. Training activities: Although few staff currently working on the PA management in Hainan have enough training backgrounds in administration, management, accounting, or basic forestry, there is no specific institutionalized training in Hainan in PA management, wildlife management, ecology, or biodiversity monitoring – and there are no plans to rectify this situation.

Public awareness and participation (including co-management)

79. Education and awareness: Without the project, public education and awareness programs will remain generally low key. Poster exhibitions, brochures, newspaper articles and short videos will form part of the general awareness programs of SFA, HFD and local NR bureaus. Visitor centers of only NNRs and PNRs provide visitors with interpretive displays. General programs of wildlife and biodiversity are shown periodically on different national and provincial TV channels. However, such environmental education and awareness projects associated with wildlife and PAs will remain largely unstructured. Furthermore, most displays at NR visitor centers or along walkways were either out of date in scientific contexts or with poorly-translated English, which limits the effectiveness of public education on wetland and related biodiversity values.

80. Co-management: Existing co-management initiatives will continue to depend on the long-term commitment and financing of concerned NGOs spearheading community-centred conservation projects. For example, AUSAID implemented Wetlands Management Policy, Guidelines & Capacity Building Project (ACEDP) in Dongzhaigang NNR during 2007-2012 to support NR on payments for ecosystem services, policy review and capacity building (just completed). However, there is no opportunity to significantly upscale this approach without additional external funding.

Habitat restoration initiatives

81. Restoration of degraded coastal wetlands: Under national and provincial reforestation programs such as the "Coastal Green Belt" project, very large budgets will continue to be expended on different types of ecological restoration and construction projects along the coastlines of Hainan Island. However, most of this work has been focused on forest plantations and few are based on a sound understanding of the local ecology or wildlife of coastal wetlands. Much of planting with exotic species of fast growing such as *Sonneratia apetala* (from Bangladesh) and *Laguncularia racemosa* (from Mexico), river water diversions, and sea wall construction (for coastal protection) are in stark contradiction to the needs of wetland protection and biodiversity conservation, which require a more hands-off approach to allow the natural environment to heal itself (to be restored to its equilibrium state, or to its pre-disturbance condition). The policy environment remains favourable for forest and wetland restoration, as it is included in the national five year plan for the forestry sector (see section on **Consistency with National Policies and Plans** for details).

Climate change research and adaptation

82. Climate change has become a growing concern of the government. At national level, it forms the basis of numerous international negotiations and national programmes for finding a 'green development' path forward. The lead national agency on climate change issues is the National Reform and Development Commission (NRDC), and China was the first developing country to publish a National Action Plan on Climate Change. The thrust of national efforts is on increasing energy efficiency, increasing proportions of 'green' energy, and developing alternative energy sources. However the contribution of healthy ecosystems such as coastal wetlands to better fixation of atmospheric carbon is given inadequate attention until recent years, and the impact of climate change on biodiversity is not specifically addressed. At provincial level, climate change is more concerned with increasing frequences of extrement weathers such as floodings, tropical storms, which can result in reserious damages to local properties and local residents. However, most climate change metigation measures taken by local government agencies are engireering oriented rather than based on ecological principles. The great values of coastal wetlands such as mangroves for coastal protection, as proved by many field studies and validated by 2004 Tsunami in Southeast Asia, have not been appreciated by local decision makers.

83. In conclusion, baseline activities would be inadequate to significantly improve the current management effectiveness of, and the mitigation of threats to, the existing wetland PAs in Hainan Island.

Public awareness of the threats to wetland habitats, wildlife and biodiversity will remain low and the value of PAs to the economy of Hainan will not be optimized. Local communities resident in or near PAs would remain largely marginalised. Moreover, major engineering projects would proceed without consideration of implications for PAs, and the opportunity to tackle basic inadequacies in legislation and mainstreaming wetland PAs and related biodiversity into planning would be missed.

PART II: Strategy

PROJECT RATIONALE AND POLICY CONFORMITY

Fit with the GEF Focal Area Strategy and Strategic Programme

84. The project is aligned with the GEF BD-1 objective: Improve Sustainability of Protected Area (PA) Systems. More specifically, the project contributes to Outcome 1.1: Improved management effectiveness of existing and new PAs and Outcome 1.2: Increased revenue for PA systems to meet total expenditures required for management. The project will contribute to the objective and outcomes by creating a strong provincial system for managing the PA system and the sub-system of mangrove PAs, improving the spatial design of the PA system and bringing at least an additional 40,000 ha under protection, ensuring better terrestrial ecosystem representation and filling ecosystem coverage gaps. The project will strengthen the management effectiveness of existing and new PAs (as indicated by METT scores) through a range of measures including staff training, improved monitoring and law enforcement, establishment of model buffer zones, and development of co-management arrangements with community participation *inter alia*. Valuation of key ecosystem services and local resource use will underpin awareness raising on the values of wetland PAs, supporting arguments for improved operational budgets, while demonstration of an eco-compensation scheme will be conducted as a basis for improving the sustainability of PA management. The project will reduce external threats by integrating wetland PA objectives into planning and practices of key sectors including tourism, aquaculture, water resources and coastal development, which to some extent contributes to BD-2 objectives. However, the project objective for mainstreaming is directly linked to the PA system strengthening, in line with the programmatic framework which is aligned with BD-1.

85. The project will contribute to the achievement of GEF's main indicators under this priority programming area as follows:

Relevant GEF-5 BD Strategic Program (SO)	Expected outcomes	Relevant GEF-5 BD Indicators	Project contribution to GEF-5 BD Indicators
GEF BD-1 objective: Improve Sustainability of Protected Area (PA) Systems	Outcome 1.1: Improved management effectiveness of existing and new PAs	Protected area management effectiveness score as recorded by Management Effectiveness Tracking Tool	METT scores of 7 targeted wetland protected areas increase from a mean baseline of 32% to mean target of 52%
	Outcome 1.2: Increased revenue for PA systems to meet total expenditures required for management.	Funding gap for management of protected area systems as recorded by protected area financing scorecards.	Financial sustainability scorecard increases from an average of 24.33% to >48.67%

86. China's commitment to biodiversity conservation and PA development is evident in its signature to the Convention on Biological Diversity (CBD) in 1992, and its active participation in other MEAs including the Ramsar Convention (also signed in 1992, with 41 Ramsar sites totaling 3,709,853 ha as of September 2012), CITES (1981) and UNFCCC (1992). Migratory waterbirds dependent upon wetland habitats are covered by various bilateral agreements including the China – Australia Migratory Birds Agreement, and 19 wetlands have been listed for the Flyway Site Network under the East Asian – Australasian Flyway Partnership.

87. China has remained steadfast in its commitments under CBD and in particular with activities under article 8 (*in situ* conservation; including especially sub-articles 8 (a-e) regarding protected areas and landscape conservation, and articles 8 (i-j) regarding sustainable use of natural resources, local communities and traditional knowledge). A very extensive national system of protected areas has already been established: by 2010, China had established over 5,000 PAs covering more than 18% of the national territory.

88. The project directly addresses CBD's Strategic Plan for Biodiversity 2011-2020 and the Aichi Biodiversity Targets (CBD Decision X/2) Target 11: *By 2020, at least 17 per cent of terrestrial and inland water areas, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscapes and seascapes*. It also addresses CBD Decision X/28 on *Inland Waters Biodiversity* and X/29 on *Marine and Coastal Biodiversity*. In addition, it directly contributes to the goals of CBD's *Programme of Work on Protected Areas (PoWPA)* (Decision X/31) in particular: Goal 1.2: To integrate PAs into broader land and seascapes and sectors so as to maintain ecological structure and function; Goal 2.2: To enhance and secure involvement of indigenous and local communities and relevant stakeholders; 3.1: To provide an enabling policy, institutional and socio-economic environment for PAs; Goal 3.2: To build capacity for the planning, establishment and management of PAs; Goal 3.4: To ensure financial sustainability of PAs and national and regional systems of PAs; Goal 4.1: To develop and adopt minimum standards and best practices for national and regional PA systems; and Goal 4.2: To evaluate and improve the effectiveness of PA management. The project's emphasis on strengthening mangrove PAs is also consistent with Ramsar Resolutions VII.21 on *enhancing the conservation and wise use of intertidal wetlands*, and VIII.32 on the *conservation, integrated management, and sustainable use of mangrove ecosystems and their resources*.

Rationale and summary of GEF Alternative

89. In the baseline scenario, significant past losses of natural habitats and species declines have occurred in Hainan, leaving fragmented remnants that are vulnerable to the impacts of continuing rapid economic development, intensive resource use and other environmental change. While there has been significant investment in the PA system and mangroves in Hainan, this has not yet addressed the principal barriers to the development of a sustainable and effective PA system, and funding remains inadequate to cover the operational costs required to achieve biodiversity conservation objectives. As a result, biodiversity continues to be lost inside the PAs due to the combination of weak management capacity and persistent or increasing levels of threat. In common with the general national situation, there has been little or no mainstreaming of ecosystem services into land uses, development planning and sectoral planning. This situation allows external threats arising from incompatible land uses to affect protected areas and biodiversity outside the protected area system. Urgent action is needed to prevent further degradation of critical coastal wetland ecosystems and the loss of biodiversity and ecosystem services.

90. In the GEF alternative, the project aims to address the principal barriers identified in the situation analysis through a systematic approach at different levels of organization in order to strengthen the management effectiveness of Hainan's PA system. The global and national biodiversity significance of Hainan's PA system, owing to its tropical location in the Indo-Burmese Biodiversity Hotspot with additional island endemism values, the nature and severity of on-going threats to the PA system and the persistence of important barriers limiting its effectiveness have led the Government to prioritise and present this project for GEF support. In particular the GEF project will provide significant direct assistance towards realizing the provincial government's plans to increase the terrestrial PA System from the current 8.4% to 11.79% of land area by 2025, as well as increasing mangrove areas associated with PAs by 25% by 2017.

91. The project will contribute to the objective and outcomes by creating a strong provincial system for managing the PA system and the sub-system of mangrove PAs, improving the spatial design of the PA system and extending its scope by at least 40,000 ha in line with the Hainan PA System Master Plan, ensuring better terrestrial ecosystem representation and filling ecosystem coverage gaps. As Hainan Province is largely an island, the whole island can be regarded as a catchment system, the project therefore focuses on terrestrial wetland PAs including catchment PAs inland and mangrove PAs along the coast. This will increase the resilience of the sub-system in the face of a fast changing climate by maintaining representative samples of different forest, grassland and wetland types, with gradients in altitudes and increased connectivity between core areas. This will allow the gradual redistribution of component species of different wetland ecosystems and ensuring adequate protection of upstream non-wetland habitats such as forests and grasslands that serve as vital catchments for the wetlands themselves. The project will improve functioning of existing and new PAs, by strengthening its management effectiveness through improved monitoring and law enforcement, establishment of model buffer zones, development of co-management arrangement with community participation. Valuation of key ecosystem services and local resource use will underpin piloting of eco-compensation schemes to improve the sustainability of PA management. The project is designed to reduce threats by integrating wetland PA objectives into tourism plans and establishing standards for tourism development and operation, while also addressing other sectoral pressures notably from coastal aquaculture practices.

PROJECT GOAL, OBJECTIVE, OUTCOMES AND OUTPUTS/ACTIVITIES

92. **The project goal is:** to contribute to the conservation and sustainable use of globally significant biodiversity in Hainan Province, China. **The project objective is:** to strengthen the management effectiveness of the wetland protected area system in Hainan in response to existing and emerging threats to the globally significant biodiversity and essential ecosystem services. The focus of the project is to strengthen Hainan's PA system to ensure the protection of a representative sample of its exceptionally rich and unique biodiversity and to more effectively manage the wetland PA subsystem.

93. In order to achieve the above objective, and based on a barrier analysis (see Section I, Part I), which identified: (i) the problem being addressed by the project; (ii) its root causes; and (iii) the barriers that need to overcome to actually address the problem and its root causes, the project's intervention has been organised into three inter-connected components. **Component 1** addresses the spatial, regulatory, institutional and financing deficiencies of the PA system at the provincial level, in order for the provincial government to be able to better conserve biodiversity on the island through the PA system, and to support the individual PAs as well as the mangrove PA network which is developed under Component 2. **Component 2** aims to bring about significant and fast improvement to the management of all the mangrove PAs (which also represent other types of coastal ecosystems) on the island by jointly tackling the common issues and threats to these PAs as a group and individually. In direct support of component 2

and 1 to some extent, **Component 3** tackles the underlying causes of the external threats to the mangrove PAs and to the PA system as a whole, through mainstreaming of wetland PAs in development and sector planning and operational frameworks. In turn, mainstreaming as well as strengthened capacity at the provincial level under component 1 and 3 will be applied at the site level under component 2.

94. The three components will result in the following project outcomes:

1) *Expansion, consolidation and strengthening of the provincial PA system.* This will be achieved through support for the development and implementation of the provincial PA system strategy and action plan, in the form of a wetland PA subsystem strategy and action plan, climate change resilience plan, with specific attention given to the mangrove PA subsystem and support for operationalization of new PAs; a financing plan for the PA system that addresses identified financing gaps and widening the range of available sources informed by demonstrated sustainable financing at site level; development and operationalization of provincial guidelines and regulatory recommendations for management and zoning of coastal wetland PAs; and strengthened supervisory capacity of HFD and related agencies for planning and monitoring wetland PAs.
2) *Development of a Mangrove PA Network,* through mechanisms for coordination between mangrove PAs including the introduction of shared management approaches and tools such as monitoring ecosystem health, information sharing, technical exchanges, and collaboration on common issues; significant enhancement of site level management capacity through training on key issues such as law enforcement and monitoring, and introduction of professional compentency standards. Demonstration interventions will be undertaken to develop model management plans, strengthen model buffer zones, establish co-management and sustainable livelihood programmes including mangrove replanting and appropriate nature-based tourism, supported by awareness programmes informed by economic valuation of ecosystem services.
3) *Strengthening of the PA System Management Framework,* through improved inter-sectoral coordination with key sectors related to wetland PAs, related capacity building and embedding of coastal wetland conservation concerns into cross-sectoral and individual sector plans. This will include the development and testing of sector-specific standards and safeguards to protect wetland PAs from sectoral practices. Economic valuation of ecosystem services will be used inform public opinion about the values of wetland PAs and economic consequences of their loss and degradation, with the intention of mainstreaming wetland PAs and PA system concerns into the 13th Five year Plan for Hainan. Economic valuation and mainstreaming will also aim to underpin increased government financing for PA operational budgets. An online wetland PA data sharing platform will provide enhanced access to information for planners, managers and other stakeholders. Lessons will be upscaled through the CBPF MSL programme to other projects and wetlands.

95. In addition, implementation of the project is supported by monitoring and evaluation inputs in order to achieve effective project management based on results-based management. In addition, implementation of the project is supported by monitoring and evaluation inputs in order to achieve effective project management based on results-based management. As an integral component of the CBPF MSL Programme, this project follows a similar approach and structure to other MSL provincial projects and in particular the national-level project, by adopting national nature reserve staff competencies standards, Ecosystem Health Index (EHI) methodology, wetland data management and sharing platform.

96. The project's Stakeholder Involvement Plan (see **Part IV**) provides details of stakeholder organizations and their roles in project implementation, including mechanisms for the participation. This includes provincial level agencies concerned with the governance and delivery of ecosystem services from the PAs such as HLERD, HMFD and HWRD; other agencies concerned with development planning and sectoral development (Hainan Tourism Committee, provincial Development Reform Committee,

Hainan Finance Department, Agriculture Department, etc); local government and nature reserve management offices; local community representatives involved in co-management interventions; and institutions providing technical expertise such as provincial universities and technical institutes, environmental NGOs involved in bird monitoring, etc.

97. Activities under the three outcomes will be focused at three levels of intervention: (i) the provincial level, through working with provincial government agencies to develop the systemic, institutional and individual capacity to revise, plan and effectively supervise the PA system; (ii) at the protected area level, by enhancing staff management capacity for selected PAs, and supporting a range of demonstration activities including site management planning, mangrove restoration, model buffer zone establishment, etc; and (iii) at the local level, through working directly with selected stakeholder groups and local communities on the implementation of PA co-management, alternative livelihood and awareness activities.

Outcome 1: Improved protection and management of Hainan's ecosystems through expansion, consolidation and sustainable financing of the provincial PA system

(Total cost: 5,530,000 US$; GEF 380,000 US$; Co-financing 5,150,000 US$)

98. In order to remove Barrier 1 (insufficient PA coverage and systemic and institutional capacity at provincial level), the project will support the development of a Wetland PA Strategy and Action Plan and Climate Change Resilience Plan. According to a recent PA system review[21], whilst the entire PA system and management need strengthening, Hainan should especially enhance protection in the north and northeast plains and coastal regions which are under severe threat. The system consolidation strategy development will include concern for protection of representative wetlands[22], their vital water catchments and also include consideration to adaptation to changing climate. The project will also support development of financing plan for the expanded Hainan PA system including a disaggregated section on the mangrove PA subsystem. This will seek to diversify sources of sustainable financing for the provincial PA system, informed by demonstration activities at site level. Initial implementation of the action plan to expand the PA system and the financing plan to increase investment in the PAs will also be supported.

99. In addition, the capacity of Hainan Forestry Department and related agencies for ensuring the management effectiveness of the provincial PA system will be strengthened. This will include the development and operationalisation of provincial guidelines and improvements to regulations for management and zoning of coastal wetland PAs, based on management experiences in Dongzhaigang and other coastal PAs. These guidelines will directly inform the set of national guidelines to be developed under the national level project within the CBPF-MSL Programme. Supervisory capacity of the provincial forestry department and site managers for planning and monitoring wetlands PAs and Ramsar sites will be strengthened through strategic training activities and adoption and application of a set of professional competency standards for wetland PA management staff as a basis for enhanced performance, in-service

[21] Wu R, Ma G, Long Y, Yu J, Li S & Jiang H. 2011. The performance of nature reserves in capturing the biological diversity on Hainan Island, China. Environ. Sci. Pollut. Res. DOI 10.1007/s11356-011-0440-5.

[22] The second national wetland inventory assessment is currently in progress for Hainan province. Results were not available during the PPG, but will be important to inform the development of the PA system to ensure that all natural wetland types and key biodiversity features such as egret colonies and shorebird concentrations are represented. These representative wetlands can be sandy coast, muddy coast, mangrove, rice fields, salt pans, reservoirs, ponds, upland swamps, etc. It should be also noted that climate and landform differences around the island vary, therefore an eastern estuary may be very different from a western part, and from south to north.

training and career structure. The Hainan Forestry Department's capacity for providing adequate support for an ecosystem specific (mangrove) PA networking approach will also be a focus of the training activities.

100. The expected conservation outcomes of this component will be an expanded and strengthened, climate-resilient PA system with improved coverage of under-represented habitats including full representation of the province's natural wetland types and key wetland biodiversity features; and strengthened capacity of HFD and related agencies for management of the PA system. The outputs necessary to achieve this outcome are described below.

Output 1.1 PA system consolidation, expansion and sustainable financing

101. This output will directly contribute to the consolidation and expansion of Hainan's PA system through three linked activities.

102. The first step will be the development of a Wetland PA Strategy and Action Plan and Climate Change Resilience Plan. The PA system includes multiple jurisdictions, under the combined oversight of the Hainan Forestry Department (HFD), the Hainan Land Environment and Resources Department (HLERD) and the Hainan Marine and Fisheries Department (HMFD). In addition, agrobiodiversity (e.g. wild rice varieties, logan and tea) fall under the Hainan Agriculture Department. This project focuses on the terrestrial PA system, also including the intertidal zone (which is generally under HMFD except for mangroves, which are covered by HFD). The project also has a strong focus on the wetland PA subsystem, which requires a catchment management approach to achieve effective integrated wetland management and therefore involves the Hainan Water Resources Department. Therefore a collaborative approach involving these key agencies is required to develop the PA system consolidation strategy and action plan, as well as consultation with provincial and local planning, land use and related sectoral agencies. Through both the strategy and action plan here as well as PA mainstreaming in Component 3, the project aims to reinforce information, communication and knowledge sharing, so that government agencies can integrate their human and financial resources towards agreed objectives through their own mandates.

103. Under the Ministry of Environmental Protection, the PA strategy and action plan has been completed at national level (2012-2020). MEP has requested each province to complete their provincial Strategy and Action Plan for the PA system, which HLERD is leading on with input from HFD and HMFD, identifying proposals for new PAs, and plans for upgrading existing PAs. Therefore, this project will develop a strategy and action plan for the wetland PA system and to propose measures to strengthen the provincial PA system's climate change resilience, to complement the overall draft Master Plan for Nature Reserves in Hainan Province (2011-2016).

104. HFD is currently writing up the results of the second wetland inventory assessment following a generic methodology, including a general investigation for all wetlands plus comprehensive surveys for nature reserves, wetland parks and forestry parks. Based on these results, the project will support the development of a detailed Wetland PA Strategy and Action Plan and Climate Change Resilience Plan that will:

105. (i) address weaknesses in the representation of different habitats and natural features in the PA system which were identified during a recent review[23] - especially to enhance protection in the north and northeast plains and coastal regions, and to expand representation of mangroves and other wetland types, based on the outcomes of the second national wetland inventory assessment. This will address coverage

[23] Wu R, Ma G, Long Y, Yu J, Li S & Jiang H. 2011. The performance of nature reserves in capturing the biological diversity on Hainan Island, China. Environ. Sci. Pollut. Res. DOI 10.1007/s11356-011-0440-5.

of the vegetation type targets specified in the first Objective indicator of the Strategic Results Framework (although this is in need of updating once more recent information becomes available).

106. (ii) incorporate catchment protection into the design of the PA system in order to secure adequate flows of good quality water to downstream wetlands. This requires coordination with the Hainan Water Resources Department, whose main goals are to sustain water availability and good water quality, and avoid over-exploitation. The project will make recommendations for the integration of key conservation interests into their main plans: a) Water functional zonation plan; b) Headwater conservation plan; and c) Water development plans under the 12th 5 Year Plan. Inter-sectoral communications and information sharing mechanisms will also be developed in Component 3 to facilitate a more integrated approach catchment management.

107. (iii) incorporate climate change adaptation considerations into PA system design. These should be based on an assessment of anticipated climate change impacts on Hainan's ecosystems, habitats and key species, drawing on international reviews and guidance[24], and local information. The goal will be to increase the resilience of the PA system to sustain biodiversity in the face of forecast climate change impacts, including such measures as maintaining habitat continuity across altitude gradients and across the intertidal and coastal strip as far as possible, protecting or restoring habitat corridors that link individual PAs, and extending model buffer zones. The PA system's values for disaster risk reduction should be set out as part of the rationale for the adaptation planning, so that hazards to local communities are mitigated through ecosystem-based adaptation measures such as coastal protection belts, retaining forest on hillslopes to reduce landslide risks, and wetlands to absorb floodwaters.

108. Secondly, a PA system financing plan will be developed for the expanded PA system including a disaggregated section on the mangrove PA system. The development of such a financing plan is a critical step for approaching the provincial and national government for the required resources. It will cover both developmental costs (such as establishing new nature reserves, developing reserve headquarters buildings and protection stations, etc) as well as the operational costs to achieve management goals. The financing plan should be medium term, consistent with the draft PA Master Plan and related project-generated plans including the proposed Wetland PA Strategy and Action Plan and Climate Change Resilience Plan. In view of the period needed to implement the development of the PA system, the significant financial resources required, and inputs from different sources, the plan will prioritize resource allocation based on the urgency of conservation and socio-economic needs, and existence of financing opportunities (e.g. related to synergies with other plans and financing mechanisms).

109. The development of the financing plan will aim to address the financing gap for the Hainan PA system (see financial sustainability scorecard worksheet in **Annex 1**), specifically seeking to widen the range of financing sources available to support PA management, increase the financing available to support the operational needs of individual PAs, and take account of the demonstration of sustainable financing mechanisms, as follows.

110. At provincial level, mechanisms for incorporating new funding sources from eco-compensation initiatives and new financing investments from the public and private sector such as nature-based tourism companies will be reviewed. Economic valuation (see **Output 3.3**) and mainstreaming will be geared towards increasing government financing in order to provide adequate operational budgets for wetland PAs to enable their effective management. This will be done by enhancing the principles and processes for budgeting at both national (through the national project under the CBPF MSL programme) and

[24] For example, de Sherbinin, A., Lacko, A., and Jaiteh, M. 2012. *Evaluating the risk to Ramsar Sites from climate change induced sea level rise.* Ramsar Scientific and Technical Briefing Note No. 5. Gland, Switzerland: Ramsar Convention Secretariat. www.ramsar.org/bn/bn5.pdf

provincial levels, developing innovative funding mechanisms from the government eco-compensation schemes and private sector investments and by integrating wetlands conservation activities inside other ongoing development programmes of the government.

111. At the site level, the economic analysis in **Output 3.3** will be accompanied by the identification of sustainable financing options for wetlands at Dongzhaigang linked to a land use study, and supported by a high level overview for the provincial wetland network. In the case of Dongzhaigang, this would explore the potential for (i) eco-compensation for converting (unprofitable) aquaculture ponds back to mangroves; (ii) Carbon financing ("blue carbon") from mangrove forests and soils; (iii) ecotourism development associated with mangrove protection and restoration. The development of a wetland park by Haikou City Government adjacent to Dongzhaigang NNR will provide a case study for a mechanism of sustainable financing to the reserve in the form of payments to the reserve and other potential benefits under an agreement with the developers. The detailed design of the sustainable financing mechanism to be demonstrated at Dongzhaigang will be undertaken during the full project based on the results of the mentioned studies, and in line with STAP guidance documents[25].

112. The data collection and analysis conducted to develop the sustainable financing mechanism will be incorporated into a site business plan for Dongzhaigang NNR. The business plan will build on an updated site management plan (see **Output 2.4**) which assesses and describes the conditions of the site; evaluates current and projected needs and threats; and develops strategies and plans for specific activities to address those threats. The site business plan focuses on the last component and identifies the amount of financing required in a long-term financial plan required to implement the activities in the management plan; and the potential revenue sources to meet those needs (including cost savings). Ideally the business plan should be developed in parallel with the site management plan, as they influence each other. A small team should be tasked with developing the business plan, including the PA Manager, government resource agency representatives (HFD, HDF), Financial Officer, Fund Raising Director, Management Planning Team (or a subset of this group).

113. The project will also draw on experiences by the UNDP/GEF Project Biodiversity Management in the Coastal Area of China's South Sea under its Output 2.3 on *Sustainable financing and the effective use of economic instruments are demonstrated at Sanya Coral Reef NR*, which aimed to apply polluter-pays and user-pays principles to the financing of the NR, including user fees and "internalizing" penalties related to ecological damages such as those arising from anchors on coral, illegal sewage or waste discharges from boats, etc. These include the ongoing agreement under which private sector operators provide various types of support (compliance monitoring, equipment, etc.) for MPA management under the terms of their licensing agreement. The requirement for water use fees to cover the costs of sewage treatment is another example. Such instruments will provide an economic incentive to reduce pollution levels. Work will also be carried out to ensure retention of revenues for local conservation purposes and will build the capacity of local institutions to manage and utilize the funds. In the case of mangrove reserves, capturing tourism-related revenues has significant potential for a number of reserves, although the bureaucratic mechanism for capturing user fees is reportedly cumbersome and a constraint on applying this approach. The project would therefore review possibilities for streamlining this in order to

[25] STAP. 2010a. Payments for Environmental Services and the Global Environment Facility: A STAP advisory document. http://www.thegef.org/gef/sites/thegef.org/files/publication/STAP_PES_2010.pdf

STAP. 2010b. The Evidence Base for Community Forest Management as a Mechanism for Supplying Global Environmental Benefits and Improving Local Welfare: A STAP advisory document http://www.thegef.org/gef/sites/thegef.org/files/publication/STAP_CFM_2010.pdf

internalize revenues related to entry fees in a cost-effective manner, as well as reviewing other mechanisms such as annual payments to reserves by tourism companies for access to designated areas.

114. Thirdly, the project will support the initial implementation of the Hainan PA Master Plan and financing plan, including the operationalisation of PA functions in selected newly designated areas with relevance to the project's emphasis on wetland conservation, including boundary demarcation, signage and management bases. At least 40,000 ha of additional PA coverage will be supported with co-financing by HFD. The existence of a comprehensive strategy and action plan and financing plan will enable the allocation of the resources needed to effectively manage the PA system through agencies such as NDRC and HDF, in line with national and provincial policies for environmental protection, and Hainan's "Green Island" policy for tourism promotion purposes. Therefore, the project will facilitate promotion of the plan with all levels of government, and coordination with central planning and financing authorities.

115. Plans for the creation of new PAs should ensure compliance with relevant provisions of the UNDP Environmental and Social Screening Procedure pertaining to access to natural resources and changes in land tenure and land use rights, especially concerning any indigenous / ethnic minority groups resident in these areas.

Output 1.2 Provincial guidelines for management and zoning of coastal wetland PAs

116. Provincial guidelines will be developed and operationalized for the management and zoning of coastal wetland PAs, providing a tailored approach to address specific threats and informing the development of national guidelines under the National Project of the CBPF-MSL programme. These guidelines will build on the results of the ACEDP project (see table on related projects in **Section IV, Part IV**) on guidelines for management planning and monitoring of Ramsar Sites, including management experience at Dongzhaigang and other coastal wetland nature reserves[26] as well as related international experience[27]. They will also consider more proactive application of the "Overall Land Use Plan of Hainan Province with Biodiversity Conservation (2006-2020)" and associated technical guidelines for counties to incorporate biodiversity in land-use planning and for Environmental Impact Assessment on Land Consolidation as developed and approved by the Department of Land, Environment and Resources.

117. The guidelines will take account of Hainan's specific situation in terms of coastal ecosystems, habitats and biodiversity; coastal land and resource uses; and the types of threats impacting coastal PAs, including organic pollution and nutrient enrichment from aquaculture pond wastewater in line with the STAP advisory document[28]. They will set out conservation principles (such as the ecosystem approach and precautionary principle embodied in CBD), needs for coastal climate change adaptation and mitigation measures, and the institutional framework for management of coastal resources. The guidelines will then describe management responses to a range of management issues influencing coastal PAs, the agencies involved, and sources of technical advice and assistance.

118. Associated with developing the guidelines, the application of Regulations on Nature Reserve Conservation in Hainan Province will be reviewed to encourage reserves to scientifically plan their zones and set aside some areas as development areas to attract developers to generate revenue for reserves, as

[26] Kiri-ganai Research Pty Ltd in association with Wetlands International – Oceania and the State Forestry Administration of China. 2011. Dongzhaigang. Review Workshop for the Ramsar Guidelines. Milestone Report. September 2011. Australia – China Environment Development Partnership (ACEDP) 2007-2012 Wetlands Management Policy Guidelines & Capacity Building Project.

[27] For example: UNEP (2011): Taking Steps toward Marine and Coastal Ecosystem-Based Management - An Introductory Guide.

[28] STAP. (2011). Hypoxia and Nutrient Reduction in the Coastal Zone. Advice for Prevention, Remediation and Research. A STAP Advisory Document. Global Environment Facility, Washington, DC.

current articles in the regulation leave narrow space for reserves to develop and increase revenues. Regulations on Wetland Conservation in Hainan Province will also be reviewed to propose and enact new articles that might help to solve the problem that wetlands are managed by different governmental agencies with sector-specific regulations but with limited coordination.

119. In order to capture experience from the mangrove PA network (see **Component 2**) and related sectors, the guidelines and regulatory improvements should be developed through a participatory process involving a series of stakeholder workshops, convened by a working group which will coordinate the drafting process. This process will not only result in guidelines that are recognised and accepted by a range of sectors, but will also raise awareness of the conservation issues involved and need for inter-sectoral collaboration to resolve them in many cases, supporting the PA mainstreaming activities in **Component 3**. Therefore the emphasis will be on ensuring that the development process is well structured and involves the key sectors influencing coastal wetlands, in order to achieve a strong understanding and buy-in to the resulting guidelines.

Output 1.3 Strengthened PA system supervisory capacity

120. This output will strengthen the supervisory capacity of Hainan Forestry Department, Hainan Environment Land and Resources Department and Hainan Marine and Fisheries Department for planning and monitoring wetland PAs and Ramsar Sites as well as supporting a Mangrove PA Network approach, through strategic training activities and adoption and application of a set of professional competency standards for wetland PA management staff. It will result in increased institutional capacities as measured by the UNDP Capacity Assessment Scorecard, for which baseline scores are presented in **Annex 2**. In view of the project's focus on wetland protected areas, and particularly the mangrove PA network in Component 2, capacity building will be mainly directed towards HFD, but will include the related agencies regarding broad PA planning, oversight and monitoring issues for example. Capacity building for the staff of individual mangrove PAs will be covered under **Output 2.2**, taking account of the wider institutional level support under the current output, and close coordination of the delivery of these two outputs is required during project implementation to ensure management efficiency.

121. The project's approach towards adopting professional competency standards follows those advocated for protected area jobs in SE Asia by the ASEAN Regional Centre for Biodiversity Conservation (ARCBC), which developed a book of standards[29] for 24 key protected areas jobs, divided into 17 technical categories and five levels. They were developed through a review of best practice in the ASEAN region and are intended to be adapted as required to meet specific national requirements and training and development contexts[30].

122. A key principle is that the standards are not prescriptive, but are intended to provide a recommended level of competence, and should be adapted and used according to the specific need and context. The standards can support capacity development for protected areas in the following main ways:

- Providing a clear description of best practice, based on real regional experience.
- Providing a common language of skills, enabling inter-agency communication and collaboration and improving transboundary and international cooperation.

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[29] Appleton, M. R., Texon, G.I. & Uriarte, M.T. (2003) Competence Standards for Protected Area Jobs in South East Asia. ASEAN Regional Centre for Biodiversity Conservation, Los Baños, Philippines. 104pp. Available at http://www.cbd.int/protected/tools/ . This is now available in Chinese through the UNDP CO.

[30] For further information, see the ARCBC website www.arcbc.org.ph

- Defining functions, job descriptions, terms of reference and forming the basis for appraisals and performance assessments.
- Developing a more performance-based focus for training and development.
- Designing training needs assessments, training strategies and programmes and for developing, delivering and assessing in-service training.
- Revising tertiary education programmes and syllabi and designing new courses at universities and colleges.
- Encouraging institutional ownership of training, enabling Protected Area Authorities to specify more clearly to donors and partners what their training requirements and gaps are.
- Improving recognition of the complexity and importance of 21st century PA management, encouraging and demonstrating improved professionalism and helping to secure more resources.
- Providing the basis for potential future accreditation of training institutions, agencies, organisations and individuals which use and/or achieve the standards.

123. The project will form a small working group involving HFD, HLERD and HMFD management staff to review the standards and develop recommendations for their application towards improving professional competencies for the provincial protected area system through their institutionalization and long term use. The project will provide support for adoption of the professional competency standards, including reviewing and advising on job descriptions, and providing training using external providers to address immediate short term needs for implementation of technical activities, such as monitoring and evaluation for the PA system strategy and action plan.

Outcome 2: Strengthened protection, participatory management and restoration of mangrove forests through the development of a Mangrove PA Network.

(Total cost: 9,067,271 US$; GEF 1,729,271 US$; Co-financing 7,338,000 US$)

124. **Outcome 2** responds to Barrier 2 – limited tools and capacities for wetland PA management. Building directly on the recent passage of the provincial mangrove protection regulations, the project will invest a significant portion of the GEF funding in the development of an effective *Mangrove PA Network,* as the main type of natural lowland wetland which is also under intense development pressure. It will aim to dramatically enhance their site level management activities, in particular law enforcement and monitoring, and set up mechanisms for coordination between mangrove sites including sharing data, technical exchanges, sharing of species (for replanting and re-introduction in habitat restoration). A standardized system of monitoring ecosystem health using the EHI developed under the CBPF-MSL programme will be applied to network sites (see **Annex 3**). Sector specific standards and safeguards (developed under **Component 3**) will be applied to the NRs within the network, reducing threats to the PAs.

125. The PA network development approach aims to establish a model for an ecosystem-type specific approach to strengthening the PA system given the common threats these PAs share. The intention is for this approach to be replicated by the province to support PAs covering other ecosystem types within the province (such as tropical evergreen lowland forest, grasslands, seagrass beds and coral reefs) leading to the strengthening of the entire PA system in Hainan. It is further expected to contribute to strengthening mangrove PA management in other provinces in China.

126. Demonstration management interventions will be undertaken at a subset of the Mangrove PA Network sites, including Dongzhaigang NNR, Qinglangang PNR, Dongfang PNR and Xinying NWP. These will aim to achieve tangible site level management improvements within the project period using

approaches that can be transferred to other network sites and PAs. These demonstration actions will include the development of model NR management plans for Dongzhaigang NNR, Qinglangang PNR and Dongfang PNR, which will be in line with the mangrove regulations and provincial guidelines for management and zoning of coastal wetland PAs (to be developed under component 1). Model buffer zones will be established in Dongzhaigang and Qinglangang, complemented by restoration of abandoned shrimp ponds back to mangrove forest; together with development of a wetland park at Dongzhaigang on reclaimed pond areas. In addition, the protection status of Yinggeling PNR (catchment forest) and Fanjia PNR (inland lake/swamp-forest) will be the demonstration area of PNR, Changjiang Haiwei Wetland Park (>300 ha) is planned for upgrading to Provincial Wetland Park, and Sanya mangrove City NR complex will be upgraded to the demonstration area of NR so as to ensure larger budget allocation and intensification of conservation activities.

127. The project will apply the provincial professional competency standards for wetland PA management in the mangrove PAs, including strategic training for key NR management functions and to respond to identified threats. Furthermore, the project will pilot introduction of co-management schemes whereby local villagers become more responsible for protecting and restoring some degraded wetland areas and PAs. In other areas pressures on wetland resources due to over-harvesting or over-disturbance will be reduced by introduction of alternative livelihood ventures related to eco-tourism opportunities offered by the great increase of tourism to the islandAs a foundation for causing this, the project will support a province-wide wetland PA awareness campaign, with clear linkage between the wetland conservation issues and ecosystem services, health and local economies including handbook for decision makers, publications, media coverage, blogs, campaigns, and outdoor events. The campaign will have targeted outcomes of co-management scheme development and sustainable financing mechanisms development, making full use of economic arguments for conservation.

128. The expected conservation outcomes of this component include expanded coverage of mangrove forest within and adjacent to the Mangrove PA Network sites as a result of improved protection, more effective management including expanded model buffer zones, and replanting efforts involving local communities. In addition, strengthened management effectiveness will result in improvements in the ecosystem health of the network sites as monitored using the EHI system, and increased site usage by conservation target species such as the globally endangered Black-faced Spoonbill *Platalea minor*. The outputs necessary to achieve this outcome are described below.

Output 2.1 Mangrove PA Network established and recognized in PA system plans

As the principal output under this component of the project, a *Mangrove PA Network* will be established and recognized in PA system plans. This approach aims to significantly enhance site level management activities, with enhanced law enforcement and monitoring capacity of individual PAs, coordinated management and monitoring activities, shared data and information base (through the online platform in **Output 3.4**), technical exchanges, and shared provision of mangrove species for replanting and re-introduction in habitat restoration. Dongzhaigang has initiated an online Mangrove Forum that provides a foundation for such sharing of information: http://www.mangroves.org.cn/e/bbs/index.asp

129. Sector specific standards and safeguards (developed under **Output 3.2**) will be applied to the NRs within the Mangrove PA Network through coordination with the related provincial and local government agencies with the aim of reducing specific threats to the PAs arising from the impacts of sector-led practices (such as aquaculture and agriculture development, types of gear and methods used for fishing, siting of tourism facilities, infrastructure development, sewage disposal, etc).

130. This shared PA network approach aims to establish a model for an ecosystem-type specific approach to strengthening the PA system given the common threats these PAs share, and the common management measures required to respond to these threats. This approach is both cost-effective in that staff from multiple PAs can follow the same training programmes, and synergistic in that they can share experiences and combine resources for more efficient problem solving.

131. The mangrove PA network will be linked to centres of expertise on the mangrove environment (local universities such as Hainan University, Hainain Normal University, Research Institute of Tropical Forestry (CAF), and the Hainan Marine Development & Design Institute) as well as mainland institutions such as Tsinghua University in Beijing, in order to provide stronger technical support to individual PAs and raise the management capacity of the whole network. The same approach has potential to contribute to strengthening mangrove PA management in other provinces in China through upscaling and extension.

132. This approach has potential for replication for other ecosystem types within the province (such as tropical evergreen lowland forest, grasslands, seagrass beds and coral reefs) leading to the strengthening of the entire PA system in Hainan, and providing a mechanism for engagement of local academic expertise as well as networking among the related PAs.

Output 2.2 Professional competency standards applied to staff of Mangrove PA Network Sites

133. Baseline METT results for mangrove PAs (see **Annex 1**) and capacity assessments of provincial agencies responsible for the PA system (**Annex 2**) clearly indicate the need for increased capacity for PA management and related technical subjects. Therefore professional competency standards for wetland PA management will be applied to staff of mangrove PAs, and strategic training provided in key subjects to support basic NR management functions and response to identified threats. These will be based on a training needs analysis and training action plan for the mangrove PA network sites to be conducted in the first year of the project.

134. While the current output specifically concerns the Mangrove Protected Area Network (MPAN) sites, it will take account of the wider institutional level support for the PA system under **Output 1.3**, and close coordination of the delivery of these two outputs is required during project implementation to ensure management efficiency.Therefore, the training needs analysis will be combined with the professional competency standards for PA jobs (see **Output 1.3** for details) in order to define priority subjects for training provision by the project. Based on the preliminary information obtained from the METT and Capacity Development Scorecard baselines during the PPG, priority training subjects are likely to include: law enforcement, stakeholder participation and community co-management, conflict management, visitor management, environmental monitoring (a range of EHI parameters), tourism control, extension work, monitoring and control of alien invasive species, mangrove restoration, etc. Dongzhaigang NNR will provide the main base for delivery of training for the MPAN sites, as well as overall coordination of the network. Training at Dongzhaigang will be supplemented by field exercises at other sites in order to build the network concept and to share experiences between the reserves.

Output 2.3 Ecosystem Health Index monitoring introduced for Mangrove PA Network sites, supported by applied research

135. A standardized system of environmental monitoring using the Ecosystem Health Index (EHI) developed under the CBPF-MSL programme[31] will be introduced systematically at all network sites, supported by associated capacity building and information management. Under the EHI system,

[31] MacKinnon J. 12 July 2012. Draft Ecosystem Health Index (for wetland sites under Main Streams for Life Program)

"ecosystem health" is taken to be the suitability of a site to continue to provide secure conditions for survival of component species and delivery of key ecological services, including resilience to climate and other changes. The EHI itself is not an evaluation, but a dynamic, constantly varying index that reflects biodiversity health, just as a financial index reflects economic performance. It has the following uses:

- EHI provides a baseline against which targets for maintaining or achieving a given level of health can be set;
- EHI can be used as a results based indicator of project achievement and impacts;
- EHI can indicate where the project is succeeding or failing and allow revision of activity efforts throughout the project;
- EHI is complimentary to the Management Effectiveness scorecard in project M & E.

136. EHI baselines have been established for three demonstration sites during PPG (Dongzhaigang NNR, Qinglangang PNR and Xinying NWP), and will be completed for the remaining Mangrove PA Network sites in Year 1 (see EHI baselines in **Annex 3**). Implementation of site monitoring protocols to obtain EHI scores (e.g. see EHI monitoring protocol for Dongzhaigang in **Annex 3B**) will be progressively enhanced through staff training related to specific monitoring parameters including identification and surveillance of indicator species, habitat condition, water supply, water quality, etc.

137. Through the Mangrove PA Network, the PAs would be linked with universities and institutes with various interests in environmental research (see Output 2.1 above). A number of academic institutions have conducted studies at these sites, some of which are long-term ongoing studies which have already informed reserve management on certain issues (including changes in mangrove benthic communities associated with water quality, etc). For instance, the Institute for Tropical Forestry has worked at Dongzhaigang for over 25 years, with an established ecological research station, 16 permanent research plots, a meteorological station, and four observatory stations for monitoring ecosystem services, including wind/typhoon prevention, change of tide and ebb, disaster mitigation, etc.

138. By defining the research and monitoring needs for the mangrove PAs more precisely, the reserves would be able to access technical expertise through the network through collaborative research and continuing professional development arrangements. Consultations during the PPG indicated existing work and interest in subjects including developing ecologically friendly aquaculture and farming practices for model buffer zones, in managing mangrove pest problems such as the crustacean wood borer *Sphaeroma,* in improving mangrove restoration techniques, monitoring trends in coastal fish populations, monitoring and assessing impacts of exotic species, carbon sequestration in mangrove soils, pollution by heavy metals, and design of coastal protection belts.

139. The project will facilitate the coordination of such collaborative research by establishing a mangrove research working group, developing collaborative projects aligned with NR management priorities, and making information available though the online database (see **Output 3.4**), on the basis that the actual research programmes will be co-financed by the partners involved. Preliminary information during the PPG indicates interest in establishing carbon flux monitoring stations in mangroves at Dongzhaigang and Qinlangang. The high quality mangrove forest in Qinglangang's Bamen Bay core area is very suitable as the location for a research station to establish a benchmark for Chinese mangrove ecology and conservation management.

Output 2.4 Improved management planning and strengthened buffer zones through mangrove protection and restoration for demonstration Mangrove PA Network sites

140. Model management plans will be developed for Dongzhaigang NNR, Qinglangang PNR and Dongfang PNR in line with the provincial guidelines for management and zoning of coastal wetland PAs (to be developed under **Component 1**), the guidance of the Ramsar Convention on wetland management[32], as well as the national guidelines developed by the ACEDP project and tested at Dongzhaigang[33]. In order to improve management effectiveness, the aim is to introduce participatory results-based management for the demonstration sites, including monitoring, review and updating mechanisms. Participation is an important element of the approach, including the involvement of local communities in planning processes. In the case of Dongzhaigang, the management plan would be closely linked to development of a site business plan (see **Output 1.1**), and would take account of the earlier management plan developed in 1999[34], Haikou City Wetland Conservation Action Plan (in preparation), and Haikou City tourism development plans. The plans should also overtly recognize the roles of at least Dongzhaigang and Dongfang as important flyway sites for migratory shorebirds (with reference to the East Asian – Australasian Flyway Partnership's Implementation Strategy 2012-2016[35]), as well as sites for the Black-faced Spoonbill whose conservation is coordinated through an international Action Plan[36]. Conservation work on the Black-faced Spoonbill (a charismatic bird, with popular appeal) in East Asia is one of the best examples of sustained international collaboration between government and NGO Partners, building on some 20 years of cooperation.

141. The management zones for these demonstration reserves will be described in the management plans, and reviewed and rationalized as necessary in line with operational needs to achieve management objectives. In view of the external pressures on these relatively small reserves surrounded by dense human populations, model buffer zones will be strengthened at Dongzhaigang and Qinglangang as a demonstration activity of value to other mangrove reserves. This will be accomplished by community co-management activities involving the replanting of mangroves in abandoned or unproductive aquaculture ponds linked to sustainable livelihood options including appropriate nature-based tourism. In total, the project aims to replant at least 1,000ha of mangroves across the mangrove PA network, mainly supported by cofinancing through HFD.

142. The weak recognition of nature reserve boundaries will be addressed through co-financed support for detailed surveying and demarcation of boundaries using signs / marker posts, and associated awareness raising programmes to ensure that local communities understand the regulations governing resource use inside the boundaries, the rationale for these regulations, and the reserves' interest in introducing more participatory approaches to management. The status of boundary demarcation varies between reserves, being in progress (using GPS/GIS) at Dongzhaigang although part of the boundary is contentious due to conflicting interests. The reserve boundaries for other mangrove nature reserves need

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[32] Ramsar Convention Secretariat, 2010. Managing wetlands: Frameworks for managing Wetlands of International Importance and other wetland sites. Ramsar handbooks for the wise use of wetlands, 4th edition, vol. 18. Ramsar Convention Secretariat, Gland, Switzerland.

[33] Kiri-ganai Research Pty Ltd in association with Wetlands International – Oceania and the State Forestry Administration of China. 2011. Dongzhaigang. Review Workshop for the Ramsar Guidelines. Milestone Report. September 2011. Australia – China Environment Development Partnership (ACEDP) 2007-2012 Wetlands Management Policy Guidelines & Capacity Building Project.

[34] Wetlands International-China Program, Hainan Provincial Forestry Bureau and Hainan Dongzhaigang National Nature Reserve. 1999. Management Plan for Dongzhaigang National Nature Reserve, Hainan, China.

[35] East Asian – Australasian Flyway Partnership Secretariat. 2012. Implementation Strategy 2012-2016. Adopted by the Sixth Meeting of the Partners, Palembang, Indonesia, 21 March 2012. http://www.eaaflyway.net/implementation.php

[36] S. Chan, W. H. Fang, K.S. Lee, Y. Yamada and Y. T. Yu. International Single Species Action Plan for the Conservation of the Black-faced Spoonbill (Platalea minor). 2010. BirdLife International Asia Division, Tokyo, Japan; CMS Secretariat, Bonn, Germany. 74 pages. Technical Report Series 22

to be demarcated with cofinancing support, although in some cases local communities are aware of the boundary locations.

143. At Dongzhaigang, the strengthening of the model buffer zones will be linked to opportunities related to tourism development plans under the state-owned Haikou Culture and Tourism Company[37]. These plans include three significant developments at Dongzhaigang (located adjacent to the reserve, outside the reserve boundaries), which offer strong opportunities for wetland restoration and benefits to local communities:

a. A wetland recreation centre in the North part called "Ta Se", located 200m from the reserve boundary, with mangrove replanting on saltpans to provide a model buffer zone between the centre and the reserve.
b. A "mangrove peninsula project" in the middle part, with a focus on low intensity, low impact countryside tours, using local culture and traditions and historical buildings. The City is interested to restore mangroves and connect these with existing established mangrove forest in the reserve;
c. A Polo ground in the south part near the mangroves, to provide a recreational experience in natural landscapes.

144. The project would focus on the first of these, which offers potential for some 600ha of mangrove restoration on abandoned / low productivity aquaculture ponds and fields. This would be integrated as part of the project's community co-management, alternative livelihoods and tourism guidance activities. While some of the previous mangrove restoration work at Dongzhaigang covering some 60 ha has involved use of the exotic species *Sonneratia apetala* and *Languncularia racemosa*, these species are most suitable as pioneer species on the seaward edge and are not appropriate for an inward situation such as being considered here. On principle, the project will not support any use of non-native species for mangrove reforestation, and will seek to monitor and control the spread of exotic mangrove species. The major costs involved in mangrove replanting at all demonstration sites will be covered by government co-financing.

145. At Qinglangang, strengthening of the model buffer zone for the reserve will build on Wenchang county government tourism planning for "Bamen Bay Wetland Park", located beside the reserve and which includes some mangrove forest cover. In total, some 300ha of mangroves and possibly other wetland types will be restored from aquaculture ponds, agricultural and unproductive land in and adjacent to the reserve.

146. At Dongfang, the reserve has planted some unproductive aquaculture ponds with mangroves and is enhancing natural accretion of *Avicennia marina* with planting on sheltered mudflats. It has plans to expand these planting areas by at least 50 ha through the project, and is also considering planting mangroves to protect the coastal beach ridge.

147. At Xinying, some 9 ha of mangroves have been recently replanted (2009) involving community labour. It is proposed to extend this effort to restore further unproductive aquaculture ponds to mangroves, that can be simultaneously used for extensive/sustainable aquaculture practices such as rearing crabs (as done in some parts of the reserve at present). However, the area is not expected to be large.

148. At Sanya, the relatively small existing area of mangroves (60 ha) will be expanded through restoration of at least 50 ha, with plans for developing a wetland park currently under discussion. Li

[37] Source: Stakeholder meeting with Haikou City representatives, 15 June 2012.

minority villages neighbouring this PA will be proactively considered for inclusion in demonstration activities such as mangrove replanting at this site. In addition, they stand to gain potential benefits through identification of their roles in PA management and governance to ensure equitable benefit sharing, capacity building related to sustainable livelihood practices, support for cultural practices that support environmental protection and restoration, and job opportunities related to PA management (participatory patrolling, etc) and nature-based tourism.

149. Mangrove restoration at Dongzhaigang will be done in a participatory manner linked to community co-management in line with GEF guidance on community forestry[38] as well as international guidance on replanting methods[39] and make full use of significant local experience in replanting techniques. These approaches and local expertise will be shared through the Mangrove PA Network. For each replanting site, a detailed planting plan including a technical feasibility study will be conducted before any replanting is implemented, including assessment of soil conditions, hydrology (depth and frequency of inundation), water quality including salinity, choice of suitable native species, and participatory delivery (including gender considerations) for post-planting husbandry (monitoring, pest control, replacement of dead seedlings, etc). Outcome indicators should be established for each replanting site, the CFM context, institutional and technical documentation provided for progress reports, and indicators monitored together with comparable non-CFM sites in line with the GEF STAP guidance on community forestry. All replanting plans should ensure compliance with relevant provisions of the UNDP Environmental and Social Screening Procedure pertaining to IAS (#1.3), access to natural resources (8.1), and changes in land tenure and land use rights (8.2).

150. Mangrove restoration in aquaculture pond areas will also aim to demonstrate the potential for *in situ* wastewater treatment as a means of reducing organic pollution of coastal waters in line with published research findings on integrated mangrove – aquaculture systems[40], through establishment of an appropriate experimental design for monitoring nutrient levels in relation to mangrove species cover and other variables in association with local researchers.

151. The management of the model buffer zones will be based on the model Nature Reserve Management Plans, and capacity strengthened through awareness programmes targeting specific issues and areas (through **Output 2.7**), training (through **Output 2.2**) in community participation and conflict

[38] STAP. 2010b. The Evidence Base for Community Forest Management as a Mechanism for Supplying Global Environmental Benefits and Improving Local Welfare: A STAP advisory document. http://www.thegef.org/gef/sites/thegef.org/files/publication/STAP_CFM_2010.pdf

[39] For example, see: the Mangrove Action Project http://mangroveactionproject.org/map-programs/restoration; Lewis R. & Streever B. 2000. FAO Technical Note on Restoration of Mangrove Habitat. http://www.fao.org/forestry/10559-0f0e6548b08e46a08a3d5723c354ead69.pdf; Green Coast for Nature and People after the Tsunami. Undated. Best Practice Guidelines on Restoration of Mangroves in Tsunami Affected Areas. Wetlands International, WWF, ENDS and IUCN. 22pp. http://www.wetlands.org/LinkClick.aspx?fileticket=EaD3s%2Bil5Mw%3D&tabid=56; Technical Guidelines for the Establishment of a Coastal Greenbelt. March 2007. The World Conservation Union (IUCN). Sri Lanka Country Office.

[40] Peng YS, Li XL, Chen GZ （2009） Effect of an integrated mangrove-aquaculture system on aquacultural health. Frontiers in Biology China 4:579-584.

She ZG, Lin JX, Peng YG, Chen GZ (2005). A preliminary study on mangrove and aquaculture system. Chinese Journal of Ecology 7: 837-840.

management approaches, and well as law enforcement and monitoring related to implementation of the Hainan mangrove regulation.

Output 2.5 Protection status of mangrove PAs strengthened through network

152. The project will support strengthening of the legal protection status of mangrove PAs through the network, with at least one PA upgraded from city to provincial NR (Sanya NR), and one PA designated as a Ramsar site (Qinglangang PNR). This will include completion of the necessary baseline surveys and reporting, as well as rationalization of boundaries and management zones for the selected NRs. In addition, capacity building on law enforcement and related monitoring will be provided through the MPAN, in order to reduce problems of encroachment and illegal activities within the NRs in line with the Hainan Mangrove Protection Regulation and Nature Reserve Regulations.

153. In the case of **Qinglangang**, the high quality climax mangrove forest communities including all of China's true mangrove species is clearly of international importance and worthy of Ramsar site designation. The management planning and capacity building process through this project will put in place the capacity needed for Qinglangang to meet central government standards for Ramsar Site status. While county government support remains to be secured for such a move, efforts will be made through the project to raise local awareness of the great conservation value of this site, to demonstrate how conservation and tourism development can be successfully integrated, and to increase management capacity and management effectiveness in order to facilitate the designation process.

154. In the case of **Sanya**, HFD is integrating the existing cluster of three nature reserves (Sanyahe, Qingmeigang and Tielugang NRs) administered by Sanya City Forestry Bureau into a single City level reserve – Sanya NR (728 ha). Although these reserves are small, they represent biogeographical differences in mangrove communities including the presence of an extremely rare mangrove tree in China at Qingmeigang, *Lumnitzera littorea*. The project will support capacity building for site management through the MPAN and upgrading of this site to the demonstration area of NR, including baseline surveys and monitoring, reviewing and rationalizing boundaries and management zones, capacity building for staff, enhancing site protection and enhancing existing habitats through management and restoration measures.

155. HFD will also support the upgrading of a further three wetland-related PAs, through co-financed inputs in line with their plans to expand the PA system. The details are as follows:

- Yinggeling PNR (50,464 ha) will be upgraded to NNR. It consists of tropical montane rainforest – a watershed area for Haikou, the largest intact rainforest in China with four Category I protected species, 36 Category II protected species, 15 Hainan endemic species.
- Fanjia PNR (Danzhou, >5,000 ha) will be upgraded to the demonstration area of PNR. This is an inland lake / swamp-forest area.
- Changjiang Haiwei County Wetland Park (>300 ha) is planned for upgrading to Provincial Wetland Park. It consists of freshwater and coastal saline marshes with small patches of mangrove forest.

156. The upgrading of protected areas within the scope of the project is unlikely to involve changes in land use rights, as the areas identified for upgrading are existing NRs. However, the project will include appropriate social and environmental assessment measures as necessary in order to identify and mitigate any potential impacts on local communities in relation to PA upgrading. This will take specific note of the rights and socio-economic needs of indigenous / minority groups living within and around these PAs. In

addition, they stand to gain potential benefits through identification of their roles in PA management and governance to ensure equitable benefit sharing, capacity building related to sustainable livelihood practices, support for cultural practices that support environmental protection and restoration, and job opportunities related to PA management (participatory patrolling, re-planting, etc) and nature-based tourism.

Output 2.6 Community co-management programmes established at demonstration sites

157. The project will demonstrate the introduction of co-management and alternative livelihood schemes targeting villagers associated with Dongzhaigang NNR and Qinglangang PNR. Co-management schemes will facilitate and empower local villagers to participate in the protection, restoration and monitoring of degraded wetland areas, aiming to reduce pressures on wetland resources due to over-harvesting or over-disturbance through appropriate measures such as the introduction of alternative livelihood ventures related to eco-tourism opportunities (homestays, deep sea fishing trips etc.) offered by the great increase of tourism to the island.

158. At **Dongzhaigang**, community co-management activities will focus on two areas, one in each of the two blocks of the reserve. The first will be in the northern block, involving the integration of the nature reserve's management interests (strengthened model buffer zone, alternative livelihoods for poor local communities, controlling the impacts of tourism development and aquaculture operations) into tourism development plans under the state-owned Haikou Culture and Tourism Company[41]. These plans include the development of a wetland recreation centre in the North part of the reserve called "Ta Se", located 200m from the reserve boundary, with mangrove replanting on saltpans to provide a model buffer zone between the centre and the reserve. It reportedly includes a museum, hotel and conference centre. The development offers potential for the wetland park, most of which will be used for restoration of grassland,beach and watercourse where birds could be located, and the rest of which will be used for mangrove restoration. The project's aims would be in developing a secure model buffer zone, guiding ecologically-sound planning for the wetland park, controlling potential tourism impacts through appropriate planning, and in providing technical guidance for mangrove restoration in the area in / around the wetland park. The project can also facilitate benefits to local people from this development by helping to integrate them into planning for the area – e.g., by building their capacity for tourist service provision (homestay, guiding, food, transport, etc).

159. In the southern block, the project will focus on land under the management of Sanjiang Farm company, and area of some 4,000 ha, including 600 ha of mudflats along 28km of shoreline. The farm has positive relationship with the reserve, including sporting events and conducting dyke repairs (minimizing impacts on mangroves). Consultations during PPG at Shanyuan Village indicated a tradition of mangrove conservation going back to the Chang Dynasty, and village mangrove regulations dating back to 1890. A high level of awareness of the importance of mangrove forest conservation exists at this village across all age groups. They have a high dependence on the forest and the protection it provides, emphasized by a serious typhoon in November 2011. There is no cutting of the forest now. Following poor aquaculture production due to poor water quality and disease, there is interest in restoring aquaculture ponds back to mangroves through the project, coupled with income-generation through eco-compensation[42] and/or alternative livelihoods. Women used to play an important role in collecting fish and shrimps, now do housework and look after crops. The men do the prawn culture and outside work.

[41] Source: Stakeholder meeting with Haikou City representatives, 15 June 2012.

[42] According to the China Council for International Cooperation on Environment and Development (2006) eco-compensation is a system of incentives and disincentives by both users and producers of ecological services. Incentives refer to a reward or compensation for a right that is foregone to maintain a certain ecosystem service. Disincentives refer to charges for the loss of or damage to ecosystems and natural resources.

160. A second village, Yanzhou, was the subject of a RARE social campaign project aiming to resolve problems of electro-fishing, which has been reduced, in return for financing of gravel road access by the reserve. The villagers are receptive to the idea of mangrove replanting in exchange for similar development assistance to meet local needs, such as a bridge or drinking water supply.

161. Strategically, the project aims to work directly with the Sanjiang Farm company, with a focus on those villages within its area that are most closely related to the mangrove resources (and specific problems like electro-fishing), for greater impact than working at only one specific village. Positive publicity / recognition for the farm would be an important outcome for their investment. Local development needs (wastewater treatment, water supply, roads, etc) will be identified as a potential trade-off for selected villages (supported by the NNR, farm, local government or eco-compensation funds) in return for conservation concessions such as mangrove replanting. Women will be proactively involved in community co-management activities, environmental awareness raising programmes, mangrove replanting and post-planting husbandry, as well as for development of home-based alternative livelihoods that allow them to continue family responsibilities such as seafood processing and handicraft production.

162. Dongzhaigang currently has two consultation mechanisms for working with local stakeholders. One is the Joint Conservation and Management Committee that includes representatives from local government and local villages. The second is an operational mechanism involving a local community liaison staff member recruited from one of the local villages.

163. At **Qinglangang,** historically, villagers were bound by regulations to protect the mangroves, their awareness of the value of mangroves is high and they care for the trees around their villages. However, there are still some illegal activities so the reserve is conducting awareness programmes to reduce their impact. Wenchang County government has invested considerable effort in systematically developing its tourism plans and infrastructure for this area, specifically under the Bamen Bay Greenways tourism project, which aims to attract visitors from Haikou through promotion on local television. The county Tourism Bureau, Planning Bureau and Forestry Bureau are collaborating on the Greenways project, and the Hainan mangrove regulations are being taken into account, although this needs carefully monitoring and control. Wenchang County govt will develop a "***Bamen Bay Wetland Park***" beside the PNR. There are some mangroves at this location, and effectively it will form a buffer area for the reserve. The main local occupations are fishing and aquaculture ponds (shrimps and fish), with relatively little differentiation of male and female economic roles. Fisheries have declined due to overfishing of fish and crabs, and pollution from the ponds, although income remains reasonable because of increasing prices. Over-exploitation of fishery resources remains a key issue for the reserve, therefore shifting local employment towards tourism, coupled with stronger controls on fishing methods and effort in cooperation with the Marine and Fisheries Bureau, will assist in reducing this pressure.

164. For the core area in Bamen Bay, the project's intervention will focus on assisting tourism development to achieve eco-tourism principles – avoiding mangrove habitat destruction and disturbance, contributing benefits to local communities (through services provided in guiding, accommodation, meals, transport, etc), ensuring that waste and water demand are properly managed, and potentially offering a source of revenue or cost-savings for the reserve. This could serve as a model for tourism development for other mangrove reserves. Tourism development provides strong scope for providing benefits to women as activities such as provision of local accommodation, food and information services, and the production and sale of handicrafts are compatible with their family roles. Therefore training and capacity building activities should proactively involve women as a target audience.

Output 2.7 Increased awareness of the values of mangrove PAs supports conservation

165. Awareness of the importance of the mangrove PAs in safeguarding biodiversity, ecosystem services and livelihoods will be increased through targeted campaigns and a communications programme, with the goals of supporting site conservation through stakeholder involvement, the development of co-management schemes and the introduction of sustainable financing mechanisms, making full use of economic arguments for conservation. See **Annex 6** for a summary of the baseline Knowledge Attitudes and Practices (KAP) assessment methodology and results.

166. The baseline awareness surveys conducted during project preparation will be supplemented by more targeted surveys at the demonstration sites as necessary for the selected co-management areas (including disaggregated information on gender and any minority ethnic groups present), and also in relation to other stakeholders associated with specific threats (such as fishing issues, which will be addressed through voluntary application of a Code of Conduct for Responsible Fisheries under **Output 3.2**), and the results used to develop site level communication plans. Communications activities will generally focus on resolving specific threats through messages targeted at key audiences (including women), building support for conservation through collaborative activities, enhancing awareness of nature reserve and mangrove regulations, and the values of mangrove ecosystem services.

167. At the provincial level, the written products arising from the economic valuation work (see **Output 3.3**) will be designed with the clear objective of mainstreaming wetland PAs (and the PA system as a whole) in the 13th Five-year Plan for Hainan Province. Accordingly, a social marketing campaign will be conducted, providing communication products based on these studies for key audiences associated with wetland protected areas (primarily policy-makers and planners from the provincial and local government agencies whose practices affect PAs, commercial operators in tourism and aquaculture development, as well as the media. This will aim to establish a clear linkage between wetland biodiversity / ecosystem services and the associated socio-economic values, including disaster risk reduction, coastal protection, flood mitigation, fisheries support, health, and contributions to local economies. Deliverables will include a range of products tailored for different audiences, including publications such as a handbook for decision makers, media coverage, blogs, campaigns, and outdoor events including guided tours to the demonstration sites for these key audiences (including journalists).

Outcome 3: Improved integration of wetland conservation into development and sectoral planning and practices through a strengthened PA System Management Framework including economic valuation of wetland ecosystem services.

(Total cost: 5,057,000 US$; GEF 400,000 US$; Co-financing 4,657,000 US$)

168. In response to Barrier 3 (the disconnect between wetland PA sub-system management and development planning and sectoral planning), this component will strengthen the PA system management framework of the province, addressing inter-sectoral coordination, integration of wetland PAs, their objectives and functions into provincial development plans and government eco-compensation schemes.

169. The project will strengthen cross-sectoral coordination with provincial agencies that are involved in spatial planning and environmental management, as well as specific sectors whose activities are impacting wetland PAs. This will be accomplished through the establishment / identification of an appropriate cross-sectoral body to provide permanent, proactive and strategic direction for the PA system, embedding of wetland PA objectives into major cross-sectoral plans, in particular tourism plans, and related capacity building.

170. In order to operationalise the mainstreaming, sector specific standards and safeguards will be developed to protect wetland PAs from biodiversity threatening sector practices. This will include setting up of standards for tourism development and operation and issuance of official guidelines for fisheries and aquaculture.

171. In support of mainstreaming and achieving sustainable financing for the PA system, the project will support compilation of a synthesis on the economic values of wetland PA sub-system following the internationally recognized methodologies and making use of existing studies as much as possible. The economic work will recognize the roles of wetlands in climate change adaptation and disaster mitigation, and implications of wetland loss and degradation due to specific sectoral practices will be clarified in the economic and financial terms. The product will be designed with the aim of mainstreaming wetland PAs (and the PA system as a whole) in the 13th Five-year Plan, through communication products developed under **Output 2.7** above.

172. The project will further support establishment of a wetland PA data sharing platform for stakeholders including planners, managers, researchers, NGOs and international agencies. Relevant data must be made easily accessible to planners and decision-makers so that wetland ecosystem services can be accounted for, utilized and not degraded. An online database containing information on wetland PAs will be developed and linked to a planned national platform under the CBPF-MSL national level project, with updating supported by routine monitoring and reporting procedures from the demonstration sites. Through the coordination between different projects under the CBPF-MSL Programme, lessons learned from this project will be widely disseminated to other Chinese wetlands, and equally lessons learned elsewhere can be shared in Hainan.

173. The main conservation outcome of this component will be a reduction in threat levels impacting wetland PAs arising from unsustainable, incompatible or environmentally damaging practices carried out by related sectors such as aquaculture, agriculture, fisheries, tourism and coastal development as a result of improved integration of wetland conservation into planning processes. Improved access to wetland PA information, and increased awareness of the value of wetland PAs as a result of economic valuation will support more informed planning and decision making. The outputs necessary to achieve this outcome are described below.

Output 3.1 Capacity developed to strengthen inter-sectoral coordination and mainstreaming of PA system objectives into provincial development and sectoral planning processes

174. This output will focus on building institutional capacity for inter-sectoral coordination in order to mainstream protected area management objectives into provincial and sectoral policies and plans (such as fisheries and aquaculture, agriculture, land use, tourism, infrastructure development planning, water resources management, etc, with local governments).

175. As noted in **Output 1.1**, a national PA strategy and action plan has been completed (2012-2020) by MEP, which requested each province to complete their provincial Strategy and Action Plan for the PA system, which HLERD is leading on with input from HFD and HMFD, a process which has been initiated and has involved inter-agency coordination. Accordingly, the project will strengthen coordination between the provincial agencies responsible for the PA system with those whose activities are influencing the condition of wetland PAs, in particular those mentioned in the Hainan Mangrove Protection Regulation[43] and also including the development reform commission, and water resources department.

[43] The *Mangrove Protection Regulation in Hainan Pro*vince (approved 22 July 2011) provides a clear basis for a collaborative approach towards the protection of mangrove resources, noting that while the forestry bureaus shall be responsible for the protection and management of mangrove resources; and mangrove nature reserves are managed by the bureaus stipulated in the Nature Reserve Regulations, "in accordance with respective functions and duties, departments of finance, land and resources,

Provincial government agencies currently coordinate on development planning through issue-based committees established by the Provincial Governor's Office. These may be ongoing committees, such as on urban development planning, or temporary committees set up to review specific plans such as tourism development plans. However, these committees appear to be mainly responsive (mitigating environmental damage) rather than environmentally proactive, therefore there remains a role for strengthening the profile of the PA System as an integral component of Hainan's future development, as well as building capacity both for EIA and SEA within the provincial government (see **Output 3.2**).

176. A provincial level cross-sectoral body such as a "leading group" will be established or identified to achieve this mainstreaming for the PA System. Through the coordination body, the project will support input to the mid-term review of relevant aspects of the 12th Five Year Plan and the embedding of coastal wetlands concerns into the 13th Five Year Plan for the province and subsidiary plans for key sectors (e.g. forestry, environment, water resources) as well as major cross-sectoral plans such as climate change mitigation and adaptation, achieving water security, and in particular the Hainan International Tourism Island Master Plan. These considerations should be founded on the strategic plan for the wetland PA subsystem and guidelines for coastal wetland management in Outputs 1.1 and 1,2 respectively. They should take full account of the socio-economic values of these wetlands as informed by Output 3.3, especially major ecosystem services such as coastal protection, fisheries production support, and water supply and purification.

The capacity of HFD, HLERD and HMFD for inter-agency coordination for the PA system will be strengthened through team-building, exposure to international models of intersectoral collaboration, and domestic training including communication and negotiation skills, conflict management, etc. based on capacity assessment results and professional competency standards in **Output 1.3**.

Output 3.2 Sector specific standards and safeguards developed to protect wetland PAs

177. In coordination with the CBPF MSL national project, sector specific standards and safeguards will be developed to protect wetland PAs from biodiversity threatening sectoral practices, including setting up of regulatory standards for tourism development; as well as the development and issuance of official guidelines for fisheries and aquaculture practices.

178. In the case of tourism standards, these should specifically relate to demonstrating best practice for eco-tourism and potentially other forms of niche tourism (cultural, historical), as well as the protection of nature-based tourism resources and reducing the environmental impacts of tourism development in line with the Tourism 12th Five Year Plan. While there is an abundance of international guidelines on ecotourism practices, the ASEAN Tourism Standards[44] provide a sound basis with similar geo-cultural context to Hainan. These include an ecotourism standard, as well as Green Hotel (environmentally friendly with energy conservation); homestay (an alternative form of family furnished accommodation generally located in a house); and Tourism Heritage (an outstanding cultural or natural heritage area that is protected, conserved and managed in a sustainable manner). The guidelines should be developed through a consultative process involving provincial and local tourism agencies and companies, as well as

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environmental protection, oceans, fishing, agriculture, tourism and public security should join efforts for the protection and management of the mangrove resource". Further, **Article 7** states that "the competent forestry authorities of provincial government shall collaborate with relevant departments to draw a development planning for mangrove protection, and perform it after submitting to the provincial government for approval"; and "The development planning of mangroves protection shall be coordinated with marine functional divisions, the general land use planning, urban and rural planning, tourism, and environment protection planning".

[44] ASEAN Tourism Standards. ASEAN Secretariat, Jakarta. http://www.aseansec.org/23074.pdf

concerned NRs, in order to ensure they are locally relevant, and to build awareness and buy-in. In order to provide incentives, compliance with the standards should be coupled to provincial government recognition (perhaps a "green star" rating or certification), publicity on official ecotourism websites, and award schemes for responsible tourism, such as that led by WildAsia[45].

179. Similarly, the development of official guidelines for coastal fisheries and aquaculture practices in mangrove areas can be informed by a wide range of international experience, guidelines[46] and standards[47], with due regard for provincial and national regulations. Since the launch of the FAO Code of Conduct for Responsible Fisheries in 1995[48], FAO has developed an array of technical guidelines[49] to provide advice and guidance for sustainable development of aquaculture. Countries have found these guidelines effective and useful, and many have incorporated them into national legal frameworks. Operationalisation of the standards and measures will be supported through promotion of the guidelines and standards, and capacity building for related local and provincial government agencies. The certification of sustainable aquacultural practices could be a long term aim for local players with adequate capacity[50].

180. In the case of mangrove-associated aquaculture, the guidelines should seek to address further encroachment of mangrove forest for aquaculture ponds, control of use of potential AIS, how to deal with wastewater pollution from aquaculture ponds in line with STAP guidance on nutrient reduction for industry and the private sector[51] (such as an Integrated Mangrove-Aquaculture System for *in situ* wastewater treatment[52]), and incentives for restoring unproductive ponds back to mangrove forest as key issues. For capture fisheries, the emphasis should be on ensuring sustainable yields through restrictions on certain types of fishing gear, fishing net mesh sizes, and encouraging a community-based approach to fishery management including monitoring catches and trends in economic species, and voluntary response measures.

181. In line with NBSAP Program 2, the application of national and provincial SEA and EIA procedures to Hainan's PA system will be reviewed to identify any specific weaknesses, especially in relation to wetland ecosystems, and capacity building training in these subjects will be provided to the

[45] http://www.wildasia.org/main.cfm/RTI

[46] For example, Barg, U.C. 1992. Guidelines for the Promotion of Environmental Management of Coastal Aquaculture Development. FAO Fisheries Technical Paper 328. FAO. Food and Agriculture Organization of the United Nations. Rome, 1992 (Reprinted 1993, 1995). http://www.fao.org/docrep/T0697E/T0697E00.htm;

[47] http://www.gaalliance.org/bap/standards.php

[48] See: http://www.fao.org/docrep/013/i1900e/i1900e.pdf and http://www.fao.org/docrep/005/v9878e/v9878e00.HTM (includes Chinese language version)

[49] See: http://www.fao.org/tc/resource-mobilization/ifas/ccrf/en/

[50] For example, see http://www.gaalliance.org/

[51] STAP. (2011). Hypoxia and Nutrient Reduction in the Coastal Zone. Advice for Prevention, Remediation and Research. A STAP Advisory Document. Global Environment Facility, Washington, DC. See p85 - Guidance for Stakeholders, Industry & the Private Sector.

[52] Peng YS, Li XL, Chen GZ YS, Li Effect of an integrated mangrove-aquaculture system on aquacultural health. Frontiers in Biology China 4:579-584.

She ZG, Lin JX, Peng YG, Chen GZ (2005). A preliminary study on mangrove and aquaculture system. Chinese Journal of Ecology 7: 837-840.

agencies involved in the PA system as well as those with direct impacts including Water Resources, Tourism, Aquaculture and Fisheries and Agriculture (noting that EIA is required for developments influencing mangrove resources)[53]. The joint guidelines produced by the Ramsar Convention and CBD for incorporating biodiversity considerations into EIA procedures provides a useful basis for such training, which also needs to take account of relevant national legislation.[54]

Output 3.3 Awareness raised of the economic value of mangrove wetland ecosystem services

182. In support of mainstreaming and achieving sustainable financing for the PA system, the project will support compilation of a synthesis on the economic values of the mangrove wetland PA sub-system following internationally recognized methodologies[55] and making use of existing studies. One such methodology is the '*Assessment Tool for Wetlands Ecosystems Functions, Benefits (Value Assessment),*' developed by the Chinese Academy of Sciences, which sets out criteria and indicators to evaluate wetlands, as a basis for eco-compensation arrangements. This is currently being tested at various wetland sites, and has potential for demonstration and further testing as part of this project.

183. A significant initiative that has provided case study results and methodological guidelines with particular relevance to coastal and marine ecosystem services (and hence highly relevant to Hainan's mangrove nature reserves) is the UNEP/GEF South China Sea Project's Regional Task Force on Economic Valuation[56, 57]. The programme is operating in seven riparian states bordering the South China Sea (Cambodia, China, Indonesia, Malaysia, Philippines, Thailand, and Vietnam). The study presents Total Economic Values per hectare of mangrove (also coral reefs, seagrass beds and "wetlands") based on a fairly comprehensive set of ecosystem services, and as such provides benchmark values, and potential value transfer values to be used by the MSL Hainan project. The South China Sea project included economic valuation of a mangrove demonstration site at Fangchenggang in Guangxi, China, which estimated the windbreak function of Fangchenggang mangroves at 40% of coastal defence costs – US$1,200/ha and carbon sequestration at US$326/ha.

184. The EHI undertaken for Dongzhaigang Mangrove Nature Reserve, at the MSL project development stage, identifies a number of pressures including marine water pollution from aquaculture farms, state farms and domestic sewage, overuse of groundwater supplies, overharvesting of species of economic value, and physical disturbances such as extensive erection of nets and taps, former construction of dams and tourism activities. The EHI suggests the development of ecotourism to reduce local communities reliance and high pressure on resources in the reserve and the promotion of sustainable harvesting by conducting co-management to develop alternative livelihood (e.g. ecotourism) prohibiting

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[53] **Article 15** of the *Mangrove Protection Regulation in Hainan Pro*vince states "As for national or provincial key engineering construction programs which need to occupy or collect mangrove forest lands shall submit environmental impact reports..."

[54] See: Ramsar Convention Secretariat, 2010. *Impact assessment: Guidelines on biodiversity-inclusive environmental impact assessment and strategic environmental assessment*. Ramsar handbooks for the wise use of wetlands, 4th edition, vol. 16. Ramsar Convention Secretariat, Gland, Switzerland.
Also: Resolution VIII.9: 'Guidelines for incorporating biodiversity-related issues into environmental impact assessment legislation and/or processes and in strategic environmental assessment' adopted by the Convention on Biological Diversity (CBD), and their relevance to the Ramsar Convention.
http://www.ramsar.org/cda/ramsar/display/main/main.jsp?zn=ramsar&cp=1-31-107%5E21514_4000_0__

[55] Following general guidance in: Bann C. 2012. Review of Wetland Ecosystem Service Valuation and Financing in China. Draft Report to UNDP/GEF China Biodiversity Partnerships Framework (CBFP)-Main Streams of Life (MSL) – Wetland Protected Area System Strengthening for Biodiversity Conservation Programme.

[56] Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand. Project No. GF/2730-02-4340, completed December 2008; http://www.unepscs.org/Regional_Task_Force_on_Economic_Valuation.html;

[57] UNEP. 2007. *Guidelines for Conducting Economic Valuation of Coastal Ecosystem Goods and Services.* UNEP/GEF/SCS Technical Publication No. 8.

using net with fine mesh size. To minimize the impacts of tourism a tourism plan is needed which confines tourism to the peripheral and/or experimental zone of the site; to reinforce supervision and management on tourism levels.

185. The current information on ecosystem services (see **Table 9**) is based on a rapid assessment by the project team and is qualitative at this stage. The EHI provides a qualitative assessment of some ecosystem services, and identifies threats and possible solutions, which can.

TABLE 9. KEY WETLAND ECOSYSTEM SERVICES & SECTORS ASSOCIATED WITH HAINAN'S MANGROVES

Key Wetland Ecosystem Services	Key sectors	Possible focus for valuation / sustainable finance
Provision of food (commercial & subsistence): marine fisheries, shellfish, other benthic invertebrates Spawning / nursery area for coastal fish, shrimps & other species Tourism potential Carbon sequestration Coastal protection (including: erosion resistance; storm defense; vertical accretion through sediment capture; and biomass accretion) Removal of nutrients and pollutants Nutrient cycling (basis of coastal / marine food chains)	Marine fisheries Aquaculture / Agriculture Tourism, Forestry Coastal protection & disaster reduction agencies Environmental protection, Oceanic affairs	Economic land use study comparing sustainable use of mangroves (including tourism where appropriate) with its conversion to shrimp farms, agricultural land etc (site specific), including distributional analysis, identification of opportunities for eco-compensation, new financing mechanisms, and alternative livelihoods. Focus on the value of mangrove protection function given increased risk of typhoons / flooding. Links with climate change adaptation agenda.

be used as context for the economic study. However, it should be noted that the EHI is not comprehensive in its coverage of ecosystem services and it was not designed with economic valuation as an objective.

186. A **mangrove land use study** is proposed, which will compare the sustainable use of mangroves (including tourism if appropriate) with the conversion of the mangroves to shrimp farms or agricultural land. The study will include a distributional analysis, the identification of opportunities for eco-compensation, new financing mechanisms and alternative livelihoods and the development of a business plan. In line with the PIF, **Dongzhaigang** is considered to be an appropriate demonstration site for the land use study. The site presents many opportunities (tourism linked to Haikou City tourism development planning), but also faces aquaculture production problems. The Reserve also has good capacity to undertake such a study.

187. The analysis will highlight the value of wetland ecosystem services, and conversely the economic losses incurred in relation to these services through wetland loss and degradation, under a range of practices. Mangrove land uses that may be considered by the study include – complete protection, sustainable tourism management, conversion to aquaculture or agriculture. The analysis will highlight the contribution that wetland ecosystems make to the productivity of key sectors. The distributional analysis will highlight impacts of different mangrove management options on different sectors of society (especially the vulnerable and poor) and facilitate the design of potential financing mechanisms.

188. The study will include the valuation of a number of key mangrove ecosystem services (e.g. coastal protection, fisheries production and nursery function, carbon sequestration and tourism potential) at the demonstration site. Comparative analysis of the values of wetland ecosystem services with the economic losses incurred in relation to these services through wetland loss and degradation due to the practices of various economic sectors will also be conducted. Detailed design of the studies will be undertaken at the implementation stage.

189. A key focus will be the value of the mangrove forest's **coastal protection function**[58], given the increased risk of typhoons and associated flooding from storm surges under climate change forecasts. This is consistent with both ecosystem-based and community-based adaptation responses to climate change. Therefore, a **provincial level economic assessment of the mangrove coastal protective function** is also proposed. This is supported by the significant level of interest in disaster risk reduction on behalf of the provincial government (including significant past investment in coastal green belt development, with potential for further expansion, focusing on nature reserve buffer zones to achieve biodiversity co-benefits). This significant policy benefit could leverage more money for wetland conservation. The economic valuation work could build on the research on mangrove protective belt in Guangdong. In Hainan nearly all available land has reportedly been replanted for coastal protection and it would therefore be difficult to extend the green belt further. However, a better understanding of the economic contribution of the mangrove as a result of coastal protection, will be instructive in ensuring on-going maintenance of the greenbelt, and possible strengthening of the NR buffer zones supported by provincial compensation (e.g. for impacted livelihoods / re-training), and adding more depth to narrow mangrove fringes (using native species). The strategy for undertaking the provincial scale assessment of the mangrove coastal functions will need to be developed at the project implementation phase and could involve extrapolation from representative pilot sites of the province.

Output 3.4. Online database for Hainan wetland PA and biodiversity information

190. A Hainan wetland PA data sharing platform will be established in order to make reliable information on the Mangrove PA Network sites and other wetland PAs accessible to a range of stakeholders including PA managers, researchers, NGOs and international agencies. The availability of rel*evant dat*a to *planners* and related sectors should assist informed decision-making to enable the benefits of wetland ecosystem services to be fully harnessed and accounted for, reducing the loss and degradation of natural capital. A database containing wetland PA and biodiversity information will be developed and adapted for web access and linked to the national platform under the CBPF MSL

[58] For example, see: McIvor, A.L., Möller, I., Spencer, T. and Spalding. M. (2012) Reduction of wind and swell waves by mangroves. Natural Coastal Protection Series: Report 1. Cambridge Coastal Research Unit Working Paper 40. Published by The Nature Conservancy and Wetlands International. 27 pages. ISSN 2050-7941. URL: http://www.naturalcoastalprotection.org/documents/reduction-of-wind-and-swell-waves-by-mangroves
And: Technical Guidelines for the Establishment of a Coastal Greenbelt. March 2007. The World Conservation Union (IUCN). Sri Lanka Country Office

Programme[59]. Indicative contents include: maps showing PA locations, boundaries, management zones, main habitats and facilities; protection status, international designations, status and trends of important species and habitats, key threats, , socioeconomic information, ecosystem health index monitoring results, ecosystem service valuations, local involvements, scientific information resources, etc. For effective data sharing the platform needs to be easily maintained, and regularly reviewed and updated.

191. The project will support establishment of routine monitoring and reporting procedures from the demonstration sites to the provincial level PA database. A subset of this information will then feed up to the national database planned under the CBPF-MSL national level project depending on the requirements of the latter. Through the coordination between different projects under the CBPF-MSL Programme, lessons learned from this project will be widely disseminated to other Chinese wetlands, and equally lessons learned elsewhere can be shared in Hainan.

192. The necessary hardware and software will be put into place, and training, network, data flows, data sharing protocols and data reporting forms necessary to operationalise the database will be developed. Collaboration of several existing institutions (HFD, HLERD and HMFD) is envisaged and would constitute government contribution to the project. The database should be accessible online so that duly cleared information can be accessed by any user, linking existing sub-databases. The database should accommodate the flow of new data from the field based monitoring (e.g. EHI, surveys and target research studies) to be implemented under the project and include a legal incidents database to support law enforcement monitoring. A monitoring guidelines booklet will be developed, including sections for data management at different levels – community, NR, provincial, etc. – and data sharing and reporting protocols.

193. This activity will be undertaken as a service contract, awarded to a qualified organization with appropriate ICT capacity. Training will be provided for database developers and managers within the provincial government.

PROJECT INDICATORS

194. The project indicators contained in **Section II / Part II** (Strategic Results Framework) include only impact (or 'objective') indicators and outcome (or 'performance') indicators. They are all 'SMART'[60].

195. The project may however need to develop a certain number of process-oriented indicators to compose the 'M&E framework' at the site level. For this reason, the establishment of a 'site-level M&E framework' is envisaged for the demonstration sites in Component 2. This site-level framework feeds into the project's overall M&E framework, in that it includes site level METT and EHI assessments, which incorporate comments of value in providing direction to site management and monitoring. It is envisaged that the project's overall M&E framework (see **Part IV** below) will build on UNDP's existing M&E Framework for biodiversity programming.

[59] The national database would be available for open access and form a component of the National Biodiversity Information System (NBIS) which is currently being developed under coordination of MEP (holder of CBD Clearing House Mechanism). There will also be a knowledge management and sharing component in the database, storing and availing information and technical knowhow on successful wetland management cases around the country which were achieved through government and donor-funded initiatives.

[60] Specific, Measurable, Achievable, Relevant and Time-bound.

196. The organisation of the logframe is based on the general assumption that: *if* (Outcome 1) there is improved protection and management of Hainan's ecosystems through expansion, consolidation and strengthening of the provincial PA system; and *if* (Outcome 2) strengthened protection, participatory management and restoration of mangrove forests are achieved through the development of a Mangrove PA Network; *and if* (Outcome 3) improved integration of wetland conservation into development and sectoral planning and practices occurs through a strengthened PA System Management Framework including economic valuation of wetland ecosystem services and sustainable financing; *then* (Project Objective) the management effectiveness of the wetland protected area system in Hainan will be strengthened in response to existing and emerging threats to the globally significant biodiversity and essential ecosystem services. This logic is based on the barrier and root-cause analysis carried out during the PPG phase (refer to **Section I, Part I**, chapter on Long term solution and barriers to achieving the solution).

197. In turn, the choice of indicators was based on two key criteria: (i) their pertinence to the above assumption; and (ii) the feasibility of obtaining / producing and updating the data necessary to monitor and evaluate the project through those indicators See **Annex 5** for the project indicators elaboration and results measurement table.

RISKS AND ASSUMPTIONS

198. The project strategy, described in detail within this project document, makes the following key assumptions in proposing the GEF intervention:

- Baseline conditions in the selected areas can be extrapolated with high confidence level to other coastal mangrove wetland areas and lessons learnt can be successfully disseminated.

- Increased awareness and capacity will lead to a change in behaviour with respect towards the conservation and sustainable use of coastal mangrove wetland resources.

- The sustainable financing and effective management of coastal mangrove wetland nature reserves will gradually become a higher national priority for SFA and related agencies such as MEP, SOA and NRDC as knowledge and information is made available.

199. During the PPG phase, projects risks were updated from what has been presented at the PIF stage. They were further elaborated and classified according to UNDP/GEF Risk Standard Categories[61], and assessed according to criteria of 'impact' and 'likelihood' (Box **Error! Reference source not found.**). These risks and the mitigation measures (see **Table 10**) will be continuously monitored and updated throughout the project, and will be logged in ATLAS and reported in the PIRs.

[61] Includes the following eight categories: environmental; financial; operational; organizational; political; regulatory; strategic; and other.

Box Error! Reference source not found.. Risk Assessment Guiding Matrix						
		Impact				
Likelihood		Critical	High	Medium	Low	Negligible
	Certain / Imminent	Critical	Critical	High	Medium	Low
	Very Likely	Critical	High	High	Medium	Low
	Likely	High	High	Medium	Low	Negligible
	Moderately Likely	Medium	Medium	Low	Low	Negligible
	Unlikely	Low	Low	Negligible	Negligible	Considered to pose no determinable risk

TABLE 10. PROJECT RISKS ASSESSMENT AND MITIGATION MEASURES

Identified Risks	Category	Impact	Likelihood	Risk Assessment	Elaboration of Risks	Mitigation Measures
Lack of incentives and poor enforcement of planning priorities will hinder mainstreaming wetland PAs into sectors	Financial / enforcement	Medium	Likely	Medium	Mainstreaming wetland PAs into sectoral policies will be hindered by lack of incentives for other sectors and poor enforcement of agreed priorities and plans that may be incompatible with larger tourism development, land conversion or other development programmes.	The project will support an enabling institutional framework for mainstreaming, development of tools for mainstreaming such as the consolidated information data base on wetland PAs, wetland PA system review, and economic valuation studies. Sector specific standards and safeguards development will offer a practical measure for improving sector practices. The project will also support operationalisation of the newly approved Regulation on Mangrove Protection through targeted support in increasing management effectiveness of the mangrove NRs. Efforts will be made to develop viable partnership between different (and sometime competing) agencies.
Ecological responses to climate change impacts may undermine conservation efforts	Environmental	Medium	Moderately likely	Low	Severity of climate change impacts (including sea level rise, increased frequency of typhoons, and increased incidence and extended duration of extreme weather (e.g., floods and drought) may undermine conservation efforts promoted by the project through changes in mangrove distribution and changes in	Given that climate change impacts are likely to increase over the long term, the project will assess these changes and propose actions and approaches to increase ecosystem resilience. These will include flexibility of wetland PA zones and boundaries, maintaining a full range of wetland types and improving habitat connectivity. Migration patterns and timings of wintering shorebirds may change, requiring flexibility in the management of PAs designed to accommodate migratory species.

					community resource use intensities	
Tourism development strategy will increase threats on mangroves	Strategic	Medium	Likely	Medium	Mass tourism stimulated by the International Tourism Island Development strategy will exert more threats to the mangrove forest in Hainan Province, due to increased disturbance, increased consumption of seafood, and encroachment of forested land for tourism facilities.	The project aims to integrate the PA system with provincial tourism development plans and activities. The project activities are expected to reduce the new pressure of mass tourism and keep the natural mangrove forest intact by establishing viable model buffer zones such as a wetland park on reclaimed land through mangrove plantation and by promoting eco-tourism in experimental zones by boardwalks, bird watching hides, and nursery gardens.
Local communities still follow incompatible practices jeopardizing biodiversity	Political	Medium	Likely	Medium	Unsustainable and ecologically damaging practices in and around mangrove reserves including duck-farming, over-exploitation of fisheries, use of electro-fishing methods, collection of medicinal plants, pollution from aquaculture ponds, etc.	The project will take an integrated approach towards improving community attitudes and practices towards PAs, including awareness raising, co-management and community participation approaches, support for development of alternative livelihoods, and improved PA capacity for participatory management, monitoring and law enforcement.
Local government lacks interest to establish/upgrade PAs	Political	Medium	Likely	Medium	Due to lack of understanding of the benefits of PAs, lack of scope for participatory management, and interest in	The project aims to raise awareness of the economic values of wetland ecosystem services, to develop eco-compensation arrangements to help provide sustainable financing for PAs and related local communities, and to engage local authorities through participatory processes for

					maintaining economic land uses, local government generally prefers to keep land administration under its control with resulting ecological damage. In addition, it is difficult for local governments to adequately finance the management of PAs.	development of the PA system and for management of individual PAs.
Superintendence in PAs is ineffective leading to biodiversity decline	Operational	Medium	Moderately Likely	Low	PA staff in many cases lack professional capacity for dynamic leadership, as there are few incentives for them to demonstrate commitment in achieving reserve management objectives.	The project will support the development of professional standards for PA jobs, provide training to raise current standards, and work with PA system planners to develop sustainable financing for the PA system. In addition, the development of the Mangrove PA Network will provide opportunities for learning and sharing experiences and approaches between reserves.
Changes in legal protection status of PAs and habitat restoration may impact land use rights of local communities	Operational	Medium	Moderately Likely	Low	The creation of new PAs and upgrading of existing PAs as well as mangrove restoration in developed landscapes such as aquaculture ponds may require the acquisition of land use rights to ensure secure public use status if lands are not already in public domain.	All plans for PA creation and upgrading and habitat restoration supported by the project will include an assessment of land tenure and land use rights, with particular regard for indigenous and other vulnerable groups. In the event that social impacts are likely to occur, the project will negotiate possible terms of settlement with due respect for the rights of the individuals or communities involved.

INCREMENTAL REASONING AND EXPECTED GLOBAL, NATIONAL AND LOCAL BENEFITS

200. The project seeks to improve PA management effectiveness from the low end towards the effectively managed end of the spectrum in order to significantly reduce threats to biodiversity. **The incremental approach of the proposed project is summarised as follows:** The Government of China and the Hainan Provincial government have clearly identified wetland conservation as a priority and are making significant investments and efforts for conservation and wetland PA management. However, many investments tend to be for physical work such as infrastructure development and hardware installation such as information centres and IT based area monitoring systems at the site level, with very little focus on wetland biodiversity conservation and species management. In parallel, the governments invest in tourism infrastructure development and promotion, to make Hainan an international tourism destination, with little consideration for biodiversity conservation. There has also been no systematic effort to remove the existing barriers to a sustainable and effective PA system to ensure that, at a minimum, wetland biodiversity within PAs can be safeguarded. In many existing PAs, pressure for the use of land and coastal natural resources, as well as threats coming from distant areas through water courses, requires urgent action in order to prevent further degradation of critical coastal wetland ecosystems and loss of critically endangered species.

201. **Without the GEF investment in the proposed project**, the management of wetland PAs will continue to be unsystematic and inadequacies in provincial regulations governing PAs and wetlands are unlikely to be addressed. The provincial Forestry Department's PA management will lack uniform management standards and staff competency standards. While investment in the PA system will be substantial, investment will continue to be mainly focused on infrastructure rather than supporting operational needs. Research results are not mobilized into strategic planning due to lack of coordination with PA system managers. Similarly, there is a lack of cross-sectoral integration of plans and information on PAs is not centralized or easily accessible. Thus the provincial and local PA management authorities will continue to have limited capacity for effective management and lack the tools and capacity for mitigating threats coming from outside the PAs. Lack of integration of PA system plans into sectoral and development planning processes and the continuing development of coastal tourism, aquaculture, fisheries and infrastructure without ecological guidance and environmental standards will result in increasing pressures on PAs. Hence the management effectiveness of wetland PAs will remain weak and highly vulnerable to pressure from these economic sectors as well as livelihood activities from neighboring communities. While there has been significant investment in development of coastal protection belts, most of this consists of plantations of exotic species with little consideration of ecological needs or impacts on the local ecology. Restoration of mangroves and future expansion of the PA system beyond existing plans will become increasing difficult due to rapidly increasing land prices and greater land use pressures, therefore this project offers a timely opportunity to consolidate the PA system.

202. **Alternative scenario enabled by the GEF**: The project complements baseline programmes and projects by addressing biodiversity conservation through strengthening the provincial PA system as a whole rather than focusing on PA sites. The GEF investment will enable expansion of the PA system in the Hainan Province through a series of connected measures, including planning for the wetland PA subsystem and climate change adaptation; strengthening the systemic and institutional capacity of the provincial and local forestry departments for PA system planning and management through introducing professional competency standards and training for PA system positions; and increasing the availability of sustainable operational funding for biodiversity management within the PAs through financial planning that incorporates sustainable financing opportunities. At the wetland site level, the project will introduce a PA network management approach focusing on seven mangrove PAs, which will seek to improve the management effectiveness of individual PAs through a collaborative approach towards capacity building based on professional competency standards for PA site management positions. By demonstrating the

systematic improvement of the mangrove PAs at provincial level, the project will introduce an ecosystem based approach to PA management, with the aim of replicating this strategy in other types of PAs within the province and mangrove PAs in other provinces in the country. Furthermore, the project will demonstrate effective PA management through community co-management, management planning, strengthening buffer zones and replanting mangroves. Finally, while strengthening the ability of PA authorities to manage emerging threats in the PA system itself, the project also seeks to put in place safeguard standards and measures to ensure that land and resource uses in and outside PAs, particularly in areas directly affecting the integrity of mangrove wetland biodiversity within the PAs and their broader coastal landscape, are regulated. This is addressed through strengthening inter-sectoral cooperation between provincial agencies, developing regulatory standards and guidelines for two key sectors impacting mangrove resources, tourism and aquaculture/fisheries, and conducting an awareness programme that will convey the economic values of mangroves to key audiences based on an economic analysis. Information on the mangrove reserves will be systematically collected and made available through a centralized database to facilitate more informed planning and management.

203. The GEF investment will provide the following **Global Environmental Benefits:** GEF funding will secure critically important coastal wetland biodiversity in the 9,171 ha of mangrove NRs in Hainan Province, containing globally important mangrove communities and species, and habitats for migratory waterbirds including the globally threatened Black-faced Spoonbill (EN) and Spoon-billed Sandpiper (CR). The project will also support the upgrading of legal protection for Sanya Mangrove City NR (728 ha) and three other wetland and catchment forest PAs totalling more than 55,000 ha, support PA system strategic and financial planning, and expansion of terrestrial PA coverage by at least 40,000 ha, taking the integrated approach of looking at the whole island as coastal watershed, enhancing protection of the Hainan portion of the Indo-Burma global biodiversity hotspot, and its many endemic species such as Hainan Gibbon, Hainan Moonrat, Hainan Flying-squirrel and White-eared Partridge.

204. **Socioeconomic benefits:** The target PAs make an enormous contribution to the provincial economy, and ecological and social welfare of people in Hainan. Wetland PAs provide essential water resources to people and industries. In particular, the coastal wetland such as mangrove, is not only important nursery grounds for many fish, crustacean and other commercial viable species, but also provide useful natural resources and critical buffer against coastal erosion, storms and tidal swells. For example, it is estimated that the Dongzhaigang mangroves have the economic value of US$ 59 million per year through material production, water purification, air components control, soil keeping, tourism and biodiversity maintenance. In Vietnam, it was also estimated that planting mangrove along part of the coastline cost US$ 1.1 million, but saved US$ 7.3 million annually in dyke maintenance. By safeguarding vital hydrological and disaster abatement services of wetlands, the project will generate large positive social and economic externalities to the Province. Wetlands also support various livelihood and economic opportunities, such as fisheries, agriculture, and tourism. They also offer opportunities for public recreation and scientific studies. By improving the design of the PA system, strengthening the PA management, and putting in place measures to manage the adverse impacts of sector activities, the project will make an important contribution to realising sustainable tourism development and economic development in Hainan. The estimated 20,000 residents around the Dongzhaigang and Qinglangang NRs will directly benefit from the sustainable use management system as well as full participation in PA co-management and benefit sharing arrangements, and alternative livelihood programmes. Local communities in other PAs including the ethnic minority groups in the inland mountain areas and certain coastal areas will indirectly benefit from the strengthened PA system as a whole in Hainan. The project aims to produce a model co-management system for the mangrove PAs, which the provincial government will apply to other PA types in Hainan. For the PA expansion and consolidation component, the project will ensure that local residents will fully participate in the process of determining the new PA boundaries as well as the rights and responsibilities of the resident communities over resources within the PAs and in the model buffer zones. As women among the local communities are more often engaged with gathering

natural resources and collecting water, they are the primary beneficiaries of sustainable and quality supply of these resources. This is particularly evident in Hainan where rural women face a hard unpaid workload, including shellfish collection and operating fishing nets. In areas now dominated by aquaculture ponds, women used to play an important role in collecting fish and shrimps, but now do housework and look after crops. Women, children and old people are often left behind in the villages as the men increasingly take up outside work as a main source of income, shifting away from natural resource dependency. Therefore the project will engage with women as a key group involved in natural resource management as well as the care and education of children, through a combination of community co-management activities, capacity building for alternative livelihoods and environmental awareness raising.

COST-EFFECTIVENESS

205. The project's approach of addressing PA system level barriers (including inadequate provincial level management capacity, limited tools and capacities at site level, and a significant disconnect between the management of wetland PAs and development and sectoral planning) is cost-effective in that it will have broad applicability at provincial and national levels, including impacts beyond the selected demonstration sites.

206. As part of the national CBPF-MSL programme, the project contributes directly towards larger national policy, regulatory, fiscal, data management and communications goals in support of wetland biodiversity conservation and an effectively managed national wetland PA system through upscaling of its demonstration activities and approaches. The project implementation arrangements include a direct link between the project steering committee and the CBPF MSL national project to ensure that this will be realized.

207. At a technical level, the streamlining of approaches throughout Hainan's PA system for law enforcement, monitoring and information management will be a cost-effective investment in terms of project impact as well as for HFD's subsequent operations. The project's approaches in building support from across multiple sectors, stakeholders including local communities, and building capacity of the provincial forestry bureau are expected to lead to cost-effective PA management that avoids duplication of work, reduces biodiversity degradation and loss of ecosystem services from incompatible development practices, and ensures the sharing of timely information and resources. While the project will conduct pilot economic valuation of key wetland ecosystem services in Hainan, figures from a study at Fangchenggang (Guangxi) indicate that the ecosystem services provided by one hectare of mangroves equate to some USD 22,000 annually[62].

208. The total GEF investment of $2,634,771 for this project will leverage a minimum of $17.3 million in cofinancing from HFD, a highly cost-effective ratio of 6.57. The overall GEF investment in strengthening overall management effectiveness for Hainan's terrestrial PA system will average around US$ 2 per hectare per year, while the project's investment in the mangrove PA subsystem (component 2) averages USD 180 / ha in view of the small size of the remaining mangrove forest, still less than 1% of the estimated value of the ecosystem services provided.

209. Finally, the receipt of GEF resources channeled through a UN implementing agency is a source of pride for provincial government agencies in China, which often facilitates their ability to achieve the necessary political commitment to take difficult decisions on issues such as upgrading PA protection

[62] UNEP, 2007. Procedure for Determination of National and Regional Economic Values for Ecotone Goods and Services, and Total Economic Values of Coastal Habitats in the context of the UNEP/GEF Project Entitled: *"Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand".* South China Sea Knowledge Document No. 3. UNEP/GEF/SCS/Inf.3

status, inter-agency coordination to reduce external pressures on PAs, the adoption of more environmentally friendly practices in related sectors, and concessions on land uses; a particularly cost-efficient means to an end.

PROJECT CONSISTENCY WITH NATIONAL PRIORITIES/PLANS

210. The proposed Project is well aligned with national and provincial policies and programmes. The *12th National Five-year Plan (2011-2015)* urges environmental protection and sustainable growth, enhancing "ecological conservation and restoration." The plan urges the reinforcement of biodiversity conservation, strengthening monitoring in Nature Reserves (NR) – the main protected area category - and improving their management and protection. Project related objectives include:

- 2.2 Development of the marine economy, including … strengthen the protection of coastal wetlands, and marine environment;
- 3.1 Actively develop tourism industry, promote specialized tour and tourism products development, and promote eco-tourism nationwide;
- 4.4 Support the development of the Eastern Region, including …Hainan Eco-island Development;
- 5.2 Development of adaptation mechanism to respond to climate change, in particular to enhance the adaptation capacity of natural ecosystems, e.g., forests and wetlands;
- 5.5 Promote ecological conservation and restoration. (1) Development of eco-security shelterbelt: focus on the national key ecological function zones, in combination of the restricted development zones (protected areas);
- 10.1 Deepen natural resource price reform, such as water price, and environmental fees;
- 15.2 Strengthen coordination and management of sector planning.

211. The *12th Five-Year National Forestry Development Plans (2011-2015)* consists of 12 major tasks for the next five years, attaching great importance to wetland conservation and wise use, in particular focus on the management of Ramsar sites, wetlands of national importance, and wetland protected area systems. These include the following, see the baseline section for more detailed plans for Hainan:

1) Development of national land security, including:

- Protect and Develop Forest Ecosystems, through implementation of key forestry ecological programs (natural forest protection, reforestation, strengthen grain for green program… and (relevant to Hainan) the coastal shelterbelt program.
- Protect and restore wetland ecosystems, through implementation of national wetland conservation programs, restore national and international important wetlands through water supply projects, water pollution control, and rational utilization. Ramsar sites, national important wetlands, nature reserves, national wetland parks, coastal wetlands, high altitude wetlands, migratory waterbirds flyway network sites, as well as transboundary wetlands are the key focus.
- Maintain biodiversity, through implementation of wildlife conservation programs, nature reserve development programs, protect and improve habitat for endangered species. Development and consolidate national wide wildlife rescue, breeding and genetic conservation system, and improve capacity of nature reserve management, as well as capacity for international trade on wildlife.

3) Promote ecological civilization (culture) development:

- development of pilot demonstration base for the ecological civilization, and culture.
- promote urban-rural greening and gardening development
- encourage creative work to produce ecological culture and literature products.

212. In 2003, the Central Government, under the leadership of the Communist Party, adopted the "rational development" concept as the new national development strategy. It calls for sustainable, integrated, and harmonious development for China's future in order to transition towards a vision of ecological and sustainable future. Such paradigm shift has set wetland conservation and restoration on top of the national agenda. In the same year, the State Council adopted China's National Wetland Conservation Program (2004-2030), and in 2004, the State Council issued its first circular order on wetland management, which urges all provincial governments to develop policy and management measures for wetland conservation. In 2009, the Central Government called for pilot wetland eco-compensation schemes to secure the maintenance of the multi-functions of wetlands along with the harmony between nature and people. Under this framework, cross-sectoral plans and sector plans identified wetland biodiversity conservation and management as priorities.

213. China has adopted policies, strategies and plans for the conservation and sustainable use of wetlands including the National Wetland Conservation Plan (2002-2030) and Aquatic Wildlife Conservation Action Plan.

214. According to the National Wetland Conservation Program (2004-2030), by 2030, the number of wetland nature reserves will be increased to 713 and the number of Ramsar sites shall be increased to 80. More than 90% of natural wetlands shall be protected effectively. In total, 1,404,000 ha of wetlands will be restored. It is also planned that 53 national wetlands conservation and wise use demonstration pilots will be set up. All these actions will ensure a comprehensive legislation, monitoring and scientific-research for wetland PAs in China. During the 12th Five Year Plan period, four targets have been set, including:

(i) Establishment of a comprehensive wetland protected area system, which consists of nature reserves and wetland parks, covering 55% of the natural wetlands under legal protection;
(ii) Restoration of 100,000 ha reclaimed, or degraded wetlands, to enhance overall wetland resiliencies;
(iii) Promotion of sustainable use of wetlands; and,
(iv) Capacity building for national and provincial level wetland conservation and management, including wetland monitoring, evaluation, research, public awareness and outreach capacity.

215. This project will contribute significantly towards all four targets, enabling the provincial government to establish a comprehensive wetland protected area system for Hainan Province, restore more than 1,000 ha of mangrove forest and associated habitats, improve the sustainability of key land uses impacting coastal wetlands, and build capacity for effective wetland PA management at site and provincial levels.

216. The recently approved *National Biodiversity Conservation Strategy and Action Plan* (NBSAP 2011-2030) identifies 35 biodiversity priority protection regions in China which include the *Tropical Forests of Hainan* which is partially targeted by the project. The project will address key priorities under the NBSAP, through implementing its priority strategy of strengthening the effectiveness of the PA system in China and, among others, contributing directly to the achievement of programs 12 (biodiversity montoring development), 14 (wetland conservation and restoration pilot programs and monitoring network for key wetlands), 18 (coastal wetland and near shore protected area management and pilot demonstration), 19 (protected area management programs), 20 (mangrove forest conservation and restoration program) and 38 (biodiversity conservation communication, education and public awareness) respectively.

217. The project is also in line with the *China Biodiversity Partnership and Framework for Action* (CBPF), which is China's primary investment strategy for biodiversity conservation through the GEF and other partners. This project has been designed to address urgent, priority and catalytic issues identified under the CBPF, in particular under Theme 3: Investing and Managing Effectively in Reducing Biodiversity loss in PAs. It will contribute directly and substantially to Results 4, 16, 17, 18 and 19 of the agreed CBPF Framework which are respectively: financial flows to biodiversity conservation increase over current baseline; effective governance and legal framework for the national protected area system; harmonised and effective national system for selecting, designing, managing and monitoring protected areas; NRs and PNRs are effectively managed; National NRs and PNRs have stable and sufficient finance.

218. The project is part of the GEF/UNDP Programme *Main Streams of Life - Wetland PA System Strengthening for Biodiversity Conservation*, which is a sub-programme of the CBPF. The project is one of the six provincial level initiatives under the umbrella framework programme, and will contribute to the national level programme outcomes under the three programmatic components.

COUNTRY OWNERSHIP: COUNTRY ELIGIBILITY AND COUNTRY DRIVENNESS

219. China's commitment to biodiversity conservation and PA development is evident in its signature to the Convention on Biological Diversity (CBD) in 1992, and its active participation in other MEAs including the Ramsar Convention (also signed in 1992, with 41 Ramsar sites totaling 3,709,853 ha as of September 2012), CITES (1981) and UNFCCC (1992). China has remained steadfast in its commitments under CBD and in particular with activities under article 17 *(in situ* conservation). A very extensive national system of PAs has been established.

220. The project is consistent with national policy elements of the 12th National Five-year Plan, National Biodiversity Conservation Strategy and Action Plan 2011-2030 (NBCSAP v2, 2010), provincial development plans and many national programmes (see above section). These all add up to a clear commitment on behalf of the government to ensure adequate protection and restoration of the natural environment of the country to protect biodiversity, maintain vital ecosystem functions and help regulate climate. The project is aligned to assist the State Forestry Administration (SFA) to achieve its target of adequately protecting 55% of the natural wetlands in China by the end of 2015, mitigating further loss of natural wetland areas and degradation of their functions. As the national executing agency for this project, the Hainan Forestry Department has been involved in the development of the PIF and this project document and has committed substantial co-financing (USD 17.3 million) to enable implementation of the full sized project, while SFA is an executing partner of the overall CBPF MSL programme and its national project.

SUSTAINABILITY AND REPLICABILITY

221. The Environmental and Social Screening Procedure (ESSP) was followed during the PPG, as required by the ESSP Guidance Note of the UNDP. The results of the ESSP for this project are summarized as follows. Please see **Annex 7** for the full ESSP summary.

222. **Environmental Impacts:** The project explicitly aims to achieve overall positive environmental improvements with respect to environmental quality, ecosystem integrity and biodiversity conservation in order to achieve global environmental benefits. Owing to the ongoing local practice of using exotic tree species for coastal protection belts and mangrove reforestation (including inside PAs), the project will need to proactively ensure that such practices are avoided for project-related activities and that understanding of the potential ecological impacts of IAS is improved among agency staff.

223. **Social Impacts**: There is potential for social impacts in project activities that involve the creation of new PAs, increasing legal protection for existing PAs, and mangrove replanting (habitat restoration) on occupied lands. Hainan's indigenous peoples are mainly distributed in the mountains and will be largely unaffected. However some do occur near coastal wetland PAs, therefore project plans for these specific sites (Sanya Mangrove NR and Changjiang Haiwei Wetland Park) should take specific account of their situations and seek to provide appropriate benefits. In order to avoid or mitigate social impacts, the project document has indicated that planning for these situations needs to identify existing land tenure and land uses and potential social impacts, and to negotiate fair and equitable settlements where applicable, with due regard for individual and community rights. The project promulgates a participatory approach to conservation and will seek to build local capacity for community co-management and stakeholder involvement, including ethnic minorities. It includes resources to support the development of alternative livelihoods and improvements to the sustainability of existing land uses, with potential to offset negative social impacts. Potential benefits to ethnic minorities include identification of their roles in PA management and governance to ensure equitable benefit sharing, capacity building related to sustainable livelihood practices, support for cultural practices that support environmental protection and restoration, and job opportunities related to PA management (participatory patrolling, re-planting, etc) and nature-based tourism.

224. The project will address sustainability as follows:

- Financial sustainability will be achieved through the project's emphasis on improving funding security for PA operations, especially to support the financial needs of effective PA management including monitoring and enforcement programmes. The project includes demonstration activities testing eco-compensation mechanisms that have potential to provide sustainable financing for PAs, linked to national level policy development through the CBPF MSL national project.

- Institutional sustainability will be improved through capacity development measures for HFD and related agencies involved in managing Hainan's PA system. The project specifically focuses on building staff and institutional capacity for enhanced planning and management effectiveness in the provincial PA system. In addition, the project will strengthen coordination with broader provincial development planning and sectoral agencies, and seek to mainstream PA system objectives into key sectors including tourism, water resources, fisheries, aquaculture and coastal development.

- Social sustainability will be improved through efforts to support and empower local communities for greater involvement in PA management activities, especially through demonstration co-management arrangements, sustainable livelihood development and awareness raising to address existing local resource use conflicts and empower women. Long-term investments to raise staff and institutional capacities for stakeholder participation, and sustained improvements in relations with local communities (through regular communication, joint field operations and targeted awareness raising) will lead to increased levels of local participation and improved PA governance, contributing to the overall sustainability of project outcomes.

- Environmental sustainability will be achieved through improved PA system design in terms of size, habitat representation and connectivity, especially in relation to coverage of wetland habitats. Key considerations include increasing the resilience of the PA system in the face of climate change, anticipated future developments and environmental change,

reinforcing a catchment management approach to wetland systems, and strengthening model buffer zones for small coastal mangrove PAs.

225. The project's outcomes are replicable as the barriers it addresses are largely shared by other provinces, and the approaches used are transferable to strengthen the management effectiveness of PA systems across China. For instance, the benefits of establishing an ecosystem-based PA network (for mangroves in this case) will be documented and evaluated for potential uptake at national level. Upscaling of the Hainan mangrove PA network to include mainland mangrove PAs is a logical next step, depending on the receptivity of adjacent provincial forestry departments. As an integral part of the national CBPF-MSL programme, the project's outcomes will contribute directly towards larger national policy, regulatory, fiscal, data management and communications goals in support of wetland biodiversity conservation and an effectively managed national wetland PA system. This will include informing national policy development on issues such as mainstreaming PA system and biodiversity conservation objectives into related sectors, valuation of wetland ecosystem services, eco-compensation scheme mechanisms to support PA management costs, monitoring ecosystem health, and community-co-management approaches. The project implementation arrangements include a direct link between the project steering committee and the CBPF-MSL national project to ensure that this will be realized. Several activities for capturing best practices and local traditional knowledge will be used in the project to help promote replicability, including UNDP's Learning and Knowledge Sharing electronic platform.

PART III: Management Arrangements

226. The project's implementation and execution arrangements will focus on maintaining strong collaboration and cooperation, and avoid duplication of effort, among PA conservation initiatives in Hainan Province during the five year implementation period. The Hainan Forestry Department (HFD) is the government institution responsible for the daily execution and coordination of the project and will serve as the government *Executing Agency* (EA). UNDP is the *GEF Implementing Agency* (IA) for the project. The project is nationally executed (NEX), in line with the Standard Basic Assistance Agreement between the UNDP and the Government of China, and the Country Programme Action Plan (CPAP).

Project Oversight

227. Oversight of project activities will be the responsibility of the Project Steering Committee (PSC) (sometimes also referred to as the Project Board). Day-to-day operational oversight will be ensured by UNDP, through the UNDP Country Office in Beijing, and strategic oversight by the UNDP/GEF Regional Technical Advisor (RTA) responsible for the project. This oversight will include ensuring that the project practices due diligence with regard to UNDP's Environmental and Social Screening Procedure.

228. The HFD will take overall responsibility for the project execution, and the timely and verifiable attainment of project objectives and outcomes, but will report to the PSC. HFD will provide support to, and inputs for, the implementation of all project activities, and recruitment of project staff and contracting of consultants and service providers with the advice from and involvement of the UNDP. International procurement will be mainly handled by the UNDP upon request of the HFD. The HFD will nominate a high level official who will serve as the Provincial Project Director (PPD) for project implementation. The PPD will chair the PSC and be responsible for providing government oversight and guidance to the project implementation. The PPD will not be paid from the project funds, but will represent a Government in-kind contribution to the Project.

229. The UNDP Country Office (UNDP-CO) will be responsible for: (i) providing financial and audit services to the project; (ii) overseeing financial expenditures against project budgets approved by PSC;

(iii) appointment of independent financial auditors and evaluators; and (iv) ensuring that all activities including procurement and financial services are carried out in strict compliance with UNDP/GEF procedures. A UNDP staff member will be assigned the responsibility for the day-to-day management and control over project finances.

230. The *Project Steering Committee* (PSC) will be convened by the provincial government. MOF, UNDP and HFD are the key members of the PSC, it will comprise relevant provincial agencies and membership by those agencies should remain consistent. The PSC will serve as the project's coordination and decision-making body. The PSC meetings will be chaired by the PPD. It will meet according to necessity, but not less than once in 12 months, to review project progress, approve project work plans and approve major project deliverables. The PSC is responsible for ensuring that the project remains on course to deliver products of the required quality to meet the outcomes defined in the project document.

231. In addition to the PPD, the following HFD staff have been nominated to participate in the PSC: Director of project office:

a. Director, Hainan Bureau of Wild Animal and Plant Conservation, HFD
b. Deputy director, Hainan Bureau of Wild Animal and Plant Conservation, HFD
c. Hainan Bureau of Wild Animal and Plant Conservation, HFD
d. Director of Office of Finance, HFD
e. Director of Division of Silviculture, HFD
f. Director of Dongzhaigang NNR Bureau

232. The PSC will also include in its composition representation of the following stakeholders: Hainan Department of Finance (HDF), Hainan Forestry Department (HFD), Hainan Land Environment and Resources Department (HLERD) and Hainan Marine and Fisheries Department (HMFD) (as other PA system management authorities), Hainan Development and Reform Commission, Hainan Water Resources Department, Hainan Tourism Commission and UNDP.

233. Specific PSC membership and terms of reference will be finalized during the Project Inception Workshop. Local universities, institutes and NGOs have a range of technical expertise on relevant subjects such as mangrove ecology, biodiversity conservation, fisheries management, etc, including long term research at Dongzhaigang and other nature reserves, who can be engaged to advise on this GEF supported project.

Project Management at the provincial level

234. The day-to-day administration of the project will be carried out by a *Project Management Office* (PMO) within the HFD comprised of a PMO Director, Project Manager (PM), a Project Assistant, and additional support staff. The project staff will be recruited following UNDP and HFD recruitment procedures. The PM will, with the support of the Project Assistant, manage the implementation of all project activities, including: (i) preparation/updates of project work and budget plans, record keeping, accounting and quarterly and annual progress reporting; (ii) drafting of terms of reference, technical specifications and other documents as necessary; (iii) identification, proposal of project consultants to be approved by the PSC, coordination and supervision of consultants and suppliers; (iv) organization of duty travel, seminars, public outreach activities and other project events; and (v) maintaining working contacts with project partners at the central and local levels.

235. As this project is an integral part of the CBPF *Mainstreams of Life Programme*, the Project Manager will be responsible for ensuring effective coordination and collaboration with the CBPF MSL

National Project and other provincial level projects. This will take place through specific consideration of programme needs and guidance as an agenda item at each PSC meeting, and operational coordination between the PM and MSL programme through the PMO for the national level project and other provincial project leaders. The PMO for the national-level project will be responsible for coordinating with each provincial projects and providing guiding. The PM will also liaise and work closely with all partner institutions to ensure good coordination with other complementary national programmes and initiatives.

236. The PM is accountable to the HFD and the PSC for the quality, timeliness and effectiveness of the activities carried out, as well as for the use of funds. The PM will produce Biennial Work Plan and Budget Plans to be approved by the PSC. These plans will provide the basis for allocating resources to planned activities. The PM will further produce quarterly operational reports and Annual Progress Reports (APR) for submission to the PSC. These reports will summarize the progress made by the project versus the expected results, explain any significant variances, detail the necessary adjustments and be the main reporting mechanism for monitoring project activities. The PM will also be technically supported by contracted national and international service providers. Recruitment of specialist services for the project will be done by the PM in consultation with the UNDP and the HFD. The organigram for project management (see **Section IV Part II**) illustrates the working relationship between all the main project implementing parties or bodies.

Project Management at the Site Level

237. Under the supervision of the central Project Management Office, project management for the implementation of activities at the selected demonstration sites (primarily Dongzhaigang NNR, also Qinglangang PNR, and some activities at Xinying NWP, Dongfang PNR and Sanya City NR) will be coordinated through a management base for the mangrove PA network at Dongzhaigang and implemented by the PA staff of the respective Nature Reserve Management Offices. Implementation should be integrated with the PA workplan and normal operational duties of the nature reserves to maximize synergies and avoid conflicts. Site level demonstration activities will be guided by Site Stakeholder Committees involving the reserve management authorities, related local government agencies and local community partners involved in co-management programmes. There will be equitable representation of women and ethnic minorities on site stakeholder committees and groups related to community co-management, alternative livelihoods and awareness activities. Please refer to the **Stakeholder Participation Plan** for further information.

238. Some specific activities may be coordinated by local government (e.g. county and city levels) rather than by specific demonstration sites, in which case the respective local offices of Hainan Forestry Department would be responsible for implementation, again under the supervision of the central Project Management Office.

PART IV: Monitoring and Evaluation Plan and Budget

MONITORING AND REPORTING[63]

239. Project monitoring and evaluation will be conducted in accordance with established UNDP and GEF procedures and will be provided by the project team and the UNDP Country Office (UNDP-CO) with support from the UNDP/GEF Regional Coordination Unit in Bangkok. The Strategic Results Framework in **Section II** provides performance and impact indicators for project implementation along with their corresponding means of verification. The BD-1 Tracking Tool incorporating METT forms and Financial Sustainability Scorecard (see **Annex 1**), Capacity Assessment Scorecard (see **Annex 2**) and Ecosystem Health Index (see **Annex 3**) will all be used as instruments to monitor progress in PA management effectiveness. The M&E plan includes: inception report, project implementation reviews, quarterly and annual review reports, and mid-term and final evaluations. The following sections outline the principal components of the Monitoring and Evaluation Plan and indicative cost estimates related to M&E activities. The project's Monitoring and Evaluation Plan will be presented and finalized in the Project's Inception Report following a collective fine-tuning of indicators, means of verification, and the full definition of project staff M&E responsibilities.

Inception Phase

240. A Project Inception Workshop will be conducted with the full project team, relevant government counterparts, co-financing partners, the UNDP-CO and representation from the UNDP-GEF Regional Coordinating Unit, as well as UNDP-GEF (HQs) as appropriate. A fundamental objective of the Inception Workshop will be to assist the project team to understand and take ownership of the projects goal and objective, as well as finalize preparation of the project's first Annual Work Plan (AWP) on the basis of the Strategic Results Framework. This will include reviewing the logframe (indicators, means of verification, assumptions), imparting additional detail as needed, and on the basis of this exercise, finalizing the AWP with precise and measurable performance indicators, and in a manner consistent with the expected outcomes for the project. Additionally, the purpose and objective of the Inception Workshop (IW) will be to: (i) introduce project staff to the UNDP-GEF team which will support the project during its implementation, namely the CO and responsible Regional Coordinating Unit staff; (ii) detail the roles, support services and complementary responsibilities of UNDP-CO and RCU staff vis à vis the project team; (iii) provide a detailed overview of UNDP-GEF reporting and monitoring and evaluation (M&E) requirements, with particular emphasis on the Annual Project Implementation Reviews (PIRs) and related documentation, the Annual Progress Report (APR), as well as mid-term and final evaluations. Equally, the IW will provide an opportunity to inform the project team on UNDP project related budgetary planning, budget reviews, and mandatory budget rephasings. The IW will also provide an opportunity for all parties to understand their roles, functions, and responsibilities within the project's decision-making structures, including reporting and communication lines, and conflict resolution mechanisms. The Terms of Reference for project staff and decision-making structures will be discussed again, as needed, in order to clarify for all, each party's responsibilities during the project's implementation phase.

Monitoring responsibilities and events

241. A detailed schedule of project review meetings will be developed by the project management, in consultation with project implementation partners and stakeholder representatives and incorporated in the Project Inception Report. Such a schedule will include: (i) tentative time frames for Project Steering

[63] As per GEF guidelines, the project will also be using the BD 1 Management Effectiveness Tracking Tool (METT). New or additional GEF monitoring requirements will be accommodated and adhered to once they are officially launched.

Committee Meetings and (ii) project related Monitoring and Evaluation activities. Day-to-day monitoring of implementation progress will be the responsibility of the Project Manager based on the project's Annual Work Plan and its indicators. The Project Manager will inform the UNDP-CO of any delays or difficulties faced during implementation so that the appropriate support or corrective measures can be adopted in a timely and remedial fashion. The Project Manager will fine-tune the progress and performance/impact indicators of the project in consultation with the full project team at the Inception Workshop with support from UNDP-CO and assisted by the UNDP-GEF Regional Coordinating Unit. Specific targets for the first year implementation progress indicators together with their means of verification will be developed at this Workshop. These will be used to assess whether implementation is proceeding at the intended pace and in the right direction and will form part of the Annual Work Plan. Targets and indicators for subsequent years would be defined annually as part of the internal evaluation and planning processes undertaken by the project team.

242. Measurement of impact indicators related to global biodiversity benefits will occur according to the schedules defined in the Inception Workshop, using METT and EHI scores. The measurement of these will be undertaken through subcontracts or retainers with relevant institutions. Periodic monitoring of implementation progress will be undertaken by the UNDP-CO through quarterly meetings with the Implementing Partner, or more frequently as deemed necessary. This will allow parties to take stock and to troubleshoot any problems pertaining to the project in a timely fashion to ensure smooth implementation of project activities.

243. Annual Monitoring will occur through the PSC Meetings (PSCM). This is the highest policy-level meeting of the parties directly involved in the implementation of a project. The project will be subject to PSCMs at least once a year. The first such meeting will be held within the first six months of the start of full implementation.

244. The Project Manager in consultations with UNDP-CO and UNDP-GEF RCU will prepare a UNDP/GEF PIR during the months of June-August. In addition, the Project Manager, in consultation with UNDP-CO will prepare an APR by the end of January and submit it to PSC members at least two weeks prior to the PSCM for review and comments. The APR will be used as one of the basic documents for discussions in the PSCM. The Project Manager will present the APR (and if needed the PIR) to the Project Steering Committee, highlighting policy issues and recommendations for the decision of the PSCM participants. The Project Manager also informs the participants of any agreement reached by stakeholders during the PIR/ARR preparation on how to resolve operational issues. Separate reviews of each project component may also be conducted if necessary. The PSC has the authority to suspend disbursement if project performance benchmarks are not met. Benchmarks will be developed at the Inception Workshop, based on delivery rates, and qualitative assessments of achievements of outputs.

245. The terminal PSCM is held in the last month of project operations. The Project Manager is responsible for preparing the Terminal Report and submitting it to UNDP-CO and UNDP-GEF RCU. It shall be prepared in draft at least two months in advance of the terminal PSCM in order to allow review, and will serve as the basis for discussions in the PSCM. The terminal meeting considers the implementation of the project as a whole, paying particular attention to whether the project has achieved its stated objectives and contributed to the broader environmental objective. It decides whether any actions are still necessary, particularly in relation to sustainability of project results, and acts as a vehicle through which lessons learnt can be captured to feed into other projects under implementation of formulation.

246. UNDP Country Offices and UNDP-GEF RCU as appropriate, will conduct yearly visits to project sites based on an agreed upon schedule to be detailed in the project's Inception Report/Annual Work Plan

to assess first hand project progress. Any other member of the Project Steering Committee can also accompany.

Project Reporting

247. The Project Manager in conjunction with the UNDP-GEF extended team will be responsible for the preparation and submission of the following reports that form part of the monitoring process. The first six reports are mandatory and strictly related to monitoring, while the last two have a broader function and the frequency and nature is project specific to be defined throughout implementation.

248. A Project Inception Report will be prepared immediately following the Inception Workshop. It will include a detailed Biennial Work Plan divided in quarterly time-frames detailing the activities and progress indicators that will guide implementation during the first year of the project. This Work Plan will include the dates of specific field visits, support missions from the UNDP-CO or the Regional Coordinating Unit (RCU) or consultants, as well as time-frames for meetings of the project's decision making structures. The Report will also include the detailed project budget for the first full year of implementation, prepared on the basis of the Annual Work Plan, and including any monitoring and evaluation requirements to effectively measure project performance during the targeted 12 months time-frame. The Inception Report will include a more detailed narrative on the institutional roles, responsibilities, coordinating actions and feedback mechanisms of project related partners. In addition, a section will be included on progress to date on project establishment and start-up activities and an update of any changed external conditions that may effect project implementation. When finalized, the report will be circulated to project counterparts who will be given a period of one calendar month in which to respond with comments or queries. Prior to this circulation of the IR, the UNDP Country Office and UNDP-GEF's Regional Coordinating Unit will review the document.

249. An Annual Progress Report (APR) shall be prepared by the Project Manager and shared with the Project Steering Committee. As a self-assessment by the project management, it does not require a cumbersome preparatory process. As minimum requirement, the Annual Review Report shall consist of the Atlas standard format for the Project Progress Report (PPR) covering the whole year with updated information for each element of the PPR as well as a summary of results achieved against pre-defined annual targets at the project level. As such, it can be readily used to spur dialogue with the Project Steering Committee and partners. An ARR will be prepared on an annual basis prior to the Project Steering Committee meeting to reflect progress achieved in meeting the project's Annual Work Plan and assess performance of the project in contributing to intended outcomes through outputs and partnership work. The ARR should consist of the following sections: (i) project risks and issues; (ii) project progress against pre-defined indicators and targets and (iii) outcome performance.

250. The Project Implementation Review (PIR) is an annual monitoring process mandated by the GEF. It has become an essential management and monitoring tool for project managers and offers the main vehicle for extracting lessons from ongoing projects. Once the project has been under implementation for a year, a Project Implementation Report must be completed by the CO together with the project team. The PIR should be participatorily prepared in July and discussed with the CO and the UNDP/GEF Regional Coordination Unit during August with the final submission to the UNDP/GEF Headquarters in the first week of September.

251. Quarterly Progress Reports (QPR): Short reports outlining main updates in project progress will be provided quarterly to the local UNDP Country Office and the UNDP-GEF RCU by the project team.

252. UNDP ATLAS Monitoring Reports: A Combined Delivery Report (CDR) summarizing all project expenditures, is mandatory and should be issued quarterly following the finalization of the quarterly. The Project Manager should send it to the Project Steering Committee for review and the Implementing Partner should certify it. The following logs should be prepared: (i) The Issues Log is used to capture and track the status of all project issues throughout the implementation of the project. It will be the responsibility of the Project Manager to track, capture and assign issues, and to ensure that all project issues are appropriately addressed; (ii) the Risk Log is maintained throughout the project to capture potential risks to the project and associated measures to manage risks. It will be the responsibility of the Project Manager to maintain and update the Risk Log, using Atlas; and (iii) the Lessons Learned Log is maintained throughout the project to capture insights and lessons based on good and bad experiences and behaviours. It is the responsibility of the Project Manager to maintain and update the Lessons Learned Log.

253. Project Terminal Report: During the last three months of the project the project team will prepare the Project Terminal Report. This comprehensive report will summarize all activities, achievements and outputs of the Project, lessons learnt, objectives met, or not achieved, structures and systems implemented, etc. and will be the definitive statement of the Project's activities during its lifetime. It will also lay out recommendations for any further steps that may need to be taken to ensure sustainability and replicability of the Project's activities.

254. Periodic Thematic Reports: As and when called for by UNDP, UNDP-GEF or the Implementing Partner, the project team will prepare Specific Thematic Reports, focusing on specific issues or areas of activity. The request for a Thematic Report will be provided to the project team in written form by UNDP and will clearly state the issue or activities that need to be reported on. These reports can be used as a form of lessons learnt exercise, specific oversight in key areas, or as troubleshooting exercises to evaluate and overcome obstacles and difficulties encountered. UNDP is requested to minimize its requests for Thematic Reports, and when such are necessary will allow reasonable timeframes for their preparation by the project team.

255. Technical Reports are detailed documents covering specific areas of analysis or scientific specializations within the overall project. As part of the Inception Report, the project team will prepare a draft Reports List, detailing the technical reports that are expected to be prepared on key areas of activity during the course of the Project, and tentative due dates. Where necessary this Reports List will be revised and updated, and included in subsequent APRs. Technical Reports may also be prepared by external consultants and should be comprehensive, specialized analyses of clearly defined areas of research within the framework of the project and its sites. These technical reports will represent, as appropriate, the project's substantive contribution to specific areas, and will be used in efforts to disseminate relevant information and best practices at local, national and international levels.

256. Project Publications such as knowledge products and compilations of lessons learned will form a key method of crystallizing and disseminating the results and achievements of the Project. These publications may be scientific or informational texts on the activities and achievements of the Project, in the form of journal articles, multimedia publications, etc. These publications can be based on Technical Reports, depending upon the relevance, scientific worth, etc. of these Reports, or may be summaries or compilations of a series of Technical Reports and other research. The project team will determine if any of the Technical Reports merit formal publication, and will also (in consultation with UNDP, the government and other relevant stakeholder groups) plan and produce these Publications in a consistent and recognizable format. Project resources will need to be defined and allocated for these activities as appropriate and in a manner commensurate with the project's budget.

INDEPENDENT EVALUATIONS, AUDITS AND FINANCIAL REPORTING

257. The project will be subjected to at least two independent external evaluations as follows: An independent Mid-Term Review will be undertaken at exactly the mid-point of the project lifetime. The Mid-Term Reviewwill determine progress being made towards the achievement of outcomes and will identify course correction if needed. It will focus on the effectiveness, efficiency and timeliness of project implementation; will highlight issues requiring decisions and actions; and will present initial lessons learned about project design, implementation and management. Furthermore, it will review and update the ESSP report. Findings of this review will be incorporated as recommendations for enhanced implementation during the final half of the project's term. The organization, terms of reference and timing of the mid-term reviewwill be decided after consultation between the parties to the project document. The Terms of Reference for this Mid-term reviewwill be prepared by the UNDP CO based on guidance from the UNDP-GEF Regional Coordinating Unit.

258. An independent Final Evaluation will take place three months prior to the terminal Project Steering Committee meeting, and will focus on the same issues as the mid-term evaluation. The final evaluation will also look at impact and sustainability of results, including the contribution to capacity development and the achievement of global environmental goals. The Final Evaluation should also provide recommendations for follow-up activities. The Terms of Reference for this evaluation will be prepared by the UNDP CO based on guidance from the UNDP-GEF Regional Coordinating Unit.

LEARNING AND KNOWLEDGE SHARING

259. As an integral part of the UNDP/GEF CBPF MSL programme, results and lessons learned will be shared through the programme's framework, used to inform similar work under other CBPF MSL provincial projects, and to support the development of national policies, guidelines, regulations, financial mechanisms as well as data sharing platforms through the national level project. This is budgeted as part of the project's M&E plan.

260. The project will develop a communications strategy in the first year, which will be updated annually and implementation supported by a communications, education and awareness specialist. This will include capturing and disseminating lessons learned, for review at PSC meetings in order to inform the direction and management of the project, and shared with project stakeholders as appropriate. A full colour popular style project completion report will document the project's stories, achievements and lessons learned at the end of the project.

261. Results from the project will also be disseminated within and beyond the project intervention zone through a number of existing information sharing networks and forums. In addition, the project will participate, as relevant and appropriate, in UNDP/GEF sponsored networks, organized for Senior Personnel working on projects that share common characteristics. UNDP/GEF Regional Unit has established an electronic platform for sharing lessons between the project coordinators. The project will identify and participate, as relevant and appropriate, in scientific, policy-based and/or any other networks, which may be of benefit to project implementation though lessons learned. The project will identify, analyze, and share lessons learned that might be beneficial in the design and implementation of similar future projects. Identify and analyzing lessons learned is an on- going process, and the need to communicate such lessons as one of the project's central contributions is a requirement to be delivered not less frequently than once every 12 months. UNDP/GEF shall provide a format and assist the project team in categorizing, documenting and reporting on lessons learned.

COMMUNICATIONS AND VISIBILITY REQUIREMENTS

262. Full compliance is required with UNDP's Branding Guidelines and guidance on the use of the UNDP logo. These can be accessed at http://web.undp.org/comtoolkit/reaching-the-outside-world/outside-world-core-concepts-visual.shtml. Full compliance is also required with the GEF Branding Guidelines and guidance on the use of the GEF logo. These can be accessed at http://www.thegef.org/gef/GEF_logo. The UNDP and GEF logos should be the same size. When both logs appear on a publication, the UNDP logo should be on the left top corner and the GEF logo on the right top corner. Further details are available from the UNDP-GEF team based in the region.

263. Full compliance is also required with the GEF's Communication and Visibility Guidelines (the "GEF Guidelines"). The GEF Guidelines can be accessed at: http://www.thegef.org/gef/sites/thegef.org/files/documents/C.40.08_Branding_the_GEF%20final_0.pdf Amongst other things, the GEF Guidelines describe when and how the GEF logo needs to be used in project publications, vehicles, supplies and other project equipment. The GEF Guidelines also describe other GEF promotional requirements regarding press releases, press conferences, press visits, visits by Government officials, productions and other promotional items.

264. Where other agencies and project partners have provided support through co-financing, their branding policies and requirements should be similarly applied.

AUDIT CLAUSE

265. The Government will provide the Resident Representative with certified periodic financial statements, and with an annual audit of the financial statements relating to the status of UNDP (including GEF) funds according to the established procedures set out in the Programming and Finance manuals. The Audit will be conducted according to UNDP financial regulations, rules and audit policies by the legally recognized auditor of the Government, or by a commercial auditor engaged by the Government.

TABLE 11. M&E ACTIVITIES, RESPONSIBILITIES, BUDGET AND TIME FRAME

Type of M&E activity	**Responsible Parties**	**Budget US$** *Excluding project team staff time*	**Time frame**
Inception Workshop	Project Manager UNDP CO UNDP GEF	10,000	Within first three months of project start up
Inception Report	Project Team UNDP CO	None	Submit draft two weeks before the IW, finalize it immediately following IW
Measurement of Means of Verification for Project Purpose Indicators	Project Manager will oversee the hiring of specific studies and institutions, and delegate responsibilities to relevant team members	To be finalized in Inception Phase and Workshop. Indicative cost: 15,000.	Start, mid and end of project
Measurement of Means of Verification for Project Progress and Performance (measured on an annual basis)	Oversight by Project Manager Project team	None	Annually prior to ARR/PIR and to the definition of annual work plans

Type of M&E activity	**Responsible Parties**	**Budget US$** *Excluding project team staff time*	**Time frame**
APR and PIR	Project Team UNDP-CO UNDP-GEF	None	Annually
Quarterly Progress Reports	Project team	None	Quarterly
CDRs	Project Manager	None	Quarterly
Issues Log	Project Manager UNDP CO Programme Staff	None	Quarterly
Risks Log	Project Manager UNDP CO Programme Staff	None	Quarterly
Lessons Learned Log	Project Manager UNDP CO Programme Staff	None	Quarterly
Mid-term Review, including ESSP review	Project team UNDP- CO UNDP-GEF Regional Coordinating Unit External Consultants (i.e. reviewteam)	40,000	At the mid-point of project implementation.
Final Evaluation	Project team, UNDP-CO UNDP-GEF Regional Coordinating Unit External Consultants (i.e. evaluation team)	40,000	At the end of project implementation
Terminal Report	Project team UNDP-CO local consultant	0	At least one month before the end of the project
Lessons learned	Project team UNDP-GEF Regional Coordinating Unit (suggested formats for documenting best practices, etc)	15,000	Yearly
Audit	UNDP-CO Project team	22,000	Yearly
TOTAL indicative COST *Excluding project team staff time and UNDP staff and travel expenses*		US$ 142,000	

PART V: Legal Context

266. This Project Document shall be the instrument referred to as such in Article I of the Standard Basic Assistance Agreement between the Government of Hainan Province, People's Republic of China and the United Nations Development Programme, signed by the parties on January 29, 1979. The host country-implementing agency shall, for the purpose of the Standard Basic Assistance Agreement, refer to the government co-operating agency described in that Agreement.

267. The UNDP Resident Representative in Beijing is authorized to effect in writing the following types of revision to this Project Document, provided that he/she has verified the agreement thereto by the UNDP-EEG Unit and is assured that the other signatories to the Project Document have no objection to the proposed changes:

a) Revision of, or addition to, any of the annexes to the Project Document;

b) Revisions which do not involve significant changes in the immediate objectives, outputs or activities of the project, but are caused by the rearrangement of the inputs already agreed to or by cost increases due to inflation;

c) Mandatory annual revisions which re-phase the delivery of agreed project inputs or increased expert or other costs due to inflation or take into account agency expenditure flexibility; and

d) Inclusion of additional annexes and attachments only as set out here in this Project Document.

SECTION II: STRATEGIC RESULTS FRAMEWORK (SRF) AND GEF INCREMENT

PART I: Strategic Results Framework, SRF (formerly GEF Logical Framework) Analysis

INDICATOR FRAMEWORK AS PART OF THE SRF

Project's Development Goal: To contribute to the conservation and sustainable use of globally significant biodiversity in Hainan Province, China

Objective/ Outcome	Indicator	Baseline	End of Project target	Source of Information	Risks and assumptions
Objective To strengthen the management effectiveness of the wetland protected area system in Hainan in response to existing and emerging threats to the globally	The area of ecosystems covered by Hainan's terrestrial PA system increases by at least 40,000 ha with improved coverage of under-represented types by 2018 in line with the draft PA System Master Plan, project strategy and action plan for the wetland PA subsystem and climate	Hainan's terrestrial PA system covers 285,600 ha (See inset table below for baseline areas)	Hainan's terrestrial PA system covers at least 325,600 ha by 2018 (see inset table below for targets)	Official Hainan Provincial government statistics and reports on the PA system.	Risks: – Lack of incentives and poor enforcement of planning priorities will hinder mainstreaming wetland PAs into sectors Assumption: – The national and provincial governments remains

<table>
<tr><th>Objective/ Outcome</th><th>Indicator</th><th>Baseline</th><th>End of Project target</th><th>Source of Information</th><th>Risks and assumptions</th></tr>
<tr><td rowspan="3">significant biodiversity and essential ecosystem services</td><td>change resilience strategy.</td><td colspan="2"><table><tr><th>Vegetation Type</th><th>Current (Km^2)</th><th>Target (Km^2)</th></tr><tr><td>32a[64]</td><td>7.6</td><td>15</td></tr><tr><td>33a</td><td>9.6</td><td>15</td></tr><tr><td>41a</td><td>8.5</td><td>15</td></tr><tr><td>43c</td><td>0</td><td>15</td></tr><tr><td>44</td><td>36.5</td><td>40</td></tr><tr><td>80b</td><td>1.5</td><td>5</td></tr></table>See Annex 10 for distributions</td><td></td><td rowspan="3">committed to strengthening the PA system and to incremental growth in their financing allocations for the protected area system</td></tr>
<tr><td>Strengthened management effectiveness of 7 PAs in the Hainan Mangrove PA Network indicated by METT scores:

Dongzhaigang NNR
Xinying Mangrove NWP
Qinglangang PNR
Dongfang PNR
Sanya City NR[65]
Xinying Bay City NR[66]
Huachang Bay County NR</td><td>METT Baseline scores:

43
26
39
45
30
15
27</td><td>METT target scores:

70
50
60
65
50
50
50</td><td>Project reports on METT applied at PPG, Midterm and project completion
[Note: because of capacity issue, the baseline and target scores should be further defined during the inception phase and described in the Inception Report]</td></tr>
<tr><td>Planned improvement in the financial sustainability of the provincial PA system at site and system level indicated by Part II of the GEF financial sustainability</td><td>Financial scorecard baselines:</td><td>Financial scorecard targets:</td><td>Project reports on Financial Sustainability Scorecard</td></tr>
</table>

[64] 32a Tropical semi-evergreen monsoon forest on laterite, 33a Tropical evergreen lowland forest, 41a Tropical acid shrub forest (Melastoma), 43c Tropical limestone forest, 44 Mangroves, 80b Tropical coastal savannah thorny forest. See **Annex 10** for distributions. Note: this information is now outdated, and will be revised during project implementation once the Hainan PA Master Plan has been approved and Second National Wetland Inventory Assessment results are available.

[65] A complex of three mangrove NRs: Sanyahe NR, Qingmeigang NR and Tielugang NR

[66] Overlaps with Xinying Mangrove NWP but separate administration

Objective/ Outcome	Indicator	Baseline	End of Project target	Source of Information	Risks and assumptions
	scorecard: - Component 1 – Legal, regulatory and institutional frameworks - Component 2 – Business planning and tools for cost- effective management - Component 3 – Tools for revenue generation	31% 31% 11%	60% 56% 30%		
Outcome 1. Improved protection and management of Hainan's ecosystems through expansion, consolidation and sustainable financing of the provincial PA system	**Outputs:** 1.1 PA system consolidation, expansion and sustainable financing 1.2 Provincial guidelines for management and zoning of coastal wetland PAs 1.3 Strengthened PA system supervisory capacity				
	Financing Plan for the expanded PA system under Hainan Master Plan for the PA System including strategy and action plan for the wetland PA subsystem	Master Plan for Hainan PA System awaiting approval, no financing plan	Financing Plan approved for the expanded PA system under Hainan Master Plan for the PA System including strategy and action plan for the wetland PA subsystem	Official Hainan provincial government document indicating approval of the financing plan for the expanded PA System.	<u>Risks</u>: - Economic development such as mass tourism stimulated by the International Tourism Island Development strategy will exert more threats to the mangrove forest in Hainan Province, due to disturbance, consumption of shrimp and other seafood, encroachment of forest land by tourism facilities. <u>Assumption</u>: – The Provincial Government
	National and provincial financing for PA system through HFD increased to close the existing annual financing gap of US$6.69	Annual financing available for PA System: US$ 8.06 million	Annual financing available for PA System + Projected annual financing gap for basic expenditure	PA Sustainable Financing scorecard; HFD annual financial reports	

Objective/ Outcome	Indicator	Baseline	End of Project target	Source of Information	Risks and assumptions
	million for basic expenditure scenario[67]	/ year	scenario in year 2012+5: US$19.92 million per year		continues to be committed to the extension and improved management of the PA system in the face of other demands for land and resources.
	d PA system management capacity of Hainan Forestry Department, Land Environment & Resources Department, and Marine and Fisheries Department as shown by the UNDP Capacity Scorecard	Capacity Scorecard baselines : HFD: 50% HLERD: 56% HMFD: 74%	Capacity Scorecard targets: HFD: 65% HLERD: 65% HMFD: 80%	Project reports on Capacity Scorecard	
Outcome 2. Strengthened protection, participatory management and restoration of mangrove forests through the development of a Mangrove PA Network (MPAN)	**Outputs:** 2.1 Mangrove PA Network established and recognized in PA system plans 2.2 Professional competency standards applied to staff of Mangrove PA Network Sites 2.3 Ecosystem Health Index monitoring introduced for Mangrove PA Network sites, supported by applied research 2.4 Improved management planning and strengthened buffer zones through mangrove protection and restoration for demonstration Mangrove PA Network sites 2.5 Protection status of mangrove PAs strengthened through network 2.6 Community co-management programmes established at demonstration sites 2.7 Increased awareness of the values of mangrove PAs supports conservation				
	Operational MPAN is evident through: i) Official recognition of Mangrove PA Network in Hainan PA system plans. ii) Network coordination centre and training base established at	Mangrove PAs are not networked, lack of common management methods and standards, limited	Operational MPAN evident through: i) Official recognition of Mangrove PA Network in Hainan PA	Official HFD statements, plans and reports on the Hainan PA system; project reports.	Risks: - Major economic development projects (e.g. coastal reclamation, port development, tourism development, infrastructure, etc) take precedence over

[67] See Annex 1 Financial Scorecard sheet for details: Line 105: existing annual financing gap for basic expenditure scenario; Baseline = Line 72 - existing annual financing available for PA System; Target = baseline (Line 72) + Line 116 (Projected annual financing gap for basic expenditure scenario in year 2012+5)

Objective/ Outcome	Indicator	Baseline	End of Project target	Source of Information	Risks and assumptions
	Dongzhaigang NNR iii) All MPAN sites upload and update required site information to MPAN database according to agreed protocols	information exchange	system plans. ii) Network coordination centre and training base established at Dongzhaigang NNR iii) All MPAN sites upload and update required site information to MPAN database according to agreed protocols		mangrove conservation. - Severity of climate change impacts (including sea level change, bleaching of corals and increased incidence and duration of extreme weather (e.g., floods and drought) may undermine conservation efforts promoted by the project through changes in mangrove distribution and changes in community resource use <u>Assumption</u>: - National, provincial and local agencies responsible for mangrove conservation are receptive to a networking approach to mangrove PA management and agree to provide their full cooperation.
	Improved ecosystem health status of the selected Hainan mangrove PA network sites, indicated by the improvement in the MSL's Ecosystem Health Index (EHI) *EHI baselines & targets to be established in Year 1 for other sites: Dongfang PNR, Sanya City NR, Xinying Bay City NR, Huachang Bay County NR	EHI baselines for selected sites*: Dongzhaigang NNR: 0.468 Qinglangang PNR: 0.444 Xinying mangrove NWP: 0.441	EHI targets for selected sites*: Dongzhaigang NNR: 0.600 Qinglangang PNR: 0.600 Xinying mangrove NWP: 0.600	Project reports on EHI monitoring at PPG, Midterm and Project completion	
	Increased protection status of selected wetland related reserves, taking full account of access and benefit sharing rights of indigenous / minority ethnic group stakeholders.	1. Yinggeling PNR** (50,464 ha); 2. Fanjia PNR (>5,000 ha); 3. Haiwei Prov. Wetland Park (c.300 ha)	1. Yinggeling PNR becomes NNR; 2. Fanjia PNR becomes the demonstration area of PNR; 3. Haiwei County Wetland Park	Official government documents required for upgrading of the selected provincial level PAs to National level PAs; dates of submission to State Council; official State Council approval announcements.	

Objective/ Outcome	Indicator	Baseline	End of Project target	Source of Information	Risks and assumptions
	**Yinggeling is a forested catchment area for Haikou area	4. Sanya City NR (728ha)	becomes PWP. 4. Sanya City NR becomes the demonstration area of NR		
	Increase in the number of wintering Black-faced Spoonbills *Platalea minor* in Hainan	Wintering population of 46 BF Spoonbills	Wintering population of 76 BF Spoonbil`ls with a stable or increasing trend	Scientific monitoring results published in relation to implementation of the CMS International Single Species Action Plan for the BF Spoonbill; project reports	
	Viable alternative options are demonstrated for target communities impacting mangrove resources at Dongzhaigang and Qinglangang that result in more sustainable resource use and include the equitable representation and involvement of women.	No assistance available from PA system to help local communities with economic opportunities	New co-management structures are established that support and strengthen alternative livelihood options for target communities, including equitable representation and involvement of women.	Co-management agreements, site management plans and project progress reports	
	Increased area of mangrove cover within and adjacent to project demonstration reserves through replanting activities in unproductive aquaculture ponds and other suitable areas	See table inset below for baseline area of mangrove cover and area of existing replanting efforts at selected sites	1,000 ha of mangrove wetland consisting of wetland park and bird habitats.	Project reports on mangrove re-forestation activities supported by GIS maps	

Objective/ Outcome	Indicator	Baseline	End of Project target	Source of Information	Risks and assumptions
	Site	**Mangrove Area**	**Existing Replanted Area**	**Project Target Area** (Additional Replanting)	
	Dongzhaigang NNR	1578 ha	60 ha	600 ha	
	Qinglangang PNR	1233 ha	0 ha	300 ha	
	Xinying NWP	150 ha	<10 ha	<10 ha	
	Dongfang PNR	250 ha	<15 ha	50 ha	
	Sanya CNR	60 ha	10 ha	50 ha	
	Total	**3271 ha**	**<95 ha**	**1000+ ha**	
Outcome 3. Improved integration of wetland conservation into development and sectoral planning and practices through a strengthened PA System Management Framework including economic valuation of ecosystem services	**Outputs:** 3.1 Capacity developed to strengthen inter-sectoral coordination and mainstreaming PA system objectives into provincial development and sectoral planning processes 3.2 Sector specific standards and safeguards developed to protect wetland PAs 3.3 Awareness raised of the economic value of mangrove wetland ecosystem services 3.4. Online database for wetland PA and biodiversity information				
	Sector specific standards for tourism and coastal fisheries are consistent with international standards for responsible ecotourism and fishery practices	Existing plans and practices for key sectors including tourism and fishery development do not adequately address key issues for wetland PAs	Approval and demonstrated voluntary uptake of sector specific standards for tourism by 20 companies (based on ecotourism category of the ASEAN Tourism Standards[68]) and coastal fisheries by 2 villages (based on the FAO Code of Conduct for	Official government documents endorsed by provincial tourism and fisheries agencies	Risks: - Mainstreaming wetland PAs into sectoral policies will be hindered by lack of incentives for other sectors and poor enforcement of agreed priorities and plans that may be incompatible with larger tourism development, land conversion or other development programmes. Assumption:

[68] ASEAN Tourism Standards. ASEAN Secretariat, Jakarta. http://www.aseansec.org/23074.pdf

Objective/ Outcome	Indicator	Baseline	End of Project target	Source of Information	Risks and assumptions
			Responsible Fisheries[69] and related guidelines)		- Sectors are receptive towards collaboration and interested in contributing towards sustainable development and conservation of wetlands
	Key development and sectoral plans such as the 13th 5-year plan and subsidiary plans for key sectors include explicit reference to conservation of the Mangrove PA Network	12th 5-year plan and subsidiary plans for tourism, fisheries, water resources and other key sectors do not adequately address wetland conservation	13th 5-year plan and subsidiary plans for tourism (including the Hainan International Tourism Island Master Plan), fisheries, water resources and other key sectors include explicit reference to conservation of the Mangrove PA Network	Official government documents endorsed by the respective provincial government agencies	
	Establishment of a suitable cross-sectoral body at provincial level to facilitate mainstreaming of wetland conservation into sectoral policies, plans and practices	Coordination between wetland PA subsystem management and development planning and sectoral planning	A permanent cross-sectoral body is established at provincial level, formally recognized by all sectors and	Project reports, minutes of provincial government agency meetings, TOR and membership of the cross-sectoral body, minutes of meetings.	

[69] See: http://www.fao.org/docrep/013/i1900e/i1900e.pdf and http://www.fao.org/docrep/005/v9878e/v9878e00.HTM (includes Chinese language version); and http://www.fao.org/tc/resource-mobilization/ifas/ccrf/en/ for technical guidelines.

<table>
<tr><th>Objective/ Outcome</th><th>Indicator</th><th>Baseline</th><th>End of Project target</th><th>Source of Information</th><th>Risks and assumptions</th></tr>
<tr><td></td><td></td><td>occurs but is largely responsive and ad hoc</td><td>proactively promoting and facilitating strategic inter-sectoral coordination on wetland conservation</td><td></td><td></td></tr>
<tr><td></td><td>Awareness of the value of Hainan’s mangrove ecosystem services is increased across a cross-section of provincial audiences (the end-of-project assessment will include gender disaggregated data)</td><td>(See inset table below for baseline scores and Annex 6 for details</td><td>Baseline + 50% increase in awareness levels using the same methodology in the final year of the project (see inset table below)</td><td>Project reports on awareness assessments applied at PPG and project completion.</td><td></td></tr>
<tr><td></td><td colspan="4"><table>
<tr><th></th><th>Full scores</th><th>Scores attained</th><th>% of full scores</th><th>Target % of full scores</th></tr>
<tr><td>Officials</td><td>49</td><td>27.0</td><td>55</td><td>82</td></tr>
<tr><td>Enterprise</td><td>45</td><td>22.5</td><td>50</td><td>75</td></tr>
<tr><td>NGO</td><td>36</td><td>19.4</td><td>54</td><td>81</td></tr>
<tr><td>Media</td><td>46</td><td>26.6</td><td>58</td><td>87</td></tr>
<tr><td>Student</td><td>40</td><td>19.4</td><td>49</td><td>73</td></tr>
<tr><td>Rural</td><td>49</td><td>15.1</td><td>31</td><td>46</td></tr>
<tr><td>Urban</td><td>49</td><td>24.1</td><td>49</td><td>73</td></tr>
<tr><td>Sub-total</td><td>314</td><td>154.1</td><td>49</td><td>73</td></tr>
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Objective/ Outcome	Indicator	Baseline	End of Project target	Source of Information	Risks and assumptions
	Improved data sharing platform for Hainan's wetland PAs is established, regularly updated and in frequent use by a range of data providers and target audiences	Data on Hainan's wetland PAs are dispersed, largely unavailable online, and not regularly updated	A centralized database on Hainan's wetland PAs is accessible to online users, updated on a monthly basis and registers at least 100 hits per month	Project reports on data sharing platform; automated website usage statistics (e.g. google analytics).	

Abbreviation	Full Name
Dongzhaigang	Dongzhaigang National Nature Reserve
Xinying NWP	Hainan Xinying Mangrove National Wetland Park
Dongfang	Hainan Dongfang Black-faced Spoonbill Provincial Nature Reserve
Sanya	Sanyan River,Tielugang, and Yalongwan Qingmeigang City Nature Reserve
Qinglangang	Qinglangang Provincial Nature Reserve
Xinying Bay	Xinying Bay Mangrove City Nature Reserve
Huachang Bay	Huachang Bay County Mangrove Nature Reserve
Lingao	Lingao Xinying Mangrove City Nature Reserve

268. A detailed activity list and a chronogram of activities per output is under development and will be finalised upon project inception.

PART II: Incremental Cost Analysis

Baseline trends

269. Significant past losses of natural habitats and species declines have occurred in Hainan, leaving fragmented remnants that are vulnerable to the impacts of continuing rapid economic development, intensive resource use and other environmental change. This is particularly the case for coastal mangroves, as human population density, resource usage and development pressures including tourism are most intense in the coastal zone. Urgent action is needed to prevent further degradation of critical coastal wetland ecosystems and the loss of biodiversity and ecosystem services.

270. **Without the GEF investment in the proposed project**, there will be an inadequate provincial framework and limited tools for systematic management of the wetland PAs, and inadequacies in provincial regulations governing PAs and wetlands are unlikely to be addressed. The provincial Forestry Department's PA management work will remain site based with no uniform management standards nor staff competency standards required for effective PA management. Future expansion of the PA system beyond existing plans and habitat restoration will become increasing difficult due to rapidly increasing land prices and greater land use pressures, therefore this project offers a timely opportunity to consolidate the PA system.

271. While investment in the PA system will be substantial, PA management work will remain site specific and investment will continue to be mainly focused on infrastructure (management offices and buildings in towns) rather than supporting operational needs such as adequate staffing, field stations, equipment, training, information management and outreach to local stakeholders.Without increased capacity and mechanisms for engaging local stakeholders, communities in and around PAs will continue to remain marginalized and threats and conflicts related to local land uses will continue. There has also been significant investment in development of coastal protection belts and some mangrove restoration, however most of this consists of plantations of exotic species with little or no consideration of local ecological needs or impacts on the local ecology. There is a considerable existing research information base and technical capacity through local universities, however results are not mobilized into management and strategic planning due to lack of coordination with PA system managers.

272. Lack of integration of PA system plans into sectoral and development planning processes and the continuing development of coastal tourism, aquaculture, fisheries and infrastructure without ecological guidance and environmental standards will exert increasing pressures on PAs. Hence the management effectiveness of wetland PAs will remain weak and highly vulnerable to pressure from these economic sectors as well as livelihood activities from neighboring communities. As such, the Hainan PA system will remain unable to fulfill its role in safeguarding globally significant biodiversity. There is also a lack of cross-sectoral integration of plans due to independent working habits of different government departments, and information on PAs is not centralized or easily accessible. Thus the provincial and local PA management authorities will continue to have limited capacity for effective management and lack the tools and capacity for mitigating threats coming from outside the PAs.

Global Environmental Objectives

273. The project intervention will achieve the following incremental global environmental benefits: i) increased management effectiveness at the PA level through a range of interventions at Mangrove PA Network sites from a METT baseline of 15-45 (average 32.14) to 50-70 (average 56.43); ii) improving the overall PA System institutional capacity for HFD, HLERD and HMFD from a baseline of 50-74% (average 60.0%) in the Capacity Assessment Scorecard to 65-80% (average 70%); and (iii) increasing the financial sustainability of the PA system from a sustainability baseline average score of 24.3% to target

scores averaging 48.7%, as measured through UNDP's Financial Sustainability Scorecard; and (iv) expanding and significantly improving the PA system design with at least an additional 40,000 ha of terrestrial ecosystems under protection, the inclusion of specific wetland PA subsystem plans and incorporation of climate change adaptation and mitigation measures into PA system planning. Through strengthened regulations, sectoral standards, guidelines, law enforcement capacity, targeted awareness raising and community participation, the project will also incrementally reduce long term threats to wetland biodiversity including encroachment of mangrove habitats for aquaculture, tourism development and coastal development, illegal fishing and wildlife poaching activities, the spread of alien invasive species, unsustainable fishery practices impacting mangrove PAs, illegal harvesting of forest products and pollution from local settlements and aquaculture ponds.

274. The Project will generate global benefits directly for the mangrove PA network sites totaling 9,171 ha through enhanced PA effectiveness based on a collaborative approach to capacity building and demonstrated co-management approaches. By strengthening overall provincial institutional arrangements and coordinating capacities and actions to mainstream biodiversity considerations in provincial planning and decision-making, and by strengthening provincial and local PA management authorities' institutional and individual capacities, the project will also contribute to improving the overall effective management of Hainan's terrestrial PA system, with a current total land area of 285,600 ha.

Alternative

275. The project builds on the baseline by strengthening the provincial PA system as a whole and the wetland subsystem in particular. The GEF investment will enable expansion of the PA system in the Hainan Province, improving ecosystem coverage, connectivity and climate change resilience. This will be directly complemented by the improved systemic and institutional capacity of the provincial and local forestry departments for the PA system planning and management, as well as increased availability of operational funding for biodiversity management within the PAs through more comprehensive and systematic financial planning for the PA System incorporating sustainable financing mechanisms including demonstration of eco-compensation mechanisms supporting PA management and local communities. Management and zoning of coastal wetland PAs in line with mangrove and PA regulations will be improved by technical guidelines involving relevant agencies.

276. A PA network management approach will be introduced focusing on mangrove PAs. By demonstrating the provincial systematic improvement of the mangrove PAs, the project will introduce an ecosystem based approach to PA management, with the aim of replicating this strategy in other types of PAs within the province and mangrove PAs in other provinces in the country. The capacity of the mangrove PA network reserves will be enhanced collectively through mechanisms for coordination between mangrove PAs including the introduction of shared management approaches and tools such as monitoring ecosystem health, information sharing, technical exchanges, and collaboration on common issues; significant enhancement of site level management capacity through training on key issues such as law enforcement and monitoring, and introduction of professional compentency standards. Demonstration interventions will be undertaken to develop model management plans, strengthen model buffer zones, establish co-management and sustainable livelihood programmes including mangrove replanting and appropriate nature-based tourism, supported by awareness programmes.

277. While strengthening the ability of PA authorities to manage emerging threats in the PA system itself, the project also seeks to put in place and safeguard standards and measures to ensure that land and resource uses in and outside PAs, particularly in areas directly affecting the integrity of mangrove wetland biodiversity within the PAs and their broader coastal landscape, are regulated and incentives developed towards encouraging more sustainable practices. Coastal wetland conservation concerns will be embedded into cross-sectoral plans and inter-sectoral coordination improved with key sectors related to wetland PAs in order to reduce external threats. Support for wetland conservation from decision makers,

planners and the wider public will be enhanced through a targeted awareness campaign informed by a study of the economic values of mangrove ecosystem services, as well as the economic consequences of their loss and degradation, with the intention of mainstreaming wetland PAs and PA system concerns into the 13th Five-Year Plan for Hainan. Economic valuation and mainstreaming will also aim to underpin increased government financing for PA operational budgets. An online wetland PA data sharing platform will provide enhanced access to information for planners, managers and other stakeholders. Lessons will be upscaled through the CBPF MSL programme to other projects and wetlands.

System Boundary

278. The project aims to achieve the *in situ* conservation of Hainan's wetland biodiversity - fauna, flora, habitats and ecosystem processes, with a focus on mangrove ecosystems as Hainan's most significant and threatened wetland type. Geographically, the project is limited to Hainan Province, following a stratified multi-level approach to achieve the project outcomes. Some aspects of the project (Components 1 and 3) cover the entire province, including professional competency standards, institutional capacity building, PA strategic planning and financing, awareness raising and mainstreaming. Component 2 focuses on strengthening the management effectiveness of the network of mangrove PAs through a collective approach to capacity building, information sharing, management and monitoring. It also supports in-depth interventions on management planning, community co-management, mangrove restoration, economic valuation of mangrove ecosystem services, targeted awareness raising and applied research at specific demonstration sites. Overall, the project strategy aims to achieve a greatly strengthened network of wetland PAs that effectively conserves Hainan's highly important and unique mangrove ecosystems within the context of a more efficient and expanded provincial PA system with a strengthened financial basis to support operational management costs. Baseline and incremental costs have been assessed over the five-year life span of the project.

Summary of Costs

279. The Baseline associated with this project is estimated at US$100 million. The GEF Alternative has been costed at US$ 120.634 million. The total Incremental Cost to implement the full project is US$ 20.634 million. Of this amount, $2.634 million is requested from GEF. GEF funds have leveraged US$ 18.0 million in co-financing for the Alternative strategy. Costs have been estimated for five years, the duration of the planned project Alternative. These costs are summarized below in the incremental costs matrix.

TABLE 12. INCREMENTAL COST MATRIX

Cost/Benefit	Baseline (B)	Alternative (A)	Increment (A-B)
BENEFITS			
Global benefits	Inadequate legal protection, PA management capacity, financing for PA operational costs, and mainstreaming of PA system concerns into other sectors results in ineffective PA management and PA system weaknesses. Globally significant wetland ecosystems	Upgrading of legal protection for selected PAs, extension of the PA system by creation of new PAs and integration of others; financing plan for PA system and review and demonstration of sustainable financing options enable improved PA management; Improved protection and management through development of professional competency standards, capacity building and demonstration activities, enhanced	Increased area of globally significant ecosystems included in Hainan's PA system, and receive enhanced legal protection. Threats to globally significant wetland biodiversity within protected areas are reduced. Globally significant wetland biodiversity is conserved and used sustainably within Hainan's wetland PA subsystem.

Cost/Benefit	Baseline (B)	Alternative (A)	Increment (A-B)
	inside and outside Hainan's PA system are partially protected but being degraded. Globally significant wetland biodiversity is declining inside and outside Hainan's PA system.	community co-management, awareness levels. Threats reduced through improved legal protection and enforcement, sector specific standards and inter-sectoral collaboration mechanisms established, enhanced awareness of economic values and improved information management.	Increased security for globally significant species reliant on Hainan's wetland PA subsystem such as the Black-faced Spoonbill and migratory shorebird populations
National and local benefits	Wetland ecosystem services in PAs threatened by encroachment, unsustainable uses and lack of inter-sectoral cooperation; ecotourism potential unrealized. Consumptive use values of fishing and other wetland products decline and may collapse without effective management.	Wetland ecosystem services in PAs maintained through improved integrated resource management, increased awareness of economic values of ecosystem services, and ecotourism standards and incentives. Fishing and other wetland product harvesting are regulated, community resource use conflicts managed through co-management agreements, and sustainable resource usage improved through awareness raising, alternative livelihoods and eco-compensation schemes.	Wetland ecosystem services provide sustainable flow of benefits to local communities and provincial economy, including coastal protection and fisheries maintenance. Increased tourism revenues and benefits to local communities from alternative land uses. Increased sustainability of land and resource uses provides greater security of income for local communities and consumptive uses increasingly replaced by non-consumptive uses such as ecotourism.
COSTS			
Outcome 1: Improved protection and management of Hainan's ecosystems through expansion, consolidation and strengthening of the provincial PA system	**Baseline: $30,000,000**	**Alternative: $35,530,000**	GEF: $380,000 Cofinancing: $5,150,000 **TOTAL $5,530,000**
Outcome 2: Strengthened protection, participatory management and restoration of mangrove forests through	**Baseline: $40,000,000**	**Alternative: $49,067,271**	GEF: $1,729,271 Cofinancing $7,338,000 **TOTAL $9,067,271**

Cost/Benefit	Baseline (B)	Alternative (A)	Increment (A-B)
the development of a Mangrove PA Network (MPAN)			
Outcome 3: Improved integration of wetland conservation into development and sectoral planning and practices through a strengthened PA System Management Framework	**Baseline: $30,000,000**	**Alternative: $35,057,000**	GEF: $400,000 Cofinancing $4,657,000 **TOTAL $5,057,000**
Project Management **TOTAL COSTS**	**Baseline: $100,000,000**	**Alternative: $980,500** **Alternative: $120,634,771**	GEF: $125,500 Cofinancing: $855,000 **TOTAL:** $980,500 **TOTAL $20,634,771**

SECTION III: Total Budget and Workplan

Short Title:	PIMS 4597 BD FSP CBPF-MSL-Wetland PA in Hainan
Award ID:	00069892
Project ID:	00084186
Business Unit:	CHN10
Project Title:	CBPF-MSL: Strengthening the management effectiveness of the wetland protected area system in Hainan for conservation of globally significant biodiversity
PIMS#:	4597
Implementing Partner:	Forestry Department of Hainan Province and Dongzhaigang Nature Reserve

Implementing Agent	Fund ID	Donor Name	Atlas Budgetary Acct Code	Atlas Budget Description	Amount Year 1 (USD)	Amount Year 2 (USD)	Amount Year 3 (USD)	Amount Year 4 (USD)	Amount Year 5 (USD)	Total (USD)	Budget Note
Activity 1: Expansion, consolidation and strengthening of the provincial PA system											
HFD	62000	GEF	71200	International Consultants	12,650.00	1,650.00	1,650.00	1,650.00	1,650.00	**19,250.00**	1
			71300	Local Consultants	4,900.00	6,700.00	10,700.00	2,000.00	2,000.00	**26,300.00**	2
			72100	Contractual Service Company	48,200.00	78,200.00	70,000.00	40,000.00	2,000.00	**238,400.00**	3
			71600	Travel	14,000.00	11,000.00	5,000.00	5,000.00	5,000.00	**40,000.00**	4
			74200	Audio-visual and printing production costs	10,000.00	20,000.00	5,000.00	5,000.00	5,000.00	**45,000.00**	5
			74500	Miscellaneous	210.00	210.00	210.00	210.00	210.00	**1,050.00**	6
			75700	Training, meeting, and workshop	2,000.00	2,000.00	2,000.00	2,000.00	2,000.00	**10.000.00**	7
				Total	**91,960.00**	**119,760.00**	**94,560.00**	**55,860.00**	**17,860.00**	**380,000.00**	

Activity 2: Development of a Mangrove PA Network											
HFD	62000	GEF	71200	International Consultants	35,500.00	25,000.00	21,750.00	13,500.00	13,500.00	**109,250.00**	8
			71300	Local Consultants	36,100.00	61,500.00	34,800.00	31,800.00	30,800.00	**195,000.00**	9
			71600	Travel	30,000.00	35,000.00	35,000.00	30,000.00	30,000.00	**160,000.00**	10
			72100	Contractual Services - Company	91,000.00	197,200.00	237,400.00	187,600.00	162,800.00	**876,000.00**	11
			72200	Equipment	100,000.00	60,000.00	40,000.00	10,000.00	15,000.00	**225,000.00**	12
			74200	Audio-visual and printing production costs	10,000.00	20,000.00	40,000.00	40,000.00	40,000.00	**150,000.00**	13
			74500	Miscellaneous	804.21	804.21	804.21	804.21	804.21	**4,021.00**	14
			75700	Training, meeting, and workshop	2,000.00	2,000.00	2,000.00	2,000.00	2,000.00	**10,000.00**	15
				Total	**305,404.21**	**401,504.21**	**411,754.21**	**315,704.21**	**294,904.21**	**1729,271.00**	
Activity 3: Strengthening of the PA System Management Framework											
HFD	62000	GEF	71200	International Consultants	11,000.00	11,000.00	8,250.00	5,500.00	5,500.00	**41,250.00**	16
			71300	Local Consultants	5,000.00	5,000.00	5,000.00	5,000.00	5,000.00	**25,000.00**	17
			71600	Travel	7,000.00	9,000.00	12,000.00	8,000.00	4,000.00	**40,000.00**	18
			72100	Contractual Service Company	15,000.00	70,000.00	70,000.00	60,000.00	15,000.00	**230,000.00**	19
			72800	Information Technology Equipment	0.00	20,000.00	0.00	0.00	0.00	**20,000.00**	20
			74200	Audio-visual and printing production costs	2,000.00	10,000.00	10,000.00	10,000.00	2,000.00	**34,000.00**	21
			75700	Training, meeting, and workshop	1,750.00	2,000.00	2,000.00	2,000.00	2,000.00	**9,750.00**	22
				Total	**41,750.00**	**127,000.00**	**107,250.00**	**90,500.00**	**33,500.00**	**400,000.00**	
PROJECT MANAGEMENT											
HFD	62000	GEF	71300	Local Consultants	17,000.00	17,000.00	17,000.00	17,000.00	17,000.00	**85,000.00**	23
			71600	Travel	2,000.00	2,000.00	2,000.00	2,000.00	2,000.00	**10,000.00**	24
			72200	Equipment	12,300.00	0.00	0.00	0.00	0.00	**12,300.00**	25
			74500	UNDP cost recovery charge	953.00	1,906.00	0.00	0.00	0.00	**2,859.00**	26

			74500	Miscellaneous	3,341.00	4,000.00	3,000.00	3,000.00	2,000.00	**15,341.00**	27
				Total	**35,594.00**	**24,906.00**	**22,000.00**	**22,000.00**	**21,000.00**	**125,500.00**	
					474,708.21	**673,170.21**	**635,564.21**	**484,064.21**	**367,264.21**	**2634,771.00**	

Summary of Funds						
Source	Year 1	Year 2	Year 3	Year 4	Year 5	**Total**
GEF	474,708.21	673,170.21	635,564.21	484,064.21	367,264.21	2,634,771.00
Government (cash)	2,300,000.00	3,500,000.00	3,100,000.00	2,300,000.00	1,800,000.00	13,000,000.00
Government (in kind)	780,000.00	1,110,000.00	1,028,000.00	787,000.00	595,000.00	4,300,000.00
UNDP	127,000.00	181,000.00	167,000.00	128,000.00	97,000.00	700,000.00
Total	3,681,708.21	5,464,170.21	4,930,564.21	3,699,064.21	2,859,264.21	20,634,771.00

Budget Notes

Component 1

1	CTA/Protected Area System Planning and Mainstreaming Specialist (US$2750 x 7 mw). Domestic expertise in protected area system planning is still in the early stage of development and international expertise in the mentioned areas would be critical for ensuring transformational change.
2	Project Manager / PA System Planning & Mainstreaming Specialist (US$500 x 40mw), PA Financing Specialist ($900 x 7 weeks)
3	A: Key planning and consultation meetings for: the development of a wetland PA subsystem strategy and action plan and climate change resilience plan; development of a financing plan for the PA System; sustainable financing / eco-compensation reviews and case study; and M&E for their implementation (output 1.1); development of provincial guidelines for coastal management (output 1.2) (US$62,000).
	B: Contracted services for the development of a site business plan for Dongzhaigang including demonstration of applying eco-compensation scheme payments to support site management; in-depth feasibility study of using eco-compensation schemes to enable sustainable financing of the PA system (output 1.1) (US$40,000).
	C: Contracted services for development of provincial guidelines for coastal management (output 1.2), including designing a participatory process with a series of stakeholder consultation meetings to develop the guidelines; technical guidance throughout the implementation of the participatory process through to the completion of the guidelines; technical review of existing guidelines (ACEDP project, Ramsar guidelines, etc) and regulations; capacity building inputs on wetland management, climate change mitigation and adaptation, integrated coastal zone management approaches and other subjects as necessary to ensure development of the guidelines is well informed; technical review of the final guidelines to ensure consistency with international best practices (US$36,400).
	D: Service contract for provision of capacity building services, including review and adaptation of ARCBC professional competency standards for Hainan's PA system, planning and delivery of training for PA system managers to address immediate short term needs, such as monitoring and evaluation for the PA system strategy and action plan (US$100,000).
4	Estimated travel for international and national consultants and project staff.
5	Translation, editing, design and printing of reports and awareness materials and other publications (including the PA system consolidation strategy and action plan, PAS financing plan, coastal wetland guidelines, professional competency standards, etc)
6	Contingency to cover exchange rate fluctuations.

7	Costs associated with organizing specialized meetings associated with the development of the PA system consolidation strategy and action plan, coastal wetland guidelines, professional competency standards, training, etc. (venue, catering, facilitation, interpretation etc.).
Component 2	
8	CTA / PA System Planning & Mainstreaming Specialist (US$2750 x 15mw), Wetland Management Planning Specialist (US$2750 x 15mw), EHI Monitoring Specialist (US$2750 x 9.73mw)
9	Project Manager / PA System Planning & Mainstreaming Specialist (US$500 x 130mw), Communications Education & Awareness Specialist (US$250 x 260mw), Mangrove PA Network Coordinator (US$250 x 260mw)
10	Estimated travel costs for international, national consultants and project staff.
11	A: Key planning and consultation meetings for: development and integration of the Mangrove PA Network (MPAN) into provincial PA system planning and operations, and applying sectoral standards to address management issues at MPAN sites (Output 2.1), management plans and buffer zone development (2.4), wetland PA protection (2.5) and community co-management coordination (2.6) (US$46,000)
	B: Service contract for provision of capacity building services for MPAN sites, including review and adaptation of ARCBC professional competency standards at site level ($20,000), identification of training needs and developing a training action plan ($20,000), and delivery of training in a range of subjects to address identified needs. Priority training subjects are likely to include: law enforcement, conflict management, visitor management, environmental monitoring (a range of EHI parameters), tourism control, extension work, monitoring and control of alien invasive species, mangrove restoration, etc. ($150,000); and M&E for training activities ($10,000) (Output 2.2); this will also include development of institutional linkages for applied research and continuing professional development through a mangrove research working group under Output 2.3 (total of US$200,000)
	C: Service contract for technical assistance in development of nature reserve buffer zones, and the detailed technical feasibility assessment, planning and supervision of mangrove reforestation for 1,000 ha at MPAN demonstration sites - Dongzhaigang, Qinglangang, Dongfang and Sanya (Output 2.4) (US$50,000) Note - most of the work involved for these activities will be supported by HFD cofinancing.
	D: Service contract for the detailed planning and development of co-management schemes at Dongzhaigang and Qinglangang, including design and facilitation of participatory processes and establishment of platforms for collaboration (local stakeholder committees) ($50,000), extensive capacity building on community co-management processes and related skills ($50,000); participatory review and identification of alternative livelihoods activities ($20,000); provision of capacity building in ecotourism development subjects (visitor services including guiding, transport and accommodation) in relation to adapted ASEAN standards ($90,000); and sustainable aquaculture /fisheries practices in line with established standards; other appropriate sustainable livelihood development (US$90,000).
	E: Service contract for market research, analysis and development of social marketing campaign plan to deliver key messages to selected target groups in Hainan Province (e.g. decision makers in provincial & local govt, planners, media, key sectors) on the value of wetland ecosystem services and biodiversity and the socio-economic consequences of their loss (informed by Output 3.3) ($90,000); preparation and dissemination of related communication materials targeting specific audiences in electronic and hard copy formats (US$48,000).
	F: Monitoring and evaluation costs (see Project document Table 11 and CEO Endorsement Section H for details), Including: Contracted services for Mid term and Terminal Evaluations including: International Project Evaluators, National Project Evaluators and associated travel for evaluators (total $80,000); specific studies and monitoring associated with MoV for project indicators ($15,000); annual project audit ($22,000); Production, translation and printing of a project completion report in popular full colour format, documenting key project achievements, best practices and lessons learned ($15,000); costs associated with inception meeting planning and reporting ($10,000)

12	Equipment costs from GEF sources in support of Mangrove PA Network sites management and related project coordination needs. Discussions with local government have enabled co-funding to be used to cover the bulk of equipment and vehicle costs under government co-financing. GEF will cover only needs of PMO and consultants plus specific capacity building needs for PAs including site monitoring equipment (binoculars, telescopes, digital cameras, GPS units, vegetation and water quality monitoring equipment, etc), computers and peripherals, communications equipment, etc. ($185,000). A 4WD vehicle ($40,000) is required for coordination and implementation of demonstration site activities including mangrove replanting work .
13	Translation, editing, design and printing of reports and awareness materials developed under component 2. Note that this component carries the majority of communications and awareness work on behalf of the project (Output 2.7)
14	Contingency to cover exchange rate fluctuations.
15	Costs associated with organizing specialized meetings related to MPAN related activities including management planning, co-management development, buffer zone development, mangrove replanting programmes, capacity building, etc (venue, catering, facilitation, printing, interpretation etc.).
Component 3	
16	PA System Planning & Mainstreaming Specialist (US$2750 x 15 mw)
17	Project Manager / PA System Planning & Mainstreaming Specialist (US$500 x 50mw)
18	Estimated travel costs for international and national consultants and project staff.
19	A: Service contract to design and support a stakeholder consultation process for the development of tourism standards in line with international standards (eg ASEAN) ($20,000) and guidelines for sustainable fisheries and aquaculture ($20,000); provision of sector-related capacity building in ecotourism and sustainable fishery subjects to facilitate the operationalization of sectoral standards (3.2) ($40,000), as well as building capacity for intersectoral coordination including SEA and EIA procedures (US$15,000).
	B: Service contract for provision of economic valuation services (3.3), specifically the quantification of economic values for key mangrove ecosystem services including coastal protection, fisheries production, and regulating services through scientific assessments at Dongzhaigang ($70,000), plus province wide assessment of the value of coastal protection ecosystem services ($20,000) & publication of a synthesis of results (US$10,000)
	C: Service contract for the development of a GIS database for the wetland PA subsystem containing PA and biodiversity information and its adaptation for web access, linked to the national platform under the CBPF MSL Programme; routine monitoring and reporting procedures from the demonstration sites to the provincial level PA database ; hardware and software will be put into place, and training, network, data flows, data sharing protocols and data reporting forms necessary to operationalise the database; monitoring guidelines booklet (US$35,000).
20	High specification computer, database and GIS software, and peripherals for information management system
21	Translation, editing, designing and printing of reports and awareness materials, relating to tourism and fishery sector standards and guidelines, economic valuation synthesis report and other economic outputs, products related to the PA & BD information management system
22	Contingency for exchange rate fluctuations and small costs associated with organizing specialized stakeholder engagement meetings and hosting issue-based stakeholder meetings (venue, catering, facilitation, printing, interpretation, etc.) related to inter-sectoral coordination for the PA system, development of sectoral standards, economic valuation activities, and development of the PA & BD information system.
Project Management Costs	
23	Project management supports Project Manager (US$500 x 40mw) and Project Assistant (US$250 x 260mw)
24	Travel associated with project management
25	Project management equipment (computers and other office equipment) for PCU

26	Estimated UNDP Direct Project Service/Cost recovery charges for international consultant recruitment services and equipment procurement requested by the HFD to UNDP for executing services as indicated in the Agreement in Annex 8 of the Project Document. In accordance with GEF Council requirements, the costs of these services will be part of the executing entity's Project Management Cost allocation identified in the project budget In accordance with GEF Council requirements, the costs of these services will be part of the executing entity's Project Management Cost allocation identified in the project budget. DPS costs would be charged at the end of each year based on the UNDP Universal Pricelist (UPL) or the actual corresponding service cost. The amounts here are estimations based on the services indicated, however as part of annual project operational planning the DPS to be requested during the calendar year would be defined and the amount included in the yearly project management budgets and would be charged based on actual services provided at the end of that year. Estimated amount: US$ 2,859 (US$953 X 3 international recruitments) – See more details in Annex 8 : Letter of Agreement for UNDP Direct Project Services LOA.
27	PCU operational communications costs (email, internet, telephones).

SECTION IV: ADDITIONAL INFORMATION

PART I: Other agreements

CO-FINANCING LETTERS

-- *See also separate file*— Hainan Co-financing Commitment Letter

海南省财政厅

琼财债函〔2013〕61号

海南省财政厅关于全球环境基金增强海南湿地保护地体系的有效管理促进全球重要生物多样性保护项目配套资金的承诺函

联合国开发计划署驻华代表处：

为确保全球环境基金增强海南湿地保护地体系的有效管理促进全球重要生物多样性保护项目顺利实施，我厅承诺为该项目提供项目地方配套资金1,730万美元，折合人民币10,777.9元（按2012年12月汇率6.23），其中，现金配套1,300万美元，实物配套430万美元。

特此承诺。

海南省财政厅

2013年1月18日

（此件依申请公开）

海南省财政厅

Yan nick Glemarec
GEF Executive Coordinator
United Nations Development Programme
One United Nations Plaza
New York, NY 10017
U.S.A.

Subject: Counterpart Fund Commitment Letter of CBPF- MSL: Strengthening the Management Effectiveness of the Wetland Protected Area System in Hainan forConservation of Globally Significant Biodiversity

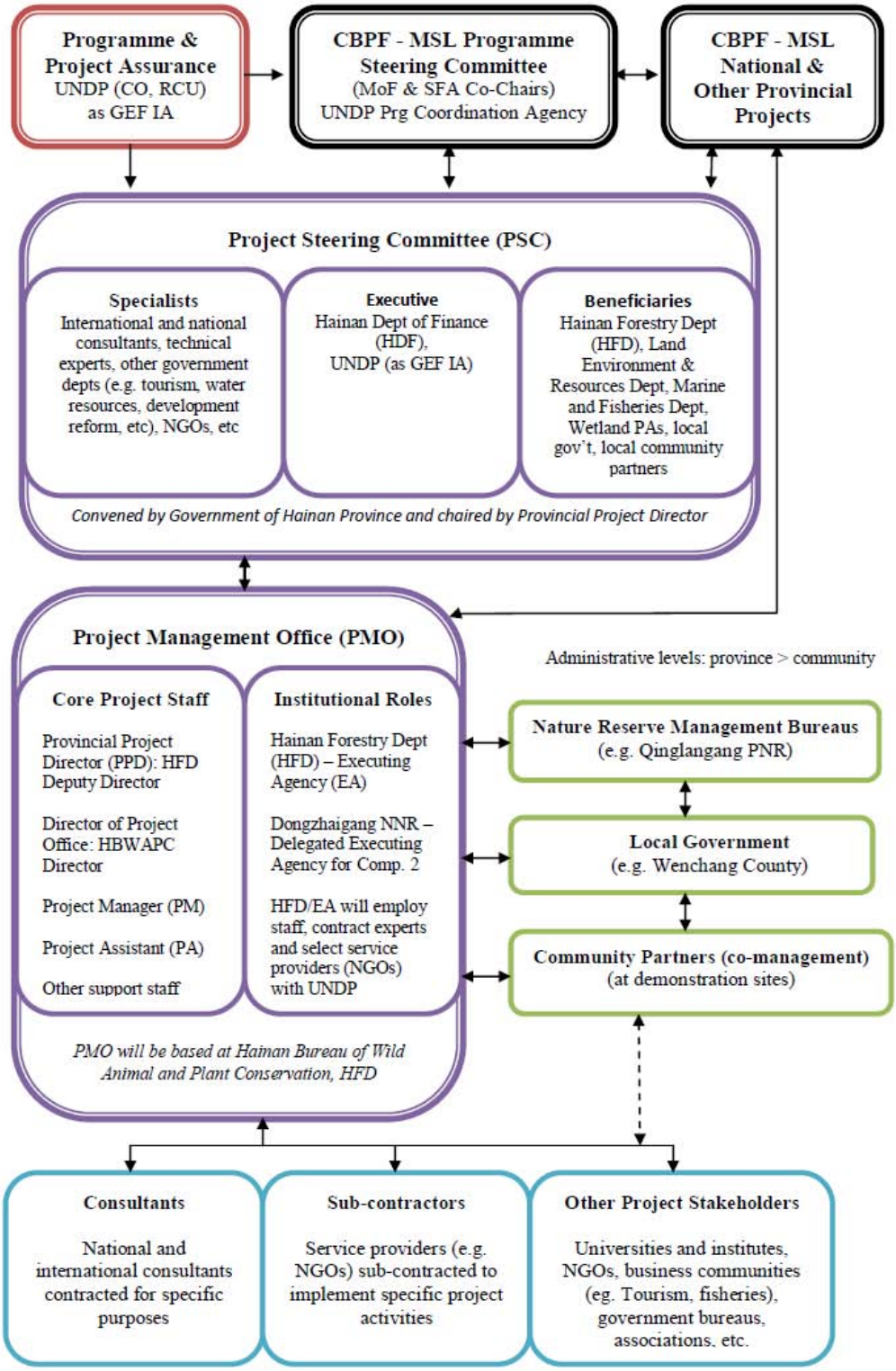
Dear Mr. Glamarec,

We are delighted to submit the CEO Endorsement Request and Project Document for the project CBPF-MSL: Strengthening the Management Effectiveness of the Wetland Protected Area System in Hainan for Conservation of Globally Significant Biodiversity. Hainan Provincial Department of Finance Province hereof cordially consents to the local counterpart fund USD 17.3 million, of which USD 13 million will be supplied in cash and USD 4.3 million will be provided in kind, to secure the implementation of the project.

We would like to take this opportunity to express our sincere appreciation to UNDP for your great support to this project.

Hainan Provincial Department of Finance

PART II: Organogram of Project



PART III: Terms of Reference for key project staff

PROJECT MANAGER[70]

Background

The Project Manager (PM), will be a locally recruited national selected based on an open competitive process. He/She will be responsible for the overall management of the project, including the mobilization of all project inputs, supervision over project staff, consultants and sub-contractors. The PM will report to the UNDP CO in close consultation with the host institution for all of the project's substantive and administrative issues. From the strategic point of view of the project, the PM will report on a periodic basis to the Project Steering Committee (PSC). Generally, the PM will be responsible for meeting government obligations under the project, under the national execution modality (NEX). He/She will perform a liaison role with the Government, UNDP and other UN Agencies, NGOs and project partners, and maintain close collaboration with other donor agencies providing co-financing.

Duties and Responsibilities

- Supervise and coordinate the production of project outputs, as per the project document;
- Mobilize all project inputs in accordance with UNDP procedures for nationally executed projects;
- Prepare TORs for contractors or subcontractors and ensure contractors' deliverables;
- Supervise and coordinate the work of all project staff, consultants and sub-contractors;
- Coordinate the recruitment and selection of project personnel;
- Prepare and revise project work and financial plans, as required by HFD and UNDP;
- Coordinate and oversee implementation of the project's monitoring and evaluation plan;
- Liaise with UNDP, HFD, relevant government agencies, and all project partners, including donor organizations and NGOs for effective coordination of all project activities;
- Facilitate administrative backstopping to subcontractors and training activities supported by the Project;
- Oversee and ensure timely submission of the Inception Report, Combined Project Implementation Review/Annual Project Report (PIR/APR), Technical reports, quarterly financial reports, and other reports as may be required by UNDP, GEF, SFA and other oversight agencies;
- Disseminate project reports and respond to queries from concerned stakeholders;
- Report progress of project to the steering committees, and ensure the fulfilment of steering committees directives.
- Oversee the exchange and sharing of experiences and lessons learned with relevant integrated conservation and development projects nationally and internationally;
- Ensure the timely and effective implementation of all components of the project;
- Oversee implementation of the stakeholder participation plan and assist community groups, municipalities, NGOs, staff, students and others with development of essential skills through training workshops and on the job training thereby upgrading their institutional capabilities;

[70] It is anticipated that this position will also provide technical inputs as the PA System Planning and Mainstreaming Specialist

- Coordinate and assists scientific institutions with the initiation and implementation of all field studies and monitoring components of the project
- Assist and advise the teams responsible for communications and awareness raising ; and
- Carry out regular, announced and unannounced inspections of all sites and the activities of the project site management units.
- Ensure that UNDP Environmental and Social Screening Procedure safeguards are applied to project implementation.

Qualifications

- A university degree (MS or PhD) in a subject related to natural resource management or environmental sciences;
- At least 10 years of experience in natural resource management (preferably in the context of PA planning and management);
- At least 5 years of project/programme management experience;
- Working experience with ministries, national or provincial institutions concerned with natural resource management and environmental protection is a plus, but not a requirement;
- Ability to effectively coordinate a large, multi-stakeholder project;
- Ability to administer budgets, train and work effectively with counterpart staff at all levels and with all groups involved in the project;
- Strong drafting, presentation and reporting skills;
- Strong computer skills, in particular mastery of all applications of the MS Office package and internet search;
- Strong knowledge about the political and socio-economic context related to the protected area system, biodiversity conservation and wetlands management at national, provincial and municipal levels;
- Excellent writing communication skills in Chinese; and
- A good working knowledge of English is a requirement.

PROJECT ASSISTANT

Background

The Project Assistant will be locally recruited based on an open competitive process. He/She will be responsible for the overall administration of the project. The Project Assistant will report to the Project Manager. Generally, the Project Assistant will be responsible for supporting the Project Manager in meeting government obligations under the project, under the national execution modality (NEX).

Duties and Responsibilities

- Collect, register and maintain all information on project activities;
- Contribute to the preparation and implementation of progress reports;
- Monitor project activities, budgets and financial expenditures;
- Advise all project counterparts on applicable administrative procedures and ensure their proper implementation;
- Maintain project correspondence and communication;
- Support the preparations of project work-plans and operational and financial planning processes;
- Assist in procurement and recruitment processes;
- Assist in the preparation of payments requests for operational expenses, salaries, insurance, etc. against project budgets and work plans;
- Follow-up on timely disbursements by UNDP CO;
- Receive, screen and distribute correspondence and attach necessary background information;
- Prepare routine correspondence and memoranda for Project Manager's signature;
- Assist in logistical organization of meetings, training and workshops;
- Prepare agendas and arrange field visits, appointments and meetings both internal and external related to the project activities and write minutes from the meetings;
- Maintain project filing system;
- Maintain records over project equipment inventory; and
- Perform other duties as required.

Qualifications

- A post-school qualification (college diploma, or equivalent);
- At least 5 years of administrative and/or financial management experience;
- Demonstrable ability to administer project budgets, and track financial expenditure;
- Demonstrable ability to maintain effective communications with different stakeholders, and arrange stakeholder meetings and/or workshops;
- Excellent computer skills, in particular mastery of all MS Office programmes;
- Excellent written communication skills; and

- A good working knowledge of English and Chinese.

CHIEF TECHNICAL ADVISOR[71]

Background

The Chief Technical Advisor (CTA) will be responsible for providing overall technical backstopping to the Project. He/She will render technical support to the Project Director, Project Manager, PA agency staff and other government counterparts. The CTA will coordinate the provision of the required technical inputs, review and preparation of Terms of Reference, and provision of technical support to assure the outputs of consultants and other sub-contractors meet expected standards. The CTA will be an experienced expatriate. He/She will report directly to the Project Director.

Duties and Responsibilities

- Provide technical and strategic assistance to the Project Director, Project Manager and other counterparts in areas of project management and planning, in particular the development of biennial work plans, monitoring progress, providing quality assurance for outputs, and ensuring that annual, mid-term and end-of-project targets will be met;
- Bring international experiences to project planning and implementation to ensure that full use is made of global and national lessons learned, and that best practices are used to achieve the project goal of enhancing the effectiveness of the PA system to protect biodiversity;
- Support the Project Manager in preparing Terms of Reference for consultants and sub-contractors, and provide assistance in the selection process;
- Support the Project Manager in coordinating the work of all consultants and sub-contractors, ensuring timely and quality delivery of expected outputs, effective synergy among the various sub-contracted activities, and integration of project outputs into Government work;
- Provide technical support for management of site activities, monitoring, and impact assessment, as well as technical support in the areas of biodiversity conservation strategic planning, protected area planning and collaborative management;
- Assist and advise the Hainan Forestry Department in key strategic and policy issues related to biodiversity, protected areas, institutional strengthening processes, and appropriate monitoring and evaluation systems and knowledge management systems;
- Assist the Project Director and Project Manager with technical input in preparation of the inception report, Combined Project Implementation Review / Annual Project Report, and technical reports for submission to UNDP, the GEF, other donors and the Government, as required;
- Assist the Project Director and Project Manager in mobilizing staff and consultants in the conduct of a mid-term project evaluation, and in undertaking revisions in the implementation programme and strategy, based on evaluation results;

[71] This will be a shared position between several CBPF MSL Programme projects (details to be confirmed). Inputs to this project are covered as international PA System Planning and Mainstreaming Specialist through the technical assistance portion of the budget.

- Provide capacity building support to Hainan Forestry Department staff and PA managers;
- Assist the Project Director and Project Manager in liaison work with project partners, donor organizations, NGOs and other groups to ensure effective coordination of project activities, and coordination with CBPF MSL Programme, national and provincial project managers, as well as local, national and international complementary projects and programmes;
- Support the Project Manager in documenting lessons learned through implementation of the project and assist in making recommendations to the Project Steering Committee for more effective implementation and coordination of project activities;
- Produce policy briefing papers and technical reports to support decision-making processes, advocacy and knowledge management; and
- Perform other tasks as may be requested by the Project Director and Project Manager.

Qualifications

- University education (MS or PhD) with expertise in the area of PA and conservation planning and management, wetland / coastal resource management or environmental management;
- At least 15 years of professional experience in conservation planning and management and proven ability to work with multiple stakeholders;
- Demonstrable experience in the implementation of multilateral donor funded or government funded international development projects, with strong skills in monitoring and evaluation;
- Demonstrable experience in project organization and ability to serve as effective negotiator with excellent oral presentation skills;
- Good knowledge of international best practice in PA planning and management, and conservation in general, is desirable;
- Previous experience with GEF projects is an advantage;
- Ability to effectively coordinate a large, multidisciplinary team of experts and consultants;
- Be an effective negotiator with excellent oral and presentation skills;
- Excellent written communication skills including the ability to prepare clear technical and management reports;
- Fluency in English is required and a good working knowledge of Chinese is highly desirable.

OVERVIEW OF INPUTS FROM TECHNICAL ASSISTANCE CONSULTANTS[72]

TABLE 13. OVERVIEW OF INPUTS FROM TECHNICAL ASSISTANCE CONSULTANTS

Consultant	$/ Person Week	Person Week	Tasks and Inputs
For Project Management / Monitoring & Evaluation			
Local / National contracting			
Project Manager[73]	500	40	The Project Manager is responsible for overall coordination of the project activities and timely and quality delivery of project outputs. S/he will: ▪ Supervise and coordinate the production of project outputs, as per the project document; ▪ Mobilize all project inputs in accordance with UNDP procedures for nationally executed projects; ▪ Supervise and coordinate the work of all project staff, consultants and sub-contractors; ▪ Coordinate the recruitment and selection of project personnel; ▪ Prepare and revise project work and financial plans, as required by UNDP; ▪ Liaise with UNDP, relevant government agencies, and all project partners, including donor organizations and NGOs for effective coordination of all project activities; ▪ Facilitate administrative backstopping to subcontractors and training activities supported by the Project; ▪ Oversee and ensure timely submission of the Inception Report, Combined Project Implementation Review/Annual Project Report (PIR/APR), Technical reports, quarterly financial reports, and other reports as may be required by UNDP, GEF, SFA and other oversight agencies; ▪ Disseminate project reports and respond to queries from concerned stakeholders; ▪ Report progress of project to the steering committees, and ensure the fulfillment of Project Steering Committee directives. ▪ Oversee the exchange and sharing of experiences and lessons learned with relevant community based integrated conservation and development projects nationally and internationally; ▪ Ensures the timely and effective implementation of all components of the project; ▪ Assist community groups, townships, NGOs, staff, students and others with development of essential skills through training workshops and on the job training thereby upgrading their institutional capabilities; ▪ Coordinate and assists scientific institutions with the initiation and implementation of all field studies and monitoring components of the project ▪ Ensure good communication on project results and lessons, liaising with media and stakeholders. ▪ Carry regular, announced and unannounced inspections of all sites and the activities of any project site management units.

[72] The exact TOR and timing of consultancies will be reviewed at Project Inception and on an annual basis in preparation of annual workplans. TOR for different consultancy inputs are given above for the relevant outputs in section Part One – Section II Strategy. Some activities could be combined for efficient contracting purposes.

[73] The Project Manager will also provide significant technical inputs to all components as national PA System Planning and Mainstreaming Specialist

Consultant	$/ Person Week	Person Week	Tasks and Inputs
Project Assistant	250	260	Project Assistant will be responsible for overall administration of the project. S/he will: ▪ Collect, register and maintain all information on project activities; ▪ Contribute to the preparation and implementation of progress reports; ▪ Monitor project activities, budgets and financial expenditures; ▪ Advise all project counterparts on applicable administrative procedures and ensure their proper implementation; ▪ Maintain project correspondence and communication; ▪ Support the preparations of project work-plans and operational and financial planning processes; ▪ Assist in procurement and recruitment processes; ▪ Assist in the preparation of payments requests for operational expenses, salaries, insurance, etc. against project budgets and work plans; ▪ Follow-up on timely disbursements by UNDP CO; ▪ Receive, screen and distribute correspondence and attach necessary background information; ▪ Prepare routine correspondence and memoranda for Project Managers signature; ▪ Assist in logistical organization of meetings, training and workshops; ▪ Prepare agendas and arrange field visits, appointments and meetings both internal and external related to the project activities and write minutes from the meetings; ▪ Maintain project filing system ▪ Maintain records over project equipment inventory; and ▪ Perform other duties as required.
For Technical Assistance			
Outcome 1			
Local / National contracting			
PA System Planning & Mainstreaming Specialist (Also Project Manager)	500	40	**Output 1.1 PA system consolidation, expansion and financing** ▪ Coordinate the development of a strategic plan for the wetland PA subsystem incorporating climate change adaptation and catchment management concerns; ▪ Coordinate the development of a financing plan for the consolidated PA system and mangrove PA subsystem including sustainable financing reviews, case studies and recommendations ▪ Provide technical support for implementation of the wetland PA system and financing plans **Output 1.3 Strengthened PA system supervisory capacity** ▪ Coordinate the development of professional competence standards required for PA System management and related contracted services on capacity needs assessment and provision of a range of training inputs
PA Financing Specialist	900	7	**Output 1.1 PA system consolidation and expansion** Working closely with the international PA system planning and mainstreaming specialist: ▪ Based on the PA system plan, management plans and institution development plans, develop a realistic costing for managing Hainan's PA system; ▪ Develop a financing plan for the consolidated PA system and mangrove PA subsystem ▪ Analyse the current revenue streams for the Hainan PA system and take into consideration potential revenue streams from innovative revenue generating mechanisms such as eco-compensation schemes and fee payment schemes;

Consultant	$/ Person Week	Person Week	Tasks and Inputs
			▪ Provide technical guidance and input to development of a demonstration eco-compensation scheme and business plan for Dongzhaigang.
International / Regional and global contracting			
PA System Planning & Mainstreaming Specialist (Also CTA) US$2750/week	2750	7	Working closely with the Project Director and Project Manager and Assistant the specialist will provide part-time but continuous technical support for outputs under Outcomes 1-3 for the duration of the project period. Tasks will entail: ▪ Assist the HFD through the institutional strengthening process to ensure that adequate human and financial resources are secured for effective biodiversity conservation outcomes and effective park management; ▪ Ensure that the HFD institutes effective and sustainable biodiversity monitoring and evaluation mechanisms at both local and national levels, including knowledge management system establishment, support for PA system planning and park management planning; ▪ Provide capacity building support to HFD staff and PA managers; ▪ Bring in international experiences to ensure that the project will operate making full use of global experiences, good practices and lessons learned in improving PA management effectiveness; ▪ Produce policy briefing papers and project technical reports for supporting decision making processes, advocacy and knowledge management as appropriate; ▪ Be responsible for ensuring a sound conservation basis for project intervention and intended biodiversity conservation outcomes of the project; ▪ Support preparation of ToR and development of methodology in the execution of various technical studies to be carried out through the project, as well as assuring quality of technical reports compiled by consultants and links with project outputs and outcomes; ▪ Provide technical inputs to the Inception Report, Project Implementation Review, and technical reports for submission to UNDP, the GEF, other donors and Government Departments, as required. **Specific technical inputs required for Component 1 are as follows**: **Output 1.1 PA system consolidation and expansion** ▪ Advise the HFD in key strategic and policy issues related to biodiversity conservation strategy and protected area planning and facilitate development of a strategic plan for the mangrove PA subsystem; ▪ Advise the HFD regarding the development of a financing plan for the consolidated PA system and mangrove PA subsystem; ▪ Provide technical advice and support for sustainable financing for the PA system including development of a demonstration eco-compensation scheme and business plan for Dongzhaigang; ▪ Provide technical support for implementation of PA system plans and financing plans **Output 1.3 Strengthened PA system supervisory capacity** ▪ Provide guidance to HFD and related agencies on professional competence standards required for PA System management and input to capacity needs assessment and international aspects of training delivery.
Outcome 2			
Local / National contracting			
PA System Planning & Mainstreaming Specialist	500	130	**Output 2.1 Mangrove PA Network established and recognized in PA system plans** ▪ Integrate the Mangrove PA Network (MPAN) into PA System consolidated planning and financing as the mangrove subsystem component ▪ Oversee MPAN capacity building, demonstration activities and contracted

Consultant	$/ Person Week	Person Week	Tasks and Inputs
(Also Project Manager)			services ▪ Facilitate the establishment of external linkages between the MPAN sites and centres of technical expertise, related projects and programmes, and sectors ▪ Liaise with MPAN managers, sectoral agencies and technical specialists to apply sector specific standards and safeguards to the Mangrove PA Network sites in order to reduce threats **Output 2.2 Professional competency standards applied to staff of Mangrove PA Network Sites** ▪ Oversee the development of professional competence standards required for the management of MPAN sites and the provision of contracted inputs to capacity needs assessment and international aspects of training delivery. **Output 2.3 Ecosystem Health Index monitoring introduced for Mangrove PA Network sites, supported by applied research** ▪ Ensure that EHI monitoring results are used effectively for project M&E and results based management ▪ Evaluate EHI as a monitoring tool and make recommendations to upscale the approach for use throughout Hainan's PA system as appropriate **Output 2.4 Improved management planning and strengthened buffer zones through mangrove protection and restoration for demonstration Mangrove PA Network sites** ▪ Liaise with HFD and other agencies to ensure that management plan development processes and formats are consistent with HFD and PA system requirements **Output 2.5 Protection status of mangrove PAs strengthened through network** ▪ Liaise with HFD regarding detailed requirements for the upgrading of protection status for Sanya NR and oversee implementation ▪ Liaise with HFD, SFA, Wenchang County Government and other stakeholders regarding detailed requirements for designation of Qinglangang as a Ramsar Site and oversee related consultation and awareness-raising measures **Output 2.7 Increased awareness of the values of mangrove PAs supports conservation** ▪ Work with service providers to design a social marketing campaign aiming to mainstream the PA system into the 13th Five Year Plan for Hainan Province ▪ Oversee the production of communications products and implementation of the social marketing campaign, targeting appropriate audiences across a range of sectors ▪ Provide inputs to the social marketing campaign, including written materials on the PA system and mainstreaming and participation in related meetings and events
Communications, Education & Awareness Specialist	250	260	**Output 2.7 Increased awareness of the values of mangrove PAs supports conservation** The specialist will work with a wide range of project staff, stakeholders and contractors to ensure that the project has a major impact on awareness levels at the demonstration sites and across a wide range of sectors and other target audiences in Hainan Province. Key inputs will include: ▪ Monitoring of awareness levels in relation to baselines established during project preparation ▪ Baseline surveys and monitoring to determine the effectiveness of targeted awareness measures for specific audiences on specific issues, including women and minorities ▪ Preparation of the project's communication and awareness strategy ▪ Engaging key groups including the media, enforcement agencies and judiciary ▪ Uploading news on Hainan's Mangrove PA Network, project activities and

Consultant	$/ Person Week	Person Week	Tasks and Inputs
			documents on to a project website/webpages ▪ Working with Mangrove PA managers to design, plan and deliver targeted awareness programmes to address specific mangrove management issues (e.g. electro-fishing, duck farming, pollution and litter, etc.), to support co-management efforts, and to support mangrove restoration activities ▪ Working with contracted service providers to design and implement a social marketing campaign aiming to raise awareness of the economic values of mangrove ecosystem services, targeting appropriate audiences across a range of sectors ▪ Logging information and reporting on awareness activities
Mangrove PA Network Coordinator	250	260	**Output 2.1 Mangrove PA Network established and recognized in PA system plans** This specialist will work closely with the Project Manager, CTA, mangrove PA managers and staff, and a wide range of consultants and external experts and local stakeholders to develop and build the capacity of the Mangrove PA Network and support the implementation of activities at the demonstration sites. Key inputs include: ▪ Develop the institutional basis for coordination of the mangrove PA network at Dongzhaigang NNR ▪ Develop the training base at Dongzhaigang for delivery of capacity building for the mangrove PA network staff ▪ Coordinate the planning and delivery of capacity building, demonstration activities and contracted services with mangrove PA Network site managers ▪ Develop the basis for information sharing, staff exchanges and collaborative activities in order to strengthen the mangrove PA network ▪ Develop and promote external linkages between the MPAN sites and centres of technical expertise, related projects and programmes, and sectors in order to strengthen collaborative applied research and management programmes ▪ Work with MPAN managers, sectoral agencies and technical specialists to apply sector specific standards and safeguards to the Mangrove PA Network sites in order to reduce threats ▪ Monitor and report on the development of the Mangrove PA Network, and promote its extension and replication both on Hainan island and at mangrove reserves in mainland China building on existing research networks
International / Regional and global contracting			
PA System Planning & Mainstreaming Specialist (Also CTA)	2750	15	**Output 2.1 Mangrove PA Network established and recognized in PA system plans** ▪ Design and integrate the Mangrove PA Network (MPAN) into PA System consolidated planning and financing as mangrove subsystem component ▪ Facilitate the establishment of external linkages between the MPAN sites and centres of technical expertise, related projects and programmes, and sectors ▪ Provide technical support for applying sector specific standards and safeguards to the Mangrove PA Network sites in order to reduce threats **Output 2.2 Professional competency standards applied to staff of Mangrove PA Network Sites** ▪ Provide guidance to HFD and related agencies on professional competence standards required for the management of MPAN sites and input to capacity needs assessment and international aspects of training delivery. **Output 2.3 Ecosystem Health Index monitoring introduced for Mangrove PA Network sites, supported by applied research** ▪ Provide oversight of EHI monitoring for the MPAN sites together with PM, ensuring that results are used effectively for project M&E and results based management.

Consultant	$/ Person Week	Person Week	Tasks and Inputs
			Output 2.4 Improved management planning and strengthened buffer zones through mangrove protection and restoration for demonstration Mangrove PA Network sites ▪ Provide technical assistance to HFD in meeting UNDP Environmental and Social Safeguard requirements related to mangrove restoration, including site-specific assessments and mitigation measures, as necessary. **Output 2.5 Protection status of mangrove PAs strengthened through network** ▪ Provide strategic and technical advice to HFD on strengthening the legal protection and improvement of enforcement for mangrove PAs through the MPAN ▪ Provide technical assistance to HFD in meeting UNDP Environmental and Social Safeguard requirements related to strengthened legal protection at sites planned for establishment, expansion and upgrading, including site-specific assessments and mitigation measures, as necessary.
Wetland Management Planning Specialist	2750	15	Working closely with the national coastal wetland management specialist, the international specialist will provide the following support: **Output 2.4 Improved management planning and strengthened buffer zones through mangrove protection and restoration for demonstration Mangrove PA Network sites** ▪ Review existing mechanisms for applying site management plans into SFA/HFD operational procedures and budgeting and recommend potential improvements ▪ Provide technical guidance on the design of a participatory process for the development of site management plans in line with international best practice ▪ Provide technical guidance and assistance during the preparation of model site management plans for Dongzhaigang NNR, Qinglangang PNR and other demonstration sites as required ▪ Ensure that monitoring is integrated into the management plans, including the project's EHI monitoring system and other monitoring related to the project's M&E requirements. ▪ Provide technical review of the final model site management plans to ensure consistency with international standards ▪ Provide technical support for the review and rationalization of model buffer zones for Dongzhaigang and Qinglangang ▪ Provide technical guidance for mangrove restoration efforts at MPAN sites as needed
Ecosystem Health Index Specialist	2750	9.73	Working closely with the Project Manager, Wetland Management Planning Specialist, MPAN Coordinator and others, the EHI Specialist will: ▪ Provide capacity building support to site staff and HFD PA system coordinators on EHI monitoring and reporting procedures; ▪ Provide technical assistance towards establishing EHI monitoring protocols and baselines for all MPAN sites.
Outcome 3			
Local / National contracting			
PA System Planning & Mainstreaming Specialist (Also Project Manager)	500	50	**Output 3.1 Capacity building to strengthen inter-sectoral coordination and mainstreaming PA system objectives into provincial development and sectoral planning processes** ▪ Provide technical assistance to the HFD, HLERD and HMFD in key strategic and policy issues related to biodiversity conservation strategy and protected area planning; ▪ Facilitate the development of inter-sectoral coordination and planning mechanisms and integration of the PA systems and objectives into development

Consultant	$/ Person Week	Person Week	Tasks and Inputs
			and sectoral planning process; ▪ Mainstream the PA system in the provincial planning processes; ▪ Provide support for targeted communication activities fostering inter-sectoral collaboration **Output 3.2 Sector specific standards and safeguards developed to protect wetland PAs** Working closely with the International PA & biodiversity mainstreaming specialist, and through full consultation with sector agencies and stakeholders: ▪ Coordinate review of national and provincial EIA/SEA regulations and procedures, and related capacity building support. ▪ Liaise with tourism and fisheries experts to develop environmental regulations related to tourism, aquaculture and fisheries, including development of specific standards and measures to safeguard biodiversity within NRs; ▪ Develop biodiversity safeguarding measures in tourism, aquaculture and fisheries development in provincial planning and management frameworks.
International / Regional and global contracting			
PA System Planning & Mainstreaming Specialist (Also CTA)	2750	15	The Consultant will play a key role in guiding and facilitating the implementation of Component 3, especially on intersectoral cooperation and mainstreaming of the PA System into provincial planning and procedures. Working closely with the national consultant on PA System Planning and Mainstreaming, he will: **Output 3.1 Capacity building to strengthen inter-sectoral coordination and mainstreaming PA system objectives into provincial development and sectoral planning processes** ▪ Advise the HFD, HLERD and HMFD in key strategic and policy issues related to biodiversity conservation strategy and protected area planning; ▪ Support the HFD, HLERD and HMFD in development of inter-sectoral coordination and planning mechanisms and integration of the PA systems and objectives into development and sectoral planning process; ▪ Mainstream the PA system in the provincial planning processes; ▪ Support for targeted communication activities fostering inter-sectoral collaboration **Output 3.2 Sector specific standards and safeguards developed to protect wetland PAs** Working closely with the national PA & biodiversity mainstreaming specialist, and through full consultation with sector agencies and stakeholders: ▪ Review national and provincial EIA/SEA regulations and procedures, and provide capacity building support to HFD on EIA and SEA; ▪ Work with tourism and fisheries experts to develop environmental regulations related to tourism, aquaculture and fisheries, including development of specific standards and measures to safeguard biodiversity within NRs; ▪ Develop biodiversity safeguarding measures in tourism, aquaculture and fisheries development in provincial planning and management frameworks. **Output 3.3 Awareness raised of the economic value of mangrove wetland ecosystem services** ▪ Assist HFD on contracting for economic valuation studies and compilation of a synthesis on the economic values of the mangrove wetland PA sub-system; **Output 3.4. Online database for Hainan wetland PA and biodiversity information**

Consultant	$/ Person Week	Person Week	Tasks and Inputs
			▪ Working with the service providers, ensure the establishment of an online wetland biodiversity database, supported by inter-agency agreements, data sharing protocols and biodiversity monitoring guidelines and procedures. ▪ Facilitate the harmonization and linkage of the Hainan wetland PA and biodiversity database with the national database planned under the CBPF MSL programme.

PART IV: Stakeholder Involvement Plan

Information dissemination and consultation during the PPG

280. The PPG phase included consultations with the project's key stakeholders at the national, provincial and local levels. Field trips were carried out to Hainan Province, where all the project demonstration sites were visited. All related government institutions were consulted during project development, as were research and academic institutions and NGO's. Local authorities, and community organisations were consulted during field visits and at other times during the development of the project proposal, including gender issues. Several stakeholder consultation meetings were convened at the provincial level, including presentation and review of project activities in the draft project document. In addition, several bilateral meetings were held, mostly with donors and key stakeholders who could not attend the meetings. Generally, project design was a participatory process, in line with UNDP's and GEF's requirements.

Approach to stakeholder participation

281. The project's approach to stakeholder involvement and participation is premised on the principles outlined in **Table 14** below.

TABLE 14: STAKEHOLDER PARTICIPATION PRINCIPLES

Principle	Stakeholder participation will:
Value Adding	Be an essential means of adding value to the project
Inclusivity	Include all relevant stakeholders
Accessibility	Be accessible and promote involvement in decision-making process
Transparency	Be based on transparency and fair access to information; main provisions of the project's plans and results will be published in local mass-media
Fairness	Ensure that all stakeholders are treated with respect in a fair and unbiased way
Accountability	Be based on a commitment to accountability by all stakeholders
Constructive	Seek to manage conflict positively and to promote the public interest
Redressing	Seek to redress inequity and injustice
Capacitating	Seek to develop the capacity of all stakeholders
Needs Based	Be based on the perceived and real needs of all stakeholders
Flexible	Be flexibly designed and implemented
Rational and Coordinated	Be rationally planned and coordinated, and not on an *ad hoc* basis
Excellence	Be subject to on-going reflection and improvement

282. The project will focus stakeholder engagement at two levels of intervention: (i) working with national, provincial and local public institutions and agencies in order to strengthen their capacity to consolidate, expand and effectively manage the PA System and to align project activities with government's strategic priorities; and (ii) working directly with civil society organisations, formal and informal resource users (rights holders), private landowners and individuals to strengthen collaborative

relationships with individual PAs, demonstrate co-management arrangements, mitigate impacts of sectoral practices, and optimise the benefits arising from project activities.

Stakeholder involvement plan

283. During the project preparation stage, a preliminary stakeholder analysis was undertaken in order to identify key stakeholders, assess their interests in the project and define their roles and responsibilities in project implementation. A full Stakeholder Involvement Plan remains to be prepared upon project inception. **Table 15** below describes the major categories of stakeholders identified, and the level of involvement envisaged in the project.

TABLE 15: KEY STAKEHOLDERS AND ROLES AND RESPONSIBILITIES IN THE PROJECT

Stakeholder	Roles and Responsibilities
Ministry of Finance	Operational Focal Point (OFP). Coordination and implementation of GEF projects
State Forestry Administration (including National Wetland Conservation Center)	Responsible for forest lands, most of China's nature reserves, wildlife issues, wildlife trade (CITES), wetlands protection (Ramsar Convention), drafting of departmental level regulations especially wetlands.
Hainan Provincial Government	Responsible for provincial administration, development planning and implementation, as well as planning and financing of the provincial PA system. Leadership and coordination for implementation of the project
Standing Committee of People's Congress of Hainan Province	Responsible for coordination of legislation and regulation functions in Hainan, including the provincial regulation of nature reserve management and regulation of wetland conservation.
Hainan Province Development and Reform Commission	Coordination and implementation of Hainan's Development Plan (including wetland conservation)
Hainan Department of Finance	Financial responsibility for the project, including compilation and submission of budget requests
Hainan Forestry Department at provincial and local government levels (including NR bureau and wildlife protection bureau)	Responsible for planning and managing the provincial PA system, and conservation of fauna and flora in the province. Also responsible for wetland management. The Provincial Forestry Department will be the main executing agency of the project.
Hainan Marine and Fishery Department	Implement and oversee the national Oceanic and Fishery policies, monitor the marine economy operation, protect marine and fishery environment, coastal aquaculture development, management of marine nature reserves
Hainan Water Resources Department	Sustain water availability, security and quality control, avoiding over-exploitation of water resources
Hainan Land Environment and Resource Department, Ecology Bureau and local govt bureaus	PA system planning and management of specific nature reserves. Coordination of environmental issues, pollution and CBD implementation and reporting, execution of CBPF. Processing and coordination of drafting new legislation. Must be involved in any proposed regulatory revisions.
Hainan Tourism Department	Responsible for planning and implementing tourism development plans. High levels of collaboration and mainstreaming required to ensure tourism plans do not threaten NRs.
Agriculture department of provincial and local governments	Responsible for agriculture and fisheries, including agrobiodiversity. Major stakeholder in terms of water use and sources of agricultural water pollution responsible for freshwater and brackish fisheries. Should mainstream biodiversity and PA protection within their plans and avoid causing pollution of wetland sites. Can help monitor wetland biodiversity on agricultural lands adjacent to NRs. Need cooperation in controlling fishing within sustainable limits.
Land department of provincial and local governments	Responsible for land use planning and land allocation. Critical partner to ensure sound coastal land use planning under development and sectoral plans.
Hainan Meteorology Bureau	Monitoring of climatic factors, models of climate change, effects on vegetation, etc.

Stakeholder	Roles and Responsibilities
Haikou City government	Responsible for the city administration, development planning and implementation, as well as management of Dongzhaigang NNR
Management Bureaus of Nature Reserves (Dongzhaigang NNR, Qinglangang PNR, Dongfang PNR, Xingying Mangrove NWP, Sanya Mangrove NR, Danzhou Xinying Mangrove NR, Huachangwan Mangrove NR)	Planning, protection and management of nature reserves, visitor control and environmental education/awareness. Execution of project activities.
Chinese Academy of Sciences, several specialized and regional academic and research institutes, universities, including: Tsinghua University, Hainan University, Hainan Normal University, Research Institute of Tropical Forestry, Hainan Marine Development and Design Institute.	Technical expertise available on hydrological, botanical and zoological aspects. Available for sub-contracted research, specialist training workshops, post-graduate courses and programmes
Local target communities/project partners	Primary resource users and traditional management of wetland and forest ecosystems, including women. Local communities around the mangrove PAs will be participants in the co-management activities as well as being beneficiaries of the livelihood support. For the PA expansion and consolidation component, local residents including indigenous/ethnic minorities in inland areas will fully participate in the process of determining the new PA boundaries as well as the rights and responsibilities of the resident communities over resources within the PAs and in the model buffer zones. There are two main ethnic minorities Li (800,000) and Miao (50,000) living mainly in the inland mountain areas in the south western parts of Hainan. Although they will not directly benefit from the enhanced mangrove management, they will indirectly benefit from the strengthened PA system in Hainan including mountain forest PAs through its systemic and institutional components. There are also Li minority villages in the vicinity of Sanya Mangrove Nature Reserve and Changjiang Haiwei Wetland Park, which will be proactively considered for involvement in appropriate project related activities.
Other local communities	Not formal partners in co-management, but communities with experience from which the project can learn (e.g., forms of community governance, traditional use of biodiversity, etc.)
Private sector organizations and businesses	At both Dongzhaigang NNR and Xinying NWP, farm companies are key stakeholders, managing land use, related infrastructure and playing an important role in relation to local communities. Their involvement in related activities such as community co-management, awareness events and in participating in the resolution of conflicts and threats is important. At Qinglangang and Dongzhaigang, tourism companies have a major role in local development and are significant partners for the reserves to engage in supporting habitat restoration, employment for local communities and ecologically sustainable development. Other business interests will also be involved.
NGOs in Hainan Province, national and international environmental NGOs (e.g. Wetlands International, WWF, local NGOs)	Involvement in wetlands and biodiversity projects. Available for technical support, consultancies, training and monitoring. High capacity for grass roots action with local communities.

Stakeholder	Roles and Responsibilities
The Youth Volunteer Association with Economy and Administration School of Hainan Normal University and Tourism Research Society with Institute of Economics in Haikou	Involvement in environmental awareness promotion and social investigation related activities
Hainan Bird Watching Association and Green Leaf Environmental Conservation Association under Hainan University	Involvement in bird monitoring and survey related activities.
Haikou Xingda Banana Specialized Cooperative Society and Haikou Jiangbin Aquaculture Specialized Cooperative Society	Can contribute to promoting best practices and modern techniques as well as knowledge in terms of sustainable agriculture development to mitigate threats caused by incompatible agricultural and aquacultural practices. The two societies can also play an important role in promoting advanced environmentally friendly knowledge and techniques to facilitate the implementation of alternative livelihoods.
China Mangrove Conservation Alliance	Can contribute to mangrove reforestation activities.

284. The project proposes a mechanism to achieve broad-based stakeholder involvement in the project preparation and implementation processes. Stakeholder participation will include the following three components (see **Table 16**):

- Project Steering Committee (PSC)
- Project Management Office (PMO)
- Stakeholder Committees at site level

TABLE 16. SUGGESTED MEMBERS OF PSC, PCU AND SITE STAKEHOLDER COMMITTEES:

Project Steering Committee (PSC), UNDP to attend project meetings	Project Management Office (PMO)	Stakeholder Committees (for selected demonstration areas)
Participating provincial agencies: Hainan Forestry Dept, Hainan Dept of Finance, Land Envt & Resources Dept, Marine & Fisheries Dept, Development Reform Commission, Water Resources Dept, Tourism Commission [possibly others – to be confirmed at project inception] Local government agencies and management bureaus representing the demonstration PAs UNDP, Project Team, invited technical experts	Hainan Forestry Department PPD, Director of PMO – Hainan Bureau of Wild Animal & Plant Conservation Director, Project Manager, Project Assistant, Dongzhaigang NNR Management Bureau, contracted technical staff, etc.	Local community leaders NR Bureau staff Contracted staff Local Government (Township) Private sector organizations and businesses

Long-term stakeholder participation

285. The project will provide the following opportunities for long-term participation of all stakeholders, with a special emphasis on the active participation of local communities, and enhancement of inter-sectoral coordination for the PA system:

286. Decision-making – through the establishment of the Project Steering Committee. The establishment of the structure will follow a participatory and transparent process involving the confirmation of all key project stakeholders; conducting one-to-one consultations with all stakeholders; development of Terms of Reference and ground-rules; inception meeting to agree on the constitution of the Board.

287. Capacity building – at systemic, institutional and individual level – is one of the key strategic interventions of the project and will target all stakeholders that have the potential to be involved in brokering, implementing and/or monitoring management agreements related to activities in and around the reserves. The project will target especially organizations operating at the community level to enable them to actively participate in developing and implementing management agreements. Women and indigenous / minority groups will be proactively considered for capacity building activities based on specific needs assessments.

288. Communication - will include the participatory development of an integrated communication strategy. The communication strategy will be based on the following key principles:

- providing information to all stakeholders;
- promoting dialogue between all stakeholders;
- promoting access to information.

289. The project's design incorporates several features to ensure on-going and effective stakeholder participation in the project's implementation. The mechanisms to facilitate involvement and active participation of different stakeholder in project implementation will comprise a number of different components:

i) Project inception workshop

The project will be launched by a multi-stakeholder workshop. This workshop will provide an opportunity to provide all stakeholders with the most updated information on the project, refine and confirm the work plan, and will establish a basis for further consultation as the project's implementation commences.

ii) Constitution of Project Steering Committee

A Project Steering Committee's constituency will be constituted to ensure broad representation of all key interests throughout the project's implementation. The representation, and broad terms of reference, of the PSC are described in the Management Arrangements in Part III of the Project Document.

iii) Establishment of the Project Management Office

The Project Management Office will take direct operational responsibility for facilitating stakeholder involvement and ensuring increased local ownership of the project and its results. The PMO will be located in the Hainan Bureau of Wild Animal & Plant Conservation offices at Hainan Forestry Department in Haikou to ensure coordination among key stakeholder organizations at the provincial level during the project period. Dongzhaigang NNR management bureau will coordinate demonstration activities under component 2 under delegated authority from HFD.

iv) Establishment of local working groups

At the activity level, local or specialist working groups (e.g., legal review team, database and monitoring team, PA system strategy and action plan development team, community involvement team) will be established, as required, to facilitate the active participation of affected institutions, organisations and individuals in the implementation of the respective project activities. Different stakeholder groups may take the lead in each of the working groups, depending on their respective mandates. There will be equitable representation of women and ethnic minorities on site stakeholder committees and groups related to community co-management, alternative livelihoods and awareness activities.

v) Project communications

The project will develop, implement and annually update a communications strategy to ensure that all stakeholders are informed on an on-going basis about: the project's objectives; the project's activities; overall project progress; and the opportunities for stakeholders' involvement in various aspects of the project's implementation.

vi) Implementation arrangements

290. A number of project activities have specifically been designed to directly involve local stakeholders in the implementation of, and benefit from, these activities. These include: the creation or development of new opportunities for sustainable livelihood options and natural resource uses for local communities, stemming from the feasibility assessment studies and co-management models. Women and indigenous / minority groups will be proactively considered for participation in sustainable livelihood activities based on these assessments.

vii) Formalizing cooperative governance structures

The project will actively seek to formalize cooperative governance structures at the level of PAs or their sub-units, to ensure on-going participation of local stakeholders in the planning and management of selected demonstration NRs.

viii) Capacity building

All project activities are strategically focused on building capacity – at systemic, institutional and individual levels – of the key stakeholder groups to ensure sustainability of initial project investments. The project will also seek to raise public awareness of the value and importance of the wetland ecosystem services and biodiversity secured through effective habitat conservation.

Coordination with related initiatives

291. The project will also build on the experiences and lessons learned by wetland components of previous GEF projects in China. **Table 17** below outlines the coordination with related initiatives.

TABLE 17. COORDINATION WITH RELATED INITIATIVES

Initiatives / Interventions	How collaboration with the project will be ensured
CBPF MSL Programme, national level project and Provincial level projects	The CBPF will provide a national platform to ensure strong coordination between approved and planned GEF biodiversity projects as well as other relevant initiatives of the Government and development agencies. Under the CBPF, the MSL Programme has been established, comprising a national level coordination project and six provincial projects executed by the provincial bureau of the SFA of which this project is the Hainan component. A

Initiatives / Interventions	How collaboration with the project will be ensured
	programme level steering committee will be established chaired by the SFA, to ensure complementarity, synergetic outcome and lessons and experience sharing. This project will be executed by and coordinated at provincial level by the Hainan Forestry Bureau, however it directly benefits from and feeds into the national level project and contribute to the programmatic level outcomes. The Project Steering Committee for this project will coordinate planning with the MSL Programme and national project in particular, while the PMO will conduct operational coordination including shared activities and info exchange.
UNDP/GEF Biodiversity Management in the Coastal Area of the China South Sea project (NEA State Oceanic Administration)	Ending in December 2012, this project provides relevant experiences and lessons on sustainable livelihood strategies in Sanya and Guangxi Autonomous Region with regard to marine PAs. Some of the approaches to management, sustainable financing and lessons learned under this project will be useful to adapt to Hainan mangroves protection. This includes financial approaches towards penalizing localized sources of land-based pollution and internalizing returns to PA mgt. See Outcome 1 (Output 1.1) for further details.
UNEP/GEF Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand	Completed in December 2008, this project conducted comparable activities at the Fangchenggang demonstration mangrove site in Guangxi. The work completed on valuation of ecosystem services for mangroves is of particular interest and use for the current project's outputs on economic valuation. The project's outcome on modeling the nutrient assimilative capacity of the South China Sea Basin included development of a modeling system that enables estimation of land-based nutrient loading via rivers, see: http://www.unepscs/nutrient_model/. It has been recommended that this regional modeling effort should be continued and linked with other regional programmes such as COBSEA (the Co-ordinating Body for the Seas of East Asia).
FAO/GEF Demonstration of Estuarine Biodiversity Conservation, Restoration and Protected Area Networking in China (NEA State Oceanic Administration)	CEO Endorsement submitted June 2012. The Project's specific objective is to mainstream the conservation of estuarine biodiversity in economic sector development plans and develop a series of "best practices" based on experiences derived from project supported field activities focusing on the creation of protected area networks and wetland conservation and restoration in the Yellow and Pearl River Estuaries. While focusing on different study areas, there will be significant parallels with the current project and obvious advantages in maintaining close coordination and information sharing. It is proposed that the PMO should establish contact with the FAO project at project inception to define coordination arrangements, with potential for cross-representation on project committees and working groups.
Australia – China Environment Development Partnership (ACEDP) 2007-2012 Wetlands Management Policy Guidelines & Capacity Building Project	The project aims to prepare draft national guidelines for (i) management planning and monitoring of RAMSAR listed wetlands, (ii) assessment and construction of national wetland parks and (iii) restoration of wetlands. Following evaluation of the draft guidelines at project pilot sites and subsequent refinement, the guidelines will be in a stage where they might be adopted by Chinese authorities, ultimately leading to improved wetland management outcomes. Dongzhaigang was one of the pilot sites, so the results and final guidelines should be considered during management planning for the demonstration sites.

Project Annexes

Annex 1. BD-1 Tracking Tool (METT and Financial Sustainability Scorecard)

The full Tracking Tool is annexed as an Excel workbook.

METT Section One Data:

Name of reviewers completing tracking tool and completion dates

	Name	Title	Agency
CEO Endorsement Nov. 2012	Lucy Yu	Programme Consultant	
Project Mid-term			
Final Evaluation/project completion			

Project coverage in hectares

Targets and Timeframe	**Foreseen at project start (ha)**	**Achievement at Mid-term Evaluation of Project (ha)**	**Achievement at Final Evaluation of Project (ha)**
Total Project Coverage*	**325,195**		
A. Total Extent in hectares of protected areas targeted by the project by WWF Terrestrial MHTs			
Tropical & Subtropical Moist Broadleaf Forests	242,125		
Mangrove (subtropical and tropical, salt water inundated)	9,171		
B. Total Extent in hectares of protected areas targeted by the project by WWF Freshwater MHTs and Ecoregion(s)			
Tropical and subtropical coastal rivers	33,632		
Hainan Ecoregion	*33,632*		
C. Total Extent in hectares of protected areas targeted by the project by WWF Marine MHTs			
Coral reefs	40,267		

Note: * As the project has the wider PA system in scope--the whole Hainan Island, the entire PA system in Hainan is counted as PAs targeted by the Project. The total area of sites that the project will be directly intervened at the site level is highlighted under the mangrove MHT as indicated above.

Annex 2. Capacity Development Scorecard for Hainan Provincial PA System Agencies

2.1 UNDP CAPACITY SCORECARD: HAINAN FORESTRY DEPARTMENT

Strategic Area of Support	Issue	Outcome Indicators	Score:		Evaluative Comments
1. Capacity to conceptualize and formulate policies, legislations, strategies and programmes	1. The protected area agenda is being effectively championed / driven forward	There is essentially no protected area agenda;	0	**2**	Hainan Forestry Department (HFD) highly emphasizes the development of nature reserve plan and they update Hainan Nature Reserve Development Plan (HNRDP) at an interval of five years. However, the HNRDP should also be in line with relevant national and sub-national policies to ensure its implementation. Due to inconsistency of policies, HNRDP usually stays on paper. Consequently, there is no champion to promote the implementation of HNRDP.
		There are some persons or institutions actively pursuing a protected area agenda but they have little effect or influence;	1		
		There are a number of protected area champions that drive the protected area agenda, but more is needed;	2		
		There are an adequate number of able "champions" and "leaders" effectively driving forwards a protected area agenda	3		
	2. There is a strong and clear legal mandate for the establishment and management of protected areas	There is no legal framework for protected areas;	0	**2**	There are some regulations and bylaws, e.g., Regulations on Nature Reserve Protection in China (1994) and Regulations on Mangrove Protection in Hainan Province (enacted in 1998, 1st revision in 2004, the 2nd revision in 2011), which constitutes a sound legal umbrella for protected areas at large.
		There is a partial legal framework for protected areas but it has many inadequacies;	1		
		There is a reasonable legal framework for protected areas but it has a few weaknesses and gaps;	2		
		There is a strong and clear legal mandate for the establishment and management of protected areas	3		
	3. There is an institution or institutions responsible for protected areas able to strategize and plan.	Protected area institutions have no plans or strategies;	0	**1**	Each protected area is requested to develop their management strategies and plans when they proposed to establish their management institutions. Once institutions are established, management authorities of protected areas will neglect to update their plans and strategies in a timely manner.
		Protected area institutions do have strategies and plans, but these are old and no longer up to date or were prepared in a totally top-down fashion;	1		
		Protected area institutions have some sort of mechanism to update their strategies and plans, but this is irregular or is done in a largely top-down fashion without proper consultation;	2		
		Protected area institutions have relevant, participatorially prepared, regularly updated strategies and plans	3		
2. Capacity to implement	4. There are adequate skills for	There is a general lack of planning and management skills;	0	**1**	PA management authorities have necessary planning and management skills. However, due to lack of coordination

Strategic Area of Support	Issue	Outcome Indicators	Score:		Evaluative Comments
policies, legislation, strategies and programmes	protected area planning and management	Some skills exist but in largely insufficient quantities to guarantee effective planning and management;	1		and cooperation among PA management authorities, it is difficult for them to attain certain skills.
		Necessary skills for effective protected area management and planning do exist but are stretched and not easily available;	2		
		Adequate quantities of the full range of skills necessary for effective protected area planning and management are easily available	3		
	5. There are protected area systems	No or very few protected area exist and they cover only a small portion of the habitats and ecosystems;	0		As for Hainan Forestry Department, they have established a protected areas system comprising 25 nature reserves. The biggest nature reserve covers an area of 50,667 ha.
		Protected area system is patchy both in number and geographical coverage and has many gaps in terms of representativeness;	1		
		Protected area system is covering a reasonably representative sample of the major habitats and ecosystems, but still presents some gaps and not all elements are of viable size;	2	**2**	
		The protected areas includes viable representative examples of all the major habitats and ecosystems of appropriate geographical scale	3		
	6. There is a fully transparent oversight authority (there are fully transparent oversight authorities) for the protected areas institutions	There is no oversight at all of protected area institutions;	0		Each protected area governed by a forestry bureau is superintended by its superior management department, other relevant financial, supervision and regulatory, evaluation, and audit departments collectively and transparently.
		There is some oversight, but only indirectly and in a non-transparent manner;	1		
		There is a reasonable oversight mechanism in place providing for regular review but lacks in transparency (e.g. is not independent, or is internalized) ;	2	**3**	
		There is a fully transparent oversight authority for the protected areas institutions	3		
	7. Protected area institutions are effectively led	Protected area institutions have a total lack of leadership;	0		Leadership of protected area institutions is adequate, but their staffing is suboptimal.
		Protected area institutions exist but leadership is weak and provides little guidance;	1	**2**	
		Some protected area institutions have reasonably strong leadership but there is still need for improvement;	2		

Strategic Area of Support	Issue	Outcome Indicators	Score:		Evaluative Comments
		Protected area institutions are effectively led	3		
	8. Protected areas have regularly updated, participatorially prepared, comprehensive management plans	Protected areas have no management plans;	0	**1**	According to applicable legal framework and policies, management plans for protected areas are not mandatory. Therefore, only some protected areas that implemented international projects developed their management plans that are not linked to institutional budget allocations, which seriously impact their implementation in practice. The management plans of protected areas are developed to pursue good management of conservation targets in line with management objectives without considering benefits of relevant stakeholders rationally.
		Some protected areas have up-to-date management plans but they are typically not comprehensive and were not participatorially prepared;	1		
		Most Protected Areas have management plans though some are old, not participatorially prepared or are less than comprehensive;	2		
		Every protected area has a regularly updated, participatorially prepared, comprehensive management plan	3		
	9. Human resources are well qualified and motivated	Human resources are poorly qualified and unmotivated;	0	**1**	It is challenging for protected areas to form a qualified work force since the practitioners of protected areas have to take on a heavy workload and broad responsibilities but are comparatively badly paid. In addition, lack of an incentive mechanism also contributes to a suboptimal work team for protected areas.
		Human resources qualification is spotty, with some well qualified, but many only poorly and in general unmotivated;	1		
		HR in general reasonably qualified, but many lack in motivation, or those that are motivated are not sufficiently qualified;	2		
		Human resources are well qualified and motivated.	3		
	10. Management plans are implemented in a timely manner effectively achieving their objectives	There is very little implementation of management plans;	0	**1**	Compared to evaluating implementation effects, protected areas are more interested in implementing approved work plans since there does not exist any monitoring system. Lack of dedicated budget resources also hampers the implementation of management plans.
		Management plans are poorly implemented and their objectives are rarely met;	1		
		Management plans are usually implemented in a timely manner, though delays typically occur and some objectives are not met;	2		
		Management plans are implemented in a timely manner effectively achieving their objectives	3		
	11. Protected area institutions are able to adequately mobilize sufficient quantity of funding, human and material resources to	Protected area institutions typically are severely underfunded and have no capacity to mobilize sufficient resources;	0	**1**	Management authorities of protected areas can receive approved appropriations from central, provincial, and city (county) finance and are empowered to mobilize human and material resources independently. The real problem is that funds received by protected areas are far below that needed for their actual management.
		Protected area institutions have some funding and are able to mobilize some human and material resources but not enough to effectively implement their mandate;	1		

Strategic Area of Support	Issue	Outcome Indicators	Score:		Evaluative Comments
	effectively implement their mandate	Protected area institutions have reasonable capacity to mobilize funding or other resources but not always in sufficient quantities for fully effective implementation of their mandate;	2		
		Protected area institutions are able to adequately mobilize sufficient quantity of funding, human and material resources to effectively implement their mandate	3		
	12. Protected area institutions are effectively managed, efficiently deploying their human, financial and other resources to the best effect	While the protected area institution exists it has no management;	0		Management authorities of protected areas can manage available resources wisely to achieve maximum conservation effects by strictly complying with applicable regulations once they get superior agencies' approval.
		Institutional management is largely ineffective and does not deploy efficiently the resources at its disposal;	1		
		The institution(s) is (are) reasonably managed, but not always in a fully effective manner and at times does not deploy its resources in the most efficient way;	2	**2**	
		The protected area institution is effectively managed, efficiently deploying its human, financial and other resources to the best effect	3		
	13. Protected area institutions are highly transparent, fully audited, and publicly accountable	Protected area institutions totally untransparent, not being held accountable and not audited;	0		Financial auditing and accountability system of management responsibilities are in place.
		Protected area institutions are not transparent but are occasionally audited without being held publicly accountable;	1		
		Protected area institutions are regularly audited and there is a fair degree of public accountability but the system is not fully transparent;	2	**2**	
		The Protected area institutions are highly transparent, fully audited, and publicly accountable	3		
	14. There are legally designated protected area institutions with the authority to carry out their mandate	There is no lead institution or agency with a clear mandate or responsibility for protected areas;	0		Different elements of protected areas are managed by one or several governmental agencies within their legal jurisdiction. However, different agencies usually cannot reach a consensus in coping with specific conservation problems when their interests are involved.
		There are one or more institutions or agencies dealing with protected areas but roles and responsibilities are unclear and there are gaps and overlaps in the arrangements;	1	**2**	

Strategic Area of Support	Issue	Outcome Indicators	Score:		Evaluative Comments
		There are one or more institutions or agencies dealing with protected areas, the responsibilities of each are fairly clearly defined, but there are still some gaps and overlaps;	2		
		Protected Area institutions have clear legal and institutional mandates and the necessary authority to carry this out	3		
	15. Protected areas are effectively protected	No enforcement of regulations is taking place;	0	**2**	Usually, relevant bylaws and regulations were formulated and revised by soliciting inputs of relevant stakeholders, which greatly removed barriers to follow-up implementation. Despite this, some stakeholders, e.g., aquaculture and mariculture farmers, still take advantage of innocent villagers to resist law enforcement.
		Some enforcement of regulations but largely ineffective and external threats remain active;	1		
		Protected area regulations are regularly enforced but are not fully effective and external threats are reduced but not eliminated;	2		
		Protected Area regulations are highly effectively enforced and all external threats are negated	3		
	16. Individuals are able to advance and develop professionally	No career tracks are developed and no training opportunities are provided;	0	**2**	Staff trainings are generally developed and granted due to job demand. Sometimes, when there is a training opportunity, staff that doesn't need such skills or knowledge is sent out for training for the reason that relevant staff is not available at that moment.
		Career tracks are weak and training possibilities are few and not managed transparently;	1		
		Clear career tracks developed and training available; HR management however has inadequate performance measurement system;	2		
		Individuals are able to advance and develop professionally	3		
	17. Individuals are appropriately skilled for their jobs	Skills of individuals do not match job requirements;	0	**1**	The overall competency of protected areas' employees is quite limited. It is necessary to be improved.
		Individuals have some or poor skills for their jobs;	1		
		Individuals are reasonably skilled but could further improve for optimum match with job requirement;	2		
		Individuals are appropriately skilled for their jobs	3		
	18. Individuals are highly motivated	No motivation at all;	0	**1**	Not all management authorities of protected areas have motivation mechanisms. And also, different management authorities take different measures to motivate their staff.
		Motivation uneven, some are but most are not;	1		
		Many individuals are motivated but not all;	2		
		Individuals are highly motivated	3		
	19. There are	No mechanisms exist;	0	**0**	Training, performance monitoring and learning are *ad hoc*.

Strategic Area of Support	Issue	Outcome Indicators	Score:		Evaluative Comments
	appropriate systems of training, mentoring, and learning in place to maintain a continuous flow of new staff	Some mechanisms exist but unable to develop enough and unable to provide the full range of skills needed;	1		
		Mechanisms generally exist to develop skilled professionals, but either not enough of them or unable to cover the full range of skills required;	2		
		There are mechanisms for developing adequate numbers of the full range of highly skilled protected area professionals	3		
3. Capacity to engage and build consensus among all stakeholders	20. Protected areas have the political commitment they require	There is no political will at all, or worse, the prevailing political will runs counter to the interests of protected areas;	0	**1**	Political will exists to some extent. However, political will is subject to economic interests. When the existence of protected areas poses a little constraint to local economic development, conservation is over development. When protected areas are in the way of local economic development, economic development will take higher priority.
		Some political will exists, but is not strong enough to make a difference;	1		
		Reasonable political will exists, but is not always strong enough to fully support protected areas;	2		
		There are very high levels of political will to support protected areas	3		
	21. Protected areas have the public support they require	The public has little interest in protected areas and there is no significant lobby for protected areas;	0	**1**	In general, public or private sectors are far from supporting the work of protected areas. Some organizations might push public and private sectors to gain their support when implementing some specific activities. Protected areas mainly rely on media, university, colleges and cooperative partners to conduct certain promotion campaigns.
		There is limited support for protected areas;	1		
		There is general public support for protected areas and there are various lobby groups such as environmental NGO's strongly pushing them;	2		
		There is tremendous public support in the country for protected areas	3		
	22. Protected area institutions are mission oriented	Institutional mission not defined;	0	**2**	Institutional mission has not well publicized, partially for the reason that protected area institutions have a low profile.
		Institutional mission poorly defined and generally not known and internalized at all levels;	1		
		Institutional mission well defined and internalized but not fully embraced;	2		
		Institutional missions are fully internalized and embraced	3		
	23. Protected area institutions can establish the	Protected area institutions operate in isolation;	0	**2**	Some protected areas have conducted cooperation with EU, Germany, Australia. Kadoorie Farm and Botanic Garden have conducted some domestic research involving academia
		Some partnerships in place but significant gaps and existing partnerships achieve little;	1		

Strategic Area of Support	Issue	Outcome Indicators	Score:		Evaluative Comments
	partnerships needed to achieve their objectives	Many partnerships in place with a wide range of agencies, NGOs etc, but there are some gaps, partnerships are not always effective and do not always enable efficient achievement of objectives;	2		as well as universities/colleges. It has proven that the expected cooperative effects can hardly be met. The underlying reason is that a large proportion of the grant was paid for consultancy fees and very limited grant was really used for conservation activities on the ground and co-financing was in-kind support.
		Protected area institutions establish effective partnerships with other agencies and institutions, including provincial and local governments, NGO's and the private sector to enable achievement of objectives in an efficient and effective manner	3		
	24. Individuals carry appropriate values, integrity and attitudes	Individuals carry negative attitude;	0	**2**	Most staff work actively and positively although some staff complain about low benefits, poor working conditions, and heavy workload.
		Some individuals have notion of appropriate attitudes and display integrity, but most don't;	1		
		Many individuals carry appropriate values and integrity, but not all;	2		
		Individuals carry appropriate values, integrity and attitudes	3		
4. Capacity to mobilize information and knowledge	25. Protected area institutions have the information they need to develop and monitor strategies and action plans for the management of the protected area system	Information is virtually lacking;	0	**1**	Information sharing among different protected area management agencies are lacking. It is difficult to access available information. Most of the time, limited shared information is old and less valuable.
		Some information exists, but is of poor quality, is of limited usefulness, or is very difficult to access;	1		
		Much information is easily available and mostly of good quality, but there remain some gaps in quality, coverage and availability;	2		
		Protected area institutions have the information they need to develop and monitor strategies and action plans for the management of the protected area system	3		
	26. Protected area institutions have the information needed to do their work	Information is virtually lacking;	0	**1**	Different bureaus have not share information that they hold. Information that public can access are out-dated, which does not help towards decision making or in updating the public's understanding on protected areas at all.
		Some information exists, but is of poor quality and of limited usefulness and difficult to access;	1		
		Much information is readily available, mostly of good quality, but there remain some gaps both in quality and quantity;	2		
		Adequate quantities of high quality up to date information for protected area planning, management and monitoring is widely and easily available	3		

Strategic Area of Support	Issue	Outcome Indicators	Score:		Evaluative Comments
	27. Individuals working with protected areas work effectively together as a team	Individuals work in isolation and don't interact;	0	**2**	Team members are only concerned with their own assignments without sharing a mutual mission or objective.
		Individuals interact in limited way and sometimes in teams but this is rarely effective and functional;	1		
		Individuals interact regularly and form teams, but this is not always fully effective or functional;	2		
		Individuals interact effectively and form functional teams	3		
5. Capacity to monitor, evaluate, report and learn	28. Protected area policy is continually reviewed and updated	There is no policy or it is old and not reviewed regularly;	0	**1**	There is no fixed time limit for policy updating and revision. As long as a policy is not applicable and is difficult to be implemented in practice, the policy will be proposed for revision or abolishment.
		Policy is only reviewed at irregular intervals;	1		
		Policy is reviewed regularly but not annually;	2		
		National protected areas policy is reviewed annually	3		
	29. Society monitors the state of protected areas	There is no dialogue at all;	0	**1**	The public can understand the state of protected areas through the dialogue between public and relevant governmental agencies or high-level management bureaus of protected areas.
		There is some dialogue going on, but not in the wider public and restricted to specialized circles;	1		
		There is a reasonably open public dialogue going on but certain issues remain taboo;	2		
		There is an open and transparent public dialogue about the state of the protected areas	3		
	30. Institutions are highly adaptive, responding effectively and immediately to change	Institutions resist change;	0	**2**	Protected area institutions do make adjustments in accordance to requests under applicable updated national policies. However, such adjustments usually cannot totally meet the needs of actual management due to the inconsistency of some policies.
		Institutions do change but only very slowly;	1		
		Institutions tend to adapt in response to change but not always very effectively or with some delay;	2		
		Institutions are highly adaptive, responding effectively and immediately to change	3		
	31. Institutions have effective internal mechanisms for monitoring, evaluation, reporting and learning	There are no mechanisms for monitoring, evaluation, reporting or learning;	0	**1**	Every year, only nominal performance evaluation is assessed, which contributes naught to better management later on.
		There are some mechanisms for monitoring, evaluation, reporting and learning but they are limited and weak;	1		
		Reasonable mechanisms for monitoring, evaluation, reporting and learning are in place but are not as strong or comprehensive as they could be;	2		

Annex 2: Capacity Development Scorecard – Hainan Forestry Department

Strategic Area of Support	Issue	Outcome Indicators	Score:		Evaluative Comments
		Institutions have effective internal mechanisms for monitoring, evaluation, reporting and learning	3		
	32. Individuals are adaptive and continue to learn	There is no measurement of performance or adaptive feedback;	0	**1**	There is no systematic performance measurement. Limited performance measurement has been assessed by the way of oral communication instead of formal documentation.
		Performance is irregularly and poorly measured and there is little use of feedback;	1		
		There is significant measurement of performance and some feedback but this is not as thorough or comprehensive as it might be;	2		
		Performance is effectively measured and adaptive feedback utilized	3		
TOTAL SCORE			**96**	**48**	
				50%	

2.2 UNDP CAPACITY SCORECARD: HAINAN LAND ENVIRONMENT AND RESOURCES DEPARTMENT

Strategic Area of Support	Issue	Outcome Indicators	Score:		Evaluative Comments
1. Capacity to conceptualize and formulate policies, legislations, strategies and programmes	1. The protected area agenda is being effectively championed / driven forward	There is essentially no protected area agenda;	0	**2**	PA governance comprises administrative and comprehensive management. Different PAs are supervised by their administrative management bureaus respectively. Environmental protection bureaus in China are responsible for overall governance of protected areas according to the State Council's assignment. Different governmental sectors manage various elements of protected areas within their jurisdiction.
		There are some persons or institutions actively pursuing a protected area agenda but they have little effect or influence;	1		
		There are a number of protected area champions that drive the protected area agenda, but more is needed;	2		
		There are an adequate number of able "champions" and "leaders" effectively driving forwards a protected area agenda	3		
	2. There is a strong and clear legal mandate for the establishment and management of protected areas	There is no legal framework for protected areas;	0	**2**	A composite of laws and regulations provide legal security for PA management in Hainan as in other provinces of China, e.g., Regulations on Nature Reserve Conservation in China (1994), Forest Conservation Law in China (issued in 1984 and revised in 1998), Water Protection Law in China (2002) and Wildlife Protection Law in China (revised in 2004) just to name a few. However, there is no specific law to legally support a variety of PA management in China. These comprehensive laws mentioned above only provide very general guidance on PA management and are difficult to be implemented without detailed rules and regulations. In addition, many acts of these laws and regulations are out of date and inconsistent. More provincial-level regulations or bylaws should be enacted to support PA management to lay a solid ecological foundation for economic development.
		There is a partial legal framework for protected areas but it has many inadequacies;	1		
		There is a reasonable legal framework for protected areas but it has a few weaknesses and gaps;	2		
		There is a strong and clear legal mandate for the establishment and management of protected areas	3		
	3. There is an institution or	Protected area institutions have no plans or strategies;	0	**3**	Hainan Environment Protection Department (HLERD) does develop PA plan and

Strategic Area of Support	Issue	Outcome Indicators	Score:		Evaluative Comments
	institutions responsible for protected areas able to strategize and plan.	Protected area institutions do have strategies and plans, but these are old and no longer up to date or were prepared in a totally top-down fashion;	1		strategies that are scarcely 100% implemented due to various limiting factors, e.g., budget inadequacy, low willingness of local government and so on.
		Protected area institutions have some sort of mechanism to update their strategies and plans, but this is irregular or is done in a largely top-down fashion without proper consultation;	2		
		Protected area institutions have relevant, participatorially prepared, regularly updated strategies and plans	3		
2. Capacity to implement policies, legislation, strategies and programmes	4. There are adequate skills for protected area planning and management	There is a general lack of planning and management skills;	0		In Hainan Province, PAs established their specific management bureaus that can perform their duties with relevant skills.
		Some skills exist but in largely insufficient quantities to guarantee effective planning and management;	1		
		Necessary skills for effective protected area management and planning do exist but are stretched and not easily available;	2	**2**	
		Adequate quantities of the full range of skills necessary for effective protected area planning and management are easily available	3		
	5. There are protected area systems	No or very few protected area exist and they cover only a small portion of the habitats and ecosystems;	0		Hainan Province has established a PA system encompassing the majority of habitats and ecosystems, including both terrestrial and marine ecosystems. Despite of this, some PAs are too small to conserve their conservation targets effectively.
		Protected area system is patchy both in number and geographical coverage and has many gaps in terms of representativeness;	1		
		Protected area system is covering a reasonably representative sample of the major habitats and ecosystems, but still presents some gaps and not all elements are of viable size;	2	**2**	
		The protected areas includes viable representative examples of all the major habitats and ecosystems of appropriate geographical scale	3		
	6. There is a fully transparent oversight authority (there are fully	There is no oversight at all of protected area institutions;	0		Evaluating management effectiveness of PAs is collaboratively conducted by all relevant governmental sectors. Evaluation results only feedback to relevant
		There is some oversight, but only indirectly and in a non-transparent manner;	1	**2**	

Strategic Area of Support	Issue	Outcome Indicators	Score:		Evaluative Comments
	transparent oversight authorities) for the protected areas institutions	There is a reasonable oversight mechanism in place providing for regular review but lacks in transparency (e.g. is not independent, or is internalized) ;	2		government sectors and are not open to the public.
		There is a fully transparent oversight authority for the protected areas institutions	3		
	7. Protected area institutions are effectively led	Protected area institutions have a total lack of leadership;	0	**2**	In Hainan, HLERD, Hainan Forestry Department (HFD), and Hainan Ocean and Fishery Department (HOFD) are respectively prosecuting their responsibilities. These bureaus are basically competent at their assignment.
		Protected area institutions exist but leadership is weak and provides little guidance;	1		
		Some protected area institutions have reasonably strong leadership but there is still need for improvement;	2		
		Protected area institutions are effectively led	3		
	8. Protected areas have regularly updated, participatorially prepared, comprehensive management plans	Protected areas have no management plans;	0	**2**	All protected areas with management authorities have developed their master plans. However, management plans are not mandatory according to current management regulations or laws.
		Some protected areas have up-to-date management plans but they are typically not comprehensive and were not participatorially prepared;	1		
		Most Protected Areas have management plans though some are old, not participatorially prepared or are less than comprehensive;	2		
		Every protected area has a regularly updated, participatorially prepared, comprehensive management plan	3		
	9. Human resources are well qualified and motivated	Human resources are poorly qualified and unmotivated;	0	**1**	Staffing is insufficient, in particular lack of professional employees. The majority of staff do not have any professional background, which greatly hampers the management effectiveness of PAs.
		Human resources qualification is spotty, with some well qualified, but many only poorly and in general unmotivated;	1		
		HR in general reasonably qualified, but many lack in motivation, or those that are motivated are not sufficiently qualified;	2		
		Human resources are well qualified and motivated.	3		
	10. Management plans are	There is very little implementation of management plans;	0	**2**	Most activities indicated in master plan [different from management plan] can be

Strategic Area of Support	Issue	Outcome Indicators	Score:		Evaluative Comments
	implemented in a timely manner effectively achieving their objectives	Management plans are poorly implemented and their objectives are rarely met;	1		implemented.
		Management plans are usually implemented in a timely manner, though delays typically occur and some objectives are not met;	2		
		Management plans are implemented in a timely manner effectively achieving their objectives	3		
	11. Protected area institutions are able to adequately mobilize sufficient quantity of funding, human and material resources to effectively implement their mandate	Protected area institutions typically are severely underfunded and have no capacity to mobilize sufficient resources;	0	**1**	Understaffing and budget insufficiency cannot ensure the achievement of management objectives.
		Protected area institutions have some funding and are able to mobilize some human and material resources but not enough to effectively implement their mandate;	1		
		Protected area institutions have reasonable capacity to mobilize funding or other resources but not always in sufficient quantities for fully effective implementation of their mandate;	2		
		Protected area institutions are able to adequately mobilize sufficient quantity of funding, human and material resources to effectively implement their mandate	3		
	12. Protected area institutions are effectively managed, efficiently deploying their human, financial and other resources to the best effect	While the protected area institution exists it has no management;	0	**2**	The current level of available resources can allow the PA institutions to meet their basic functions in PA governance but cannot ensure them to achieve optimum stewardship.
		Institutional management is largely ineffective and does not deploy efficiently the resources at its disposal;	1		
		The institution(s) is (are) reasonably managed, but not always in a fully effective manner and at times does not deploy its resources in the most efficient way;	2		
		The protected area institution is effectively managed, efficiently deploying its human, financial and other resources to the best effect	3		
	13. Protected area institutions are highly transparent, fully audited, and publicly	Protected area institutions totally untransparent, not being held accountable and not audited;	0	**2**	All institutions that are managed by referring regulations on civil servants units should be financially audited annually.
		Protected area institutions are not transparent but are occasionally audited without being held publicly accountable;	1		

Strategic Area of Support	Issue	Outcome Indicators	Score:		Evaluative Comments
	accountable	Protected area institutions are regularly audited and there is a fair degree of public accountability but the system is not fully transparent;	2		
		The Protected area institutions are highly transparent, fully audited, and publicly accountable	3		
	14. There are legally designated protected area institutions with the authority to carry out their mandate	There is no lead institution or agency with a clear mandate or responsibility for protected areas;	0	**2**	In terms of PAs' governance in Hainan, dual management mechanisms, comprehensive management and administrative management, co-exist at the same time based on a clear definition of responsibilities. However, there still exist some gaps and overlap in certain functions.
		There are one or more institutions or agencies dealing with protected areas but roles and responsibilities are unclear and there are gaps and overlaps in the arrangements;	1		
		There are one or more institutions or agencies dealing with protected areas, the responsibilities of each are fairly clearly defined, but there are still some gaps and overlaps;	2		
		Protected Area institutions have clear legal and institutional mandates and the necessary authority to carry this out	3		
	15. Protected areas are effectively protected	No enforcement of regulations is taking place;	0	**2**	Although PAs have a comparatively good legal umbrella, their implementation is far from satisfactory.
		Some enforcement of regulations but largely ineffective and external threats remain active;	1		
		Protected area regulations are regularly enforced but are not fully effective and external threats are reduced but not eliminated;	2		
		Protected Area regulations are highly effectively enforced and all external threats are negated	3		
	16. Individuals are able to advance and develop professionally	No career tracks are developed and no training opportunities are provided;	0	**1**	Some PAs have no training provisions at all.
		Career tracks are weak and training possibilities are few and not managed transparently;	1		
		Clear career tracks developed and training available; HR management however has inadequate performance measurement system;	2		
		Individuals are able to advance and develop professionally	3		
	17. Individuals are appropriately	Skills of individuals do not match job requirements;	0	**1**	Some employees have very limited competencies.

Strategic Area of Support	Issue	Outcome Indicators	Score:		Evaluative Comments
	skilled for their jobs	Individuals have some or poor skills for their jobs;	1		
		Individuals are reasonably skilled but could further improve for optimum match with job requirement;	2		
		Individuals are appropriately skilled for their jobs	3		
	18. Individuals are highly motivated	No motivation at all;	0	**1**	Some nature reserves have no any incentive mechanisms.
		Motivation uneven, some are but most are not;	1		
		Many individuals are motivated but not all;	2		
		Individuals are highly motivated	3		
	19. There are appropriate systems of training, mentoring, and learning in place to maintain a continuous flow of new staff	No mechanisms exist;	0	**1**	Some nature reserves have no such kinds of training mechanism at all.
		Some mechanisms exist but unable to develop enough and unable to provide the full range of skills needed;	1		
		Mechanisms generally exist to develop skilled professionals, but either not enough of them or unable to cover the full range of skills required;	2		
		There are mechanisms for developing adequate numbers of the full range of highly skilled protected area professionals	3		
3. Capacity to engage and build consensus among all stakeholders	20. Protected areas have the political commitment they require	There is no political will at all, or worse, the prevailing political will runs counter to the interests of protected areas;	0	**1**	Current political will of decision makers cannot provide enough support to safeguard PAs in Hainan.
		Some political will exists, but is not strong enough to make a difference;	1		
		Reasonable political will exists, but is not always strong enough to fully support protected areas;	2		
		There are very high levels of political will to support protected areas	3		
	21. Protected areas have the public support they require	The public has little interest in protected areas and there is no significant lobby for protected areas;	0	**2**	Public generally supports nature conservation work and some organizations and media also provide concrete support.
		There is limited support for protected areas;	1		
		There is general public support for protected areas and there are various lobby groups such as environmental NGO's strongly pushing them;	2		
		There is tremendous public support in the country for protected areas	3		

Strategic Area of Support	Issue	Outcome Indicators	Score:		Evaluative Comments
	22. Protected area institutions are mission oriented	Institutional mission not defined;	0	**2**	The mission of PA institution is definite and clear.
		Institutional mission poorly defined and generally not known and internalized at all levels;	1		
		Institutional mission well defined and internalized but not fully embraced;	2		
		Institutional missions are fully internalized and embraced	3		
	23. Protected area institutions can establish the partnerships needed to achieve their objectives	Protected area institutions operate in isolation;	0	**2**	Many reserves have conducted cooperation with some universities and research academia.
		Some partnerships in place but significant gaps and existing partnerships achieve little;	1		
		Many partnerships in place with a wide range of agencies, NGOs etc, but there are some gaps, partnerships are not always effective and do not always enable efficient achievement of objectives;	2		
		Protected area institutions establish effective partnerships with other agencies and institutions, including provincial and local governments, NGO's and the private sector to enable achievement of objectives in an efficient and effective manner	3		
	24. Individuals carry appropriate values, integrity and attitudes	Individuals carry negative attitude;	0	**1**	Some staff hold a negative attitude towards their work.
		Some individuals have notion of appropriate attitudes and display integrity, but most don't;	1		
		Many individuals carry appropriate values and integrity, but not all;	2		
		Individuals carry appropriate values, integrity and attitudes	3		
4. Capacity to mobilize information and knowledge	25. Protected area institutions have the information they need to develop and monitor strategies and action plans for the management of	Information is virtually lacking;	0	**2**	PA management institutions have grasped basic information to support their management. Due to limited available resources, the accuracy and comprehensiveness of the data and information should be beefed up.
		Some information exists, but is of poor quality, is of limited usefulness, or is very difficult to access;	1		
		Much information is easily available and mostly of good quality, but there remain some gaps in quality, coverage and availability;	2		

Strategic Area of Support	Issue	Outcome Indicators	Score:		Evaluative Comments
	the protected area system	Protected area institutions have the information they need to develop and monitor strategies and action plans for the management of the protected area system	3		
	26. Protected area institutions have the information needed to do their work	Information is virtually lacking;	0	**2**	Same as above
		Some information exists, but is of poor quality and of limited usefulness and difficult to access;	1		
		Much information is readily available, mostly of good quality, but there remain some gaps both in quality and quantity;	2		
		Adequate quantities of high quality up to date information for protected area planning, management and monitoring is widely and easily available	3		
	27. Individuals working with protected areas work effectively together as a team	Individuals work in isolation and don't interact;	0	**3**	Most management institutions of PAs can work collaboratively.
		Individuals interact in limited way and sometimes in teams but this is rarely effective and functional;	1		
		Individuals interact regularly and form teams, but this is not always fully effective or functional;	2		
		Individuals interact effectively and form functional teams	3		
5. Capacity to monitor, evaluate, report and learn	28. Protected area policy is continually reviewed and updated	There is no policy or it is old and not reviewed regularly;	0	**1**	HLERD is constantly coordinating with other relevant agencies to develop relevant policies. However, developing policies usually goes slowly due to complicated context. Each PA institution can look into policies' dynamics.
		Policy is only reviewed at irregular intervals;	1		
		Policy is reviewed regularly but not annually;	2		
		National protected areas policy is reviewed annually	3		
	29. Society monitors the state of protected areas	There is no dialogue at all;	0	**1**	Monitoring and evaluating results can be accessed by relevant PA governmental agencies. Public cannot be informed accordingly.
		There is some dialogue going on, but not in the wider public and restricted to specialized circles;	1		
		There is a reasonably open public dialogue going on but certain issues remain taboo;	2		
		There is an open and transparent public dialogue about the state of the protected areas	3		
	30. Institutions are highly adaptive,	Institutions resist change;	0	**1**	Relevant governmental agencies can make prompt adaptation to respond to changes in
		Institutions do change but only very slowly;	1		

Strategic Area of Support	Issue	Outcome Indicators	Score:		Evaluative Comments
	responding effectively and immediately to change	Institutions tend to adapt in response to change but not always very effectively or with some delay;	2		actual situation.
		Institutions are highly adaptive, responding effectively and immediately to change	3		
	31. Institutions have effective internal mechanisms for monitoring, evaluation, reporting and learning	There are no mechanisms for monitoring, evaluation, reporting or learning;	0	**2**	Higher management agencies review PA institutions' work periodically without a fixed schedule.
		There are some mechanisms for monitoring, evaluation, reporting and learning but they are limited and weak;	1		
		Reasonable mechanisms for monitoring, evaluation, reporting and learning are in place but are not as strong or comprehensive as they could be;	2		
		Institutions have effective internal mechanisms for monitoring, evaluation, reporting and learning	3		
	32. Individuals are adaptive and continue to learn	There is no measurement of performance or adaptive feedback;	0	**1**	Performance of staff is scarcely evaluated.
		Performance is irregularly and poorly measured and there is little use of feedback;	1		
		There is significant measurement of performance and some feedback but this is not as thorough or comprehensive as it might be;	2		
		Performance is effectively measured and adaptive feedback utilized	3		
TOTAL SCORE			**96**	**54**	
				56%	

2.3 UNDP CAPACITY SCORECARD: HAINAN MARINE AND FISHERIES DEPARTMENT

Strategic Area of Support	Issue	Outcome Indicators	Score:		Evaluative Comments
1. Capacity to conceptualize and formulate policies, legislations, strategies and programmes	1. The protected area agenda is being effectively championed / driven forward	There is essentially no protected area agenda;	0	**2**	Although many persons played an active role in driving PA agenda's development, they demand more resources to drive this issue.
		There are some persons or institutions actively pursuing a protected area agenda but they have little effect or influence;	1		
		There are a number of protected area champions that drive the protected area agenda, but more is needed;	2		
		There are an adequate number of able "champions" and "leaders" effectively driving forwards a protected area agenda	3		
	2. There is a strong and clear legal mandate for the establishment and management of protected areas	There is no legal framework for protected areas;	0	**2**	The current legal framework for PA is comparatively rational although further amelioration is necessary.
		There is a partial legal framework for protected areas but it has many inadequacies;	1		
		There is a reasonable legal framework for protected areas but it has a few weaknesses and gaps;	2		
		There is a strong and clear legal mandate for the establishment and management of protected areas	3		
	3. There is an institution or institutions responsible for protected areas able to strategize and plan.	Protected area institutions have no plans or strategies;	0	**3**	National-level nature reserves developed their management strategies and planning and have updated these strategies and planning periodically. Most provincial-level nature reserves also formulated their management strategies and planning.
		Protected area institutions do have strategies and plans, but these are old and no longer up to date or were prepared in a totally top-down fashion;	1		
		Protected area institutions have some sort of mechanism to update their strategies and plans, but this is irregular or is done in a largely top-down fashion without proper consultation;	2		
		Protected area institutions have relevant, participatorially prepared, regularly updated strategies and plans	3		
2. Capacity to implement	4. There are adequate skills for	There is a general lack of planning and management skills;	0	**2**	Basic skills exist, but cannot meet management needs fully.

Strategic Area of Support	Issue	Outcome Indicators	Score:		Evaluative Comments
policies, legislation, strategies and programmes	protected area planning and management	Some skills exist but in largely insufficient quantities to guarantee effective planning and management;	1		
		Necessary skills for effective protected area management and planning do exist but are stretched and not easily available;	2		
		Adequate quantities of the full range of skills necessary for effective protected area planning and management are easily available	3		
	5. There are protected area systems	No or very few protected area exist and they cover only a small portion of the habitats and ecosystems;	0	**2**	Although some reserves were established, the current PA system needs improvement in quantity and quality.
		Protected area system is patchy both in number and geographical coverage and has many gaps in terms of representativeness;	1		
		Protected area system is covering a reasonably representative sample of the major habitats and ecosystems, but still presents some gaps and not all elements are of viable size;	2		
		The protected areas includes viable representative examples of all the major habitats and ecosystems of appropriate geographical scale	3		
	6. There is a fully transparent oversight authority (there are fully transparent oversight authorities) for the protected areas institutions	There is no oversight at all of protected area institutions;	0	**2**	The current oversight is transparent.
		There is some oversight, but only indirectly and in a non-transparent manner;	1		
		There is a reasonable oversight mechanism in place providing for regular review but lacks in transparency (e.g. is not independent, or is internalized) ;	2		
		There is a fully transparent oversight authority for the protected areas institutions	3		
	7. Protected area institutions are effectively led	Protected area institutions have a total lack of leadership;	0	**2**	PA institutions need to improve their management competency and skills to better perform their functions.
		Protected area institutions exist but leadership is weak and provides little guidance;	1		

Strategic Area of Support	Issue	Outcome Indicators	Score:		Evaluative Comments
		Some protected area institutions have reasonably strong leadership but there is still need for improvement;	2		
		Protected area institutions are effectively led	3		
	8. Protected areas have regularly updated, participatorially prepared, comprehensive management plans	Protected areas have no management plans;	0	**2**	Most reserves have management plans.
		Some protected areas have up-to-date management plans but they are typically not comprehensive and were not participatorially prepared;	1		
		Most Protected Areas have management plans though some are old, not participatorially prepared or are less than comprehensive;	2		
		Every protected area has a regularly updated, participatorially prepared, comprehensive management plan	3		
	9. Human resources are well qualified and motivated	Human resources are poorly qualified and unmotivated;	0	**2**	Personnel have basic competencies to implement their assignments but they need stronger incentive mechanisms to inspire.
		Human resources qualification is spotty, with some well qualified, but many only poorly and in general unmotivated;	1		
		HR in general reasonably qualified, but many lack in motivation, or those that are motivated are not sufficiently qualified;	2		
		Human resources are well qualified and motivated.	3		
	10. Management plans are implemented in a timely manner effectively achieving their objectives	There is very little implementation of management plans;	0	**2**	National-level nature reserves generally implement their management plans promptly by achieving the goals indicated in management plans. Compared with national-level nature reserves, sub-national nature reserve cannot fully achieve their identified goals although they implement their management plans in a timely fashion.
		Management plans are poorly implemented and their objectives are rarely met;	1		
		Management plans are usually implemented in a timely manner, though delays typically occur and some objectives are not met;	2		
		Management plans are implemented in a timely manner effectively achieving their objectives	3		
	11. Protected area institutions are able to adequately	Protected area institutions typically are severely underfunded and have no capacity to mobilize sufficient resources;	0	**2**	National-level PA institutions are empowered to mobilize available resources (including financial and other resources) to implement their

Strategic Area of Support	Issue	Outcome Indicators	Score:		Evaluative Comments
	mobilize sufficient quantity of funding, human and material resources to effectively implement their mandate	Protected area institutions have some funding and are able to mobilize some human and material resources but not enough to effectively implement their mandate;	1		assignments. However, these resources cannot meet their demands to fully perform their responsibilities. In terms of sub-national PA institutions, the resources that they can deploy are seriously scarce.
		Protected area institutions have reasonable capacity to mobilize funding or other resources but not always in sufficient quantities for fully effective implementation of their mandate;	2		
		Protected area institutions are able to adequately mobilize sufficient quantity of funding, human and material resources to effectively implement their mandate	3		
	12. Protected area institutions are effectively managed, efficiently deploying their human, financial and other resources to the best effect	While the protected area institution exists it has no management;	0	**2**	Performance of PA institutions is fair but not effective.
		Institutional management is largely ineffective and does not deploy efficiently the resources at its disposal;	1		
		The institution(s) is (are) reasonably managed, but not always in a fully effective manner and at times does not deploy its resources in the most efficient way;	2		
		The protected area institution is effectively managed, efficiently deploying its human, financial and other resources to the best effect	3		
	13. Protected area institutions are highly transparent, fully audited, and publicly accountable	Protected area institutions totally untransparent, not being held accountable and not audited;	0	**3**	Compared with sub-national level PAs, national-level PAs are managed in transparency by adopting accountability management and comprehensive auditing mechanisms.
		Protected area institutions are not transparent but are occasionally audited without being held publicly accountable;	1		
		Protected area institutions are regularly audited and there is a fair degree of public accountability but the system is not fully transparent;	2		
		The Protected area institutions are highly transparent, fully audited, and publicly accountable	3		
	14. There are legally designated protected area	There is no lead institution or agency with a clear mandate or responsibility for protected areas;	0	**2**	As far as national-level PAs are concerned, their responsibilities are clearly defined. As for sub-national PAs, their responsibilities are not clear

Strategic Area of Support	Issue	Outcome Indicators	Score:		Evaluative Comments
	institutions with the authority to carry out their mandate	There are one or more institutions or agencies dealing with protected areas but roles and responsibilities are unclear and there are gaps and overlaps in the arrangements;	1		enough to support their conservation efforts.
		There are one or more institutions or agencies dealing with protected areas, the responsibilities of each are fairly clearly defined, but there are still some gaps and overlaps;	2		
		Protected Area institutions have clear legal and institutional mandates and the necessary authority to carry this out	3		
	15. Protected areas are effectively protected	No enforcement of regulations is taking place;	0	**2**	Laws and regulations can be partially enforced but law/regulation enforcement needs further improvement.
		Some enforcement of regulations but largely ineffective and external threats remain active;	1		
		Protected area regulations are regularly enforced but are not fully effective and external threats are reduced but not eliminated;	2		
		Protected Area regulations are highly effectively enforced and all external threats are negated	3		
	16. Individuals are able to advance and develop professionally	No career tracks are developed and no training opportunities are provided;	0	**3**	Staff of National-level PAs receive more opportunities compared with their counterparts working at sub-national level PAs.
		Career tracks are weak and training possibilities are few and not managed transparently;	1		
		Clear career tracks developed and training available; HR management however has inadequate performance measurement system;	2		
		Individuals are able to advance and develop professionally	3		
	17. Individuals are appropriately skilled for their jobs	Skills of individuals do not match job requirements;	0	**2**	Staff have some basic skills to meet the minimum requirements of PA management.
		Individuals have some or poor skills for their jobs;	1		
		Individuals are reasonably skilled but could further improve for optimum match with job requirement;	2		
		Individuals are appropriately skilled for their jobs	3		

Annex 2: Capacity Development Scorecard – Hainan Marine and Fisheries Department

Strategic Area of Support	Issue	Outcome Indicators	Score:		Evaluative Comments
	18. Individuals are highly motivated	No motivation at all;	0	**1**	There are few incentive mechanisms.
		Motivation uneven, some are but most are not;	1		
		Many individuals are motivated but not all;	2		
		Individuals are highly motivated	3		
	19. There are appropriate systems of training, mentoring, and learning in place to maintain a continuous flow of new staff	No mechanisms exist;	0	**2**	There are some basic training and exchange activities. Certainly, the current mechanism needs to improve.
		Some mechanisms exist but unable to develop enough and unable to provide the full range of skills needed;	1		
		Mechanisms generally exist to develop skilled professionals, but either not enough of them or unable to cover the full range of skills required;	2		
		There are mechanisms for developing adequate numbers of the full range of highly skilled protected area professionals	3		
3. Capacity to engage and build consensus among all stakeholders	20. Protected areas have the political commitment they require	There is no political will at all, or worse, the prevailing political will runs counter to the interests of protected areas;	0	**2**	Certain political wills exist.
		Some political will exists, but is not strong enough to make a difference;	1		
		Reasonable political will exists, but is not always strong enough to fully support protected areas;	2		
		There are very high levels of political will to support protected areas	3		
	21. Protected areas have the public support they require	The public has little interest in protected areas and there is no significant lobby for protected areas;	0	**2**	The public supports PA conservation and management to some extent.
		There is limited support for protected areas;	1		
		There is general public support for protected areas and there are various lobby groups such as environmental NGO's strongly pushing them;	2		
		There is tremendous public support in the country for protected areas	3		
	22. Protected area institutions are mission oriented	Institutional mission not defined;	0	**3**	Detailed management responsibilities embody the missions of PA institutions specifically.
		Institutional mission poorly defined and generally not known and internalized at all levels;	1		

Annex 2: Capacity Development Scorecard – Hainan Marine and Fisheries Department

Strategic Area of Support	Issue	Outcome Indicators	Score:		Evaluative Comments
		Institutional mission well defined and internalized but not fully embraced;	2		
		Institutional missions are fully internalized and embraced	3		
	23. Protected area institutions can establish the partnerships needed to achieve their objectives	Protected area institutions operate in isolation;	0	**3**	PA institutions have established a partnership with some units and organizations, including but not limited to provincial and local governmental agencies, NGOs, and private sectors.
		Some partnerships in place but significant gaps and existing partnerships achieve little;	1		
		Many partnerships in place with a wide range of agencies, NGOs etc, but there are some gaps, partnerships are not always effective and do not always enable efficient achievement of objectives;	2		
		Protected area institutions establish effective partnerships with other agencies and institutions, including provincial and local governments, NGO's and the private sector to enable achievement of objectives in an efficient and effective manner	3		
	24. Individuals carry appropriate values, integrity and attitudes	Individuals carry negative attitude;	0	**2**	Not all staff have a positive work ethic.
		Some individuals have notion of appropriate attitudes and display integrity, but most don't;	1		
		Many individuals carry appropriate values and integrity, but not all;	2		
		Individuals carry appropriate values, integrity and attitudes	3		
4. Capacity to mobilize information and knowledge	25. Protected area institutions have the information they need to develop and monitor strategies and action plans for the management of the protected area system	Information is virtually lacking;	0	**2**	PA institutions can obtain information that they demand.
		Some information exists, but is of poor quality, is of limited usefulness, or is very difficult to access;	1		
		Much information is easily available and mostly of good quality, but there remain some gaps in quality, coverage and availability;	2		
		Protected area institutions have the information they need to develop and monitor strategies and action plans for the management of the protected area system	3		
	26. Protected area	Information is virtually lacking;	0	**2**	Data and information management are based on

Strategic Area of Support	Issue	Outcome Indicators	Score:		Evaluative Comments
	institutions have the information needed to do their work	Some information exists, but is of poor quality and of limited usefulness and difficult to access;	1		daily accumulation.
		Much information is readily available, mostly of good quality, but there remain some gaps both in quality and quantity;	2		
		Adequate quantities of high quality up to date information for protected area planning, management and monitoring is widely and easily available	3		
	27. Individuals working with protected areas work effectively together as a team	Individuals work in isolation and don't interact;	0	**2**	Basically, staff can work as a team.
		Individuals interact in limited way and sometimes in teams but this is rarely effective and functional;	1		
		Individuals interact regularly and form teams, but this is not always fully effective or functional;	2		
		Individuals interact effectively and form functional teams	3		
5. Capacity to monitor, evaluate, report and learn	28. Protected area policy is continually reviewed and updated	There is no policy or it is old and not reviewed regularly;	0	**3**	PA institutions regularly review policies updating.
		Policy is only reviewed at irregular intervals;	1		
		Policy is reviewed regularly but not annually;	2		
		National protected areas policy is reviewed annually	3		
	29. Society monitors the state of protected areas	There is no dialogue at all;	0	**2**	Public can get certain information through some specific websites and flyers with information that are allowed to be publicized in line with applicable administrative policies and bylaws.
		There is some dialogue going on, but not in the wider public and restricted to specialized circles;	1		
		There is a reasonably open public dialogue going on but certain issues remain taboo;	2		
		There is an open and transparent public dialogue about the state of the protected areas	3		
	30. Institutions are highly adaptive, responding effectively and immediately to	Institutions resist change;	0	**2**	PA institutions can make appropriate adjustment in accordance to contextual changes.
		Institutions do change but only very slowly;	1		
		Institutions tend to adapt in response to change but not always very effectively or with some delay;	2		

Annex 2: Capacity Development Scorecard – Hainan Marine and Fisheries Department

Strategic Area of Support	Issue	Outcome Indicators	Score:		Evaluative Comments
	change	Institutions are highly adaptive, responding effectively and immediately to change	3		
	31. Institutions have effective internal mechanisms for monitoring, evaluation, reporting and learning	There are no mechanisms for monitoring, evaluation, reporting or learning;	0	**3**	National-level PAs have established some kind of mechanism.
		There are some mechanisms for monitoring, evaluation, reporting and learning but they are limited and weak;	1		
		Reasonable mechanisms for monitoring, evaluation, reporting and learning are in place but are not as strong or comprehensive as they could be;	2		
		Institutions have effective internal mechanisms for monitoring, evaluation, reporting and learning	3		
	32. Individuals are adaptive and continue to learn	There is no measurement of performance or adaptive feedback;	0	**3**	Superficial evaluation conducted but rarely fed back to improve future performance.
		Performance is irregularly and poorly measured and there is little use of feedback;	1		
		There is significant measurement of performance and some feedback but this is not as thorough or comprehensive as it might be;	2		
		Performance is effectively measured and adaptive feedback utilized	3		
TOTAL SCORE			**96**	**71**	
				74%	

Annex 3. Ecosystem Health Index – Overview and Baselines for Dongzhaigang NNR, Qinglangang PNR and Xinying Mangrove NWP

A Brief Summary of the Ecosystem Health Index (EHI) Methodology

Definition: Ecosystem Health is taken to be the suitability of a site to continue to provide secure conditions for survival of component species and delivery of key ecological services, including resilience to climate and other changes.

Objective: EHI is a not an evaluation. It is a dynamic, constantly varying index that reflects biodiversity health, just as a financial index reflects economic performance.

- EHI provides a baseline against which targets for maintaining or achieving a given level of health can be set
- EHI can be used as a results based indicator of project achievement and impacts
- EHI can indicate where the project is succeeding or failing and allow revision of activity efforts throughout the project
- EHI is complementary to the Management Effectiveness Tracking Tool (METT) in project monitoring and evaluation.

Introduction: Ecosystem health is reflected in the ability of a site to maintain its biodiversity values and ecological functions. These will vary significantly from site to site. The index developed to assess this health has three components: 1) score of habitat suitability for maintaining important biodiversity; 2) status of that biodiversity and 3) the broader environmental context. The score does not necessarily indicate stability. Many wetland sites are very dynamic but what we are interested in is the ability of the biota to adapt to or even thrive with the changes. This will become increasingly important as climate and water flow patterns change. A simple scoring system is recommended to give the results transparency and robustness. Each site using this index should undertake a baseline survey which also selects indicators and target species for subsequent surveys. Indicators should include key wetland birds, important aquatic fauna – fish, molluscs; selected indicator insects; endangered mammals; major components of vegetation; incidence of Alien Invasive Species (AIS).

The index establishes a snapshot value at the time of surveying; can relate present scores against baselines established at an earlier date, identifying trends in the different indicators; and can establish reasonable targets for improvement for each different indicator, and compare current state against identified targets.

While a human body may appear healthy in not showing much physical deterioration, we can identify several indicators of lifestyle that certainly constitute health threats (excessive drinking and smoking habits, lack of sleep, lack of inoculation, living in a region of known diseases, poor hygiene habits, lack of medical facilities, etc.). In the same way, we can recognize several threats to ecosystem health in the external context that may not be immediately reflected in the condition of habitat or status of species. Such indicators include the levels of external

development threats, the level of secure legal protection, and the level of human use pressures being applied or expected in the future.

Use of the EHI Scoresheet

1. Establish the monitoring team

Should include manager, ecologist, consultant, local experts and if possible local community member(s).

2. Classify and map the main habitat types

The scoring of the habitat sub-index requires assessing whether the extent, diversity, connectivity and condition of key habitats is maintained. For this it is necessary to classify, map, and measure the extent and status of specific habitats. For ease of work and subsequent analysis it is recommended to use a simple hierarchical habitat classification. An example for Poyang Lake is given below but it is not important to follow any formal classification system and use of whatever classification is already used by management or researchers in the area is usually adequate. If no suitable classification is already in use, it is recommended to follow the classification system of Wetlands International (see the Asian Wetlands Inventory Handbook[74]) for wetland types. For terrestrial vegetation, use classifications in current use at local level. Google maps can be downloaded from the internet and provide a basis for mapping different recognizable vegetation formations. These can then be compared with later imagery to monitor changes in distribution. Use of GIS is useful but not essential. Once mapped, the area of habitat types can be calculated by counting dots on transparent sheets. Retain maps and results for future comparisons.

Suggested habitat classification and hierarchy

(example only; not comprehensive for China[75]!)

Ist Order	2nd Order	3rd Order	4th Order
Water bodies	Natural Fresh water	Lakes	Open Lake
			Shallows
			Small Lake
		Rivers	Large River
			Small River
	Artificial	Ponds	Reservoir
			Small Pond
Terrestrial	Barren	Sparse vegetation	Beach
			Mudflats
		No natural vegetation	Bare Land
			Urban area
	Arbour	Woodlands	Willows
			Poplar plantation
			Mixed plantations

[74] Finlayson CM, Begg GW, Howes J, Davies J, Tagi K & Lowry J. 2002. A Manual for an Inventory of Asian Wetlands: Version 1.0. Wetlands International Global Series 10, Kuala Lumpur, Malaysia.

[75] For instance, marine and coastal wetland types are unrepresented except for "beach and mudflats".

			Natural mixed forest
		Scrub	Scrub
	Herbaceous	Marshes	Reed-beds
			Lotus-beds
		Grasslands	Miscanthus meadow
			Phalaris meadow
			Carex meadow
			Artemesia meadow

3. Identify main threats to be monitored

- Key threats have already been identified for each project area at the PIF stage. These were reviewed at PPG stage.
- Additional threats can be tagged for attention when local teams are assembled or if unpredicted changes occur during the project cycle. There should be a good match between indicator species selected and the specific threats they indicate.

4. Identify suitable indicator species to be monitored

- Conservation target species (note - rarely seen species give little data)
- Commoner species that are sensitive to habitat quality – amphibia, dragonflies, birds
- Easily identified – large mammals
- Easily quantified (harvest levels of fish, crabs etc. or plants)
- Alien species of concern

5. Undertake baseline measurements

This will involve checking in the field, examining plans, maps and other documents, interviewing managers and local community members and undertaking status assessments of selected indicator species (this latter task should be incorporated into routine monitoring activities but baselines need to be established).

6. Calculate baseline indices

Pick the score for each indicator that best meets your observations. Most important is to complete the notes explaining on what basis this score was selected and listing the requirements that should be targeted by the project for improving this score. Identification of areas where improvement can be expected is the key to calculating the target index score that the project can realistically hope to achieve.

7. Periodically repeat measurements (minimum would be mid-term and end of project). Routine monitoring of indicator species should be more often than this and at least twice per year.

8. Analyze observed changes in relation to established targets

Note changes in relation to baseline or previous evaluations

9. Report results and feed into project planning revisions

Append full notes, maps, tables of scored species, or any data on human uses and activities, tourism entries etc. on which the answers were based. This is important as the next team to evaluate may be different and will need to see the basis for determining whether conditions are changing or getting worse.

It is recommended that the first 6 steps should have expert assistance, but local teams can undertake subsequent monitoring and scoring independently.

The EHI scorecard

The EHI scorecard is designed for simplicity and robustness. Different teams should reach similar scores. In our training exercises, robustness was tested. Five independent scorers reached almost identical scores for Dongzhaigang NNR (mangroves) in Hainan and 6 different teams scored almost identical scores for Jiulongshan NNR (forest) in Hubei. Team members do not require high levels of literacy, biological knowledge or statistical skills. The EHI scorecard is designed to match and augment the Management Effectiveness Tracking Tool (METT) being used in GEF Biodiversity projects and can be filled out at the same time.

At national level, SFA should monitor EHI scores of focal sites, other wetland sites within project provinces and a selection of sites not directly affected by the project as part of overall monitoring of conditions and programme impacts.

3.1 A HAINAN-DONGZHAIGANG MANGROVE NATIONAL NATURE RESERVE

Name of Site: Hainan Dongzhaigang National Nature Reserve	**Wetland Ecosystem Health Index (EHI) Score sheet**			**Scored by (names): John MacKinnon, Wang Wenqing, Zhong Cairong, Chen He, and Chen Wei**	**Date completed: Jul. 27, 2012**
Issue	**Criteria**	**Score: tick only one box per question**		**Comment/explanation**	**Target to improve?**
Component 1. Habitat Health Assessment					
Habitat connectivity	Habitats severely fragmented by inhospitable barriers	0		Sea connects but land ward forests lost and fringe mangroves round coast destroyed	Restore network of fringe mangroves
	Habitats fragmented but some connections or corridors remain	1	1		
	Habitats partly fragmented	2			
	Habitats enjoy good connectivity	3			
Habitat heterogeneity	Site composed of only one major habitat	0		Less habitat types, mangrove patches degraded	Encourage further natural restoration; artificial restoration introduced at certain areas if needed, e.g., Luofudun Island
	Site contains only a small proportion of full range of regional wetland habitats	1	1		
	Site contains most of regional representative habitats	2			
	Site contains mosaic of all representative habitats of regional wetland type	3			
Original habitat diversity retained	Range of original habitats severely reduced by habitat losses and changes	0		Original habitats well represented but formations disturbed; fringe habitats destroyed, habitats for wild boars almost disappeared	Allow nature to restore zonal bands; if necessary, artificially restore destroyed
	50-80% of original habitats still well represented	1			
	>80% of original habitats still well represented	2	2		
	Full range of original habitats all well represented	3			

					landward forests
Habitats degraded	Most habitats severely degraded in structure, composition or productivity	0		Site has history of serious degradation (large-scale tree-cutting for fuel woods, foreshore reclamation. Not yet restored to original conditions. Mangroves by tidal creeks are degrading due to disease and insects.	Reduce natural and artificial disturbances (in particular pollution, disease and insects) to allow natural regeneration and extension of surviving mangroves
	Some habitats severely degraded	1	1		
	Minor habitat degradation	2			
	All habitats in healthy natural condition	3			
Water pollution	Water toxic causing death of fish, mollusks and other biota, presence of toxic algae or plankton	0		Marine seas polluted by leakage of waste from aquaculture farms, state farms as well as domestic sewage.	Promote environmentally-friendly aquaculture and halt landward sources of pollution
	Water visibly dirty or smelly, surface scum visible	1			
	Slight discoloration, smell or cloudiness apparent	2	2		
	Water remains clear and potable	3			
Sediment load	Water seriously loaded with erosion sediments	0		Sea is cloudy with landbourne sediments, contaminants from aquaculture, agriculture and sanitary sewage	Encourage reforestation to reduce soil erosion and promote environmentally-friendly aquaculture to reduce pollution
	Water opaque, cannot see bottom of ponds, streams	1	1		
	Water fairly clear but contains significant sediment	2			
	Sediment levels entirely normal	3			
Oxygen levels	Severe hypoxia kills fish and mollusks	0		Eutrophication of sea caused by surrounding fishing farms potentially contributes to lower oxygen levels	Promote environmentally-friendly aquaculture to reduce pollution
	Some signs of hypoxia, fish gulping at surface	1			
	Oxygen levels close to natural original figures	2	2		
	Oxygen levels remain at natural healthy levels	3			

Water supply	Water supply and water table seriously modified and damaging ecological functions	0		Overuse of underground water for daily life and aquaculture use and climate change influence water supply	Adequately use of surface water to save underground water resources
	Water supply modified by major diversions, drainage or extractions	1	1		
	Water supply peaks (droughts and floods) exaggerated by regional changes in flow	2			
	Water supply remains in original seasonal pattern	3			
Physical disturbance (construction, fish traps, barrages, noisy activity)	Site is transformed by artificial developments, structures or disturbances	0		Extensive erection of nets and traps, former construction of dam (established by water resources management bureau to prevent tide), sound pollution of boats, tourist activities, as well as intensive fishing ponds	Strengthen management to reduce assorted physical disturbance, develop alternative livelihood, e.g., eco-tourism to reduce local communities' reliance on the resources in the reserve
	Site faces much disturbance from construction and disturbance	1	1		
	Minor structures or disturbances only	2			
	Original physical state preserved	3			
Disaster damage	Ecology irreversibly modified by natural or artificial disaster	0		Mangroves are quite dynamic so recovery rate to any natural and human-induced disasters should be quick. Although typhoons have not influenced the mangroves in the site seriously, typhoons would pose a significant and increasing risk of natural damage under climate change, coupled with rising	Maintaining wide range of habitats and species will increase resilience accordingly
	Serious disasters frequent and ecological recovery period long	1			
	Severity and frequency of disasters increased through human activities but ecology shows high recovery rate	2	2		
	Frequency of disasters remains natural, capacity to recover remains high	3			

				sea levels.	
Design resilience (size,altitude,NS axis,lithology,dynamics,multiple catchments)	Site is too small, isolated and homogeneous to offer ecological resilience	0		Site is small and mangroves are fragmented as well as far away from other mangrove forests, will be vulnerable to defending environmental changes and disasters.	Reestablish mangrove network by restoring destroyed or disappeared mangroves
	Site is naturally vulnerable to change	1	1		
	Site enjoys moderate resilience design	2			
	Site enjoys natural high resilience	3			
Sub-total of habitat health risks		**Sum score**	**15**	**% of total maximum: 45.5%**	**Index (HI) =0.455**
Component 2. Species Health Assessment					
Health of target species	All target species show declines	0		Monitoring indicates general declines and a few of species are locally extinct, e.g., otter.	Good protection will reverse this trend. For instance, to strengthen management to facilitate regeneration and to create more suitable habitats, if appropriate, and to improve water quality
	Most target species show declines	1	1		
	Some target species show declines	2			
	All target species stable or increasing	3			
Health of vertebrate indicator species	All indicator species show declines	0		Monitoring indicates majority species declines	Same as above
	Most indicator species show declines	1	1		
	Some indicator species show declines	2			
	All indicator species stable or increasing	3			
Health of invertebrate indicator species	All indicator species show declines	0		Monitoring indicates general declines	Same as above
	Most indicator species show declines	1	1		
	Some indicator species show declines	2			
	All indicator species stable or increasing	3			

Health of plant indicator species	All indicator species show declines	0		Monitoring indicates general declines and some species, *Barringtonis racemosa*, is hard to find in the reserve.	Same as above
	Most indicator species show declines	1			
	Some indicator species show declines	2	2		
	All indicator species stable or increasing	3			
Species diversity retained	Richness of faunal/floral communities irreversibly depleted	0		Human-induced disturbance, overexploitation and habitat change contribute to the declines of some species, e.g., richness of bird species decreased from 78 in 1998 to 65 in 2010, and richness of mangrove species declined from 35 in 1998 to 33 in 2010.	Same as above
	Significant gaps appearing in reporting of local species	1	1		
	Minor reductions in species richness noticed	2			
	Site retains full original species diversity with high proportion of locally potential species	3			
Highest trophic carnivores still present	No high trophic carnivores remain at site	0		Only few carnivorous mammals exist, e.g., large raptors (rare), scavenger (kites) (common), junior sharks (species need to identify)	To attract return of large raptors by reinforcing management as well as creating suitable habitats
	Few carnivores remain at site	1	1		
	Some high trophic carnivores lost from local fauna	2			
	All high trophic carnivores or original fauna still present	3			
AIS resilience	AIS out of control and permanently replacing some local species	0		Some AIS are recorded and have not seriously jeopardized local species	To reduce expansion of exotic mangrove species deliberately introduced and conduct monitoring on existing AIS
	AIS degrading ecosystem functions or displacing local species	1			
	Some AIS noticed at site but not seriously damaging ecosystem or local species	2	2		
	No AIS established in site, adequate measures in place to prevent invasion	3			
Breeding/winteri	High mortality on wintering/breeding areas of site	0		The survival of some	Good protection

ng success of target species	Survival of some species a concern	1	1	species worries the reserve due to serious human disturbance and food shortage	will provide a safer and resourceful habitat for target species. The reserve will erect nets surrounding main breeding sites to prevent local villagers from these habitats.
	Moderate survival	2			
	Key species all surviving well at site	3			
Key new species using site	Total species no. dropping over time	0		Species richness stable. Few new species added, e.g., Oriental Plover *Charadrius veredus,* greylag goose *(Anser anser).*	Good protection is to provide suitable environment for new species
	No new species recorded but species richness stable	1	1		
	Some new species (other than AIS) noted	2			
	No. of new colonizing species exceed local extinctions	3			
Economic harvest species (legal and illegal)	Uncontrolled overharvesting eliminating some species	0		Species with economic values all shows reduced abundance due to overharvesting	To promote sustainable harvest by conducting co-management to develop alternative livelihood (e.g., ecotourism), prohibiting using net with fine mesh size
	Harvesting results in serious declines in several species	1	1		
	Harvesting results in minor declines of some species	2			
	No harvesting, or harvesting appears entirely sustainable	3			
Mortality/disaster of key species (fires, droughts,	Disasters have caused irreversible or long term declines to important species	0		Some disasters seriously damaged some species, e.g., large-scale death of	To improve capacity for responding to
	Disasters have caused serious damage to	1	1		

floods, diseases)	important species			mangrove along tidal creeks due to outbreak of disease and insects. In addition, cold wave in 2008 caused patchy death of few mangrove species	disasters, reinforce conservation of rare and endangered species to avoid extinction of these species and to establish a in-situ garden to reserve rare and endangered species at Daoxue Protection Station
	Disasters cause minor damage to some species	2			
	No diseases, disasters in recent years or species recovery fast and complete	3			
Sub-total of species health risks		**Sum score**	**13**	**% of total maximum 39.4%**	**Index (SI) = 0.394**
Component 3. Environmental Context Health Assessment					
Site boundaries and zones	Adequate boundaries not clearly marked or respected	0		Boundaries delineated clearly on map and part of boundaries marked in field and some boundaries unmarked. Unluckily, villagers usually ignore the existence of boundary markers in field	Lay more boundaries markers with notice boards and publicize local villagers by conduction special campaigns
	Boundaries inadequate or not respected	1			
	Some boundaries marked, partially respected	2	2		
	Effective boundaries, zones in place and marked	3			
Legal framework	No legal protection for site	0		Suffer from general weakness of applicable regulations and bylaws, e.g., Regulations on Nature Reserve in China and Hainan Mangrove Protection Regulations, in	To strengthen regulations by introduction of specific site level regulations for protection of site and strengthen
	Weak legal protection or protection for only part of site	1			
	Legal status assured but some weaknesses remaining	2	1		
	Strong legal security and law enforcement procedures in place	3			

				particular prevent various resources extraction exploited by local governmental agencies and local communities from the site	law enforcement
Tourism impacts	Tourism uncontrolled and causing serious damage and disturbance to site	0		Tourism confines to the experimental zone of the site but tourism levels make some negative impacts in terms of littering, boat spilling, and noise disturbance	To develop a good tourism plan and confine tourism to the peripheral and/or experimental zone of the site; to reinforce supervision and management on tourist numbers
	Some controls in place but tourism exceeds safe carrying capacity	1			
	Tourism controlled by causing some negative impacts	2	2		
	Tourism absent or well controlled and within safe limits	3			
Human resource use pressures	Pressure on natural resources of site out of control	0		Pressure from local communities' activities are very high in the site	To mitigate pressure by demonstrating and promoting alternative livelihoods
	High levels of collection or use of renewable resources	1	1		
	Low levels of pressure for resources or land-use (e.g. grazing)	2			
	No human pressure on resources, or pressures now contained by alternative livelihood program	3			
Additional threats or stresses from external developments (existing or planned)	Water diversion plans, dams, drainage would completely change nature of the site	0		Health affected by coastal developments, reclamation, dam construction, aquaculture (including but not limited to fishing farms), and human settlements	To guide local communities to develop environmentally friendly aquaculture and to set specific zones to buffer external threats
	External developments negatively affect the ecosystem of site	1	1		
	Low risk or low impacts can be absorbed by ecosystem	2			
	No threats from external developments	3			

Local community relations	Local community alienated and oppose establishment of protected area on site	0		There is a rather high level of conflict between local communities wishes to utilize site and management wish to protect it	To establish a harmony relationship with local communities through co-management and demonstration of alternative livelihoods
	Local community accept existence of protected area but neutral and mostly not involved	1	1		
	Local community enjoy some benefits through employment or alternative livelihoods	2			
	Local communities strongly supportive; respect protected area and collaborate in protection, reporting work	3			
Sub-total of environmental context health risks		**Sum score**	**10**	**% of total maximum 55.6%**	**Index (CI) = 0.556**
Overall EHI score (HI+SI+CI)/3 =(0.455+0.394+0.556)/3= 0.468		**Date of baseline: 27 July 2012**		**Target identified for project**	**0.600**

Annex 3.1B: EHI Monitoring Protocol for Dongzhaigang

Name of Nature Reserve	Dongzhaigang Mangrove National Nature Reserve	**Date Established:** January, 1980	**Management Agency:** Hainan Dongzhaigang Mangrove National Nature Reserve Management Bureau	**Size of NR (ha):** 3337	Size of Core/Buffer (ha): 1635/1167.1
Date of Baseline: 1998		**Date of EHI scoring:** Jul. 27, 2012	**Scoring Team:** John MacKinnon, Wang Wenqing, Zhong Cairong, Chen He, and Chen Wei	**EHI Scores: 0.468**	

Schedule for Biodiversity Monitoring					
Name/Taxon	**Baseline Status**	**Method for Monitoring**	**Timing**	**Trends/Threats**	**Comments**
Target Species					
Osprey	Uncommon winter visitor	Total count	whenever sighted	Lack of perch or nesting trees	
Heritiera littoralis Aiton	Rare mangrove tree	Map each tree	annual		
Black-faced spoonbill	Uncommon winter visitor	Total count	whenever sighted	Declining	
Pisodonophis boro Rice Paddy Eel	Rare carnivorous fish	Sampling count	annual		
Barringtonia sp.	Rare associate tree of beach forests	Map each tree	annual		

Indicator Species					
Vertebrate Indicators					
Name/Taxon	**Baseline Status**	**Method for Monitoring**	**Timing**	**Trends/Threats**	**Comments**
Chinese pond heron	Common resident with colonial breeding site	Count nests and fledgling success from observation post	Spring, summer, autumn	Stable	
Common kingfisher	Occasional around coastal and on fish ponds	routine patrol sightings	routinely	Shortage of nesting banks	
Common greenshank	Resident and winter and passage migrant	Flock estimates from selected sample sites at low tide	weekly	Stable	
Little Egret	Common resident	Total counts from selected sample points at low tide	weekly	Declining	
Mudskippers	Common on healthy mud bars	Map areas with good populations	weekly	Declining	
Fish catch	Extensive harvesting	Sample fishermen catch	monthly	Declining	
Invertebrate Indicators					
Shrimps	Common, many species harvested	Question sample of fishermen	Monthly harvest		
Crabs	Common, many species harvested	Question sample of fishermen	Monthly harvest		
Mollusks	Common, many species harvested	Question sample of fishermen	Monthly harvest		
Dragonflies	Common and many species present	Record numbers and species of 2 families from moth trap	Weekly all year		
Plant Indicators					

Mangroves	Several formations	Map by type	Annual		
Lumnitzera racemosa	Rare type	Map by type	Annual		
Casuarina formation	beach Associate, limited habitat	Map by type	Annual		

Alien Invasive Species					
Name/Taxon	**Baseline Status**	**Method for Monitoring**	**Timing**	**Trends/Threats**	**Comments**
Bengal mangrove	Artificially introduced to several parts of reserve	Map planted areas, check natural spread	Annual	halt planting	
Tilapia	Increasingly common	Fisherman statistics/proportion of catch	Monthly	increasing	
False Zebra mussels	Found in drains and canals	Check ditches and drains	Annual check	To be determined after consulting with specialists or conducting relevant research	
Cultivated oysters	Extensively farmed on posts in bay	Map plus fisherman statistics	Annual	increasing	
Human Activities					
Duck farms	Several fenced areas and some free ranging	Map and estimate bird numbers	Annual		
Oyster beds	Extensive within bay	Map and calculate production	Annual		
Ponds	encroaching into reserve in some sectors	Map	Annual		
Boats moored	Varies with weather	routine patrols	routinely		
Nets /traps erected	Some nets, thousands of accordion traps	Map and counts	routinely		

Routine Patrolling (Vary timings and routes, use patrol form)					
Rare and interesting sightings			weekly		
Indicator species			weekly		
Habitat condition			weekly		
Other human use			weekly		
Visitor Use					
Daily visitor numbers		Maintain daily records	Report weekly totals		
Visitor income		Maintain daily records	Report weekly totals		
Visitor facilities		Annual inventory	Each autumn		

Physical Parameters					
Name/Taxon	**Baseline Status**	**Method for Monitoring**	**Timing**	**Trends / Threats**	**Comments**
Climate details		Maintain records	standard recordings summed/average by month		
Water measurements		temp, oxygen, sediment load	monthly		
Pollution		note evidence, share data with EPB			Ideally should be targeted at specific problems that would be determined in the 1st year of project implementation– e.g. pollution from aquaculture and sewage (maybe ammonia, BOD, bacteria counts?); visual evidence of oil pollution

3.2 QINGLANGANG PROVINCIAL NATURE RESERVE

Name of Site: Qinglangang Provincial Nature Reserve	**Wetland Ecosystem Health Index (EHI) Score sheet**		**Scored by (names): Wang Wenqing, John MacKinnon, Zhong Cairong**	**Date completed: Jul. 28, 2012**
Issue	**Criteria**	**Score: tick only one box per question**	**Comment/explanation**	**Target to improve?**
Component 1. Habitat Health Assessment				
Habitat connectivity	Habitats severely fragmented by inhospitable barriers	0	Sea connects but landward forests lost and fringe mangroves round coast destroyed. Mangroves are fragmented within the site.	Restore some aquaculture ponds to mangroves
	Habitats fragmented but some connections or corridors remain	1	1	
	Habitats partly fragmented	2		
	Habitats enjoy good connectivity	3		
Habitat heterogeneity	Site composed of only one major habitat	0	All habitats exists but transitional habitats between terrestrial and coastal ecosystems destroyed	Return aquaculture ponds to mangroves
	Site contains only a small proportion of full range of regional wetland habitats	1		
	Site contains most of regional representative habitats	2	2	
	Site contains mosaic of all representative habitats of regional wetland type	3		
Original habitat diversity retained	Range of original habitats severely reduced by habitat losses and changes	0	Areas with intensive distribution of shrimp ponds, fish ponds and etc. degraded seriously, while other areas preserved well	Restore aquaculture ponds to mangroves and reduce the intensity of human disturbance
	50-80% of original habitats still well represented	1	1	
	>80% of original habitats still well represented	2		
	Full range of original habitats all well represented	3		
Habitats degraded	Most habitats severely degraded in structure, composition or productivity	0	Some areas are difficult to restore due to serious	Reduce human

	Some habitats severely degraded	1	1	damage from human activities	disturbance, in particular pollution and harvest intensity
	Minor habitat degradation	2			
	All habitats in healthy natural condition	3			
Water pollution	Water toxic causing death of fish, mollusks and other biota, presence of toxic algae or plankton	0		Aquaculture contaminates seawater. In addition, domestic sewage and agricultural run-off further deteriorate water quality.	Halt resources of pollution, promote environmentally friendly aquaculture, establish sewage treatment farm in Wencheng
	Water visibly dirty or smelly, surface scum visible	1			
	Slight discoloration, smell or cloudiness apparent	2	2		
	Water remains clear and potable	3			
Sediment load	Water seriously loaded with erosion sediments	0		Sea is unclear due to sewage discharge and landborne sediments	Reduce soil erosion by afforestation and mitigate pollution through promoting environmentally friendly aquaculture
	Water opaque, cannot see bottom of ponds, streams	1			
	Water fairly clear but contains significant sediment	2	2		
	Sediment levels entirely normal	3			
Oxygen levels	Severe hypoxia kills fish and mollusks	0		Some signs of hypoxia at some sections of water system due to disconnection and pollution	Restore natural hydrological regime
	Some signs of hypoxia, fish gulping at surface	1			
	Oxygen levels close to natural original figures	2	2		
	Oxygen levels remain at natural healthy levels	3			
Water supply	Water supply and water table seriously modified and damaging ecological functions	0		Upstream sluice, coastal levees and road	Almost impossible to

	Water supply modified by major diversions, drainage or extractions	1		construction impose influence on water supply.	remove these barriers resulting from acts of government. In the future, if appropriate, the site might propose inserting culverts through levees and under roads to mitigate serious impacts.
	Water supply peaks (droughts and floods) exaggerated by regional changes in flow	2	2		
	Water supply remains in original seasonal pattern	3			
Physical disturbance (construction, fish traps, barrages, noisy activity)	Site is transformed by artificial developments, structures or disturbances	0		Extensive erection of nets and traps, coastal levees, tourist activities as well as infrastructure development	Regulate infrastructure development, reinforce management and guidance on sustainable harvest of sea products
	Site faces much disturbance from construction and disturbance	1	1		
	Minor structures or disturbances only	2			
	Original physical state preserved	3			
Disaster damage	Ecology irreversibly modified by natural or artificial disaster	0		Mangroves under pressure of anthropogenic threats are subject to extreme weather, e.g., storms and sea level rise.	Good protection to mitigate anthropogenic damage and restore natural formation of
	Serious disasters frequent and ecological recovery period long	1			
	Severity and frequency of disasters increased through human activities but ecology shows high recovery rate	2	2		

	Frequency of disasters remains natural, capacity to recover remains high	3			mangroves; climate change adaptation measures determined and implemented
Design resilience (size, altitude, NS axis, lithology, dynamics, multiple catchments)	Site is too small, isolated and homogeneous to offer ecological resilience	0		The site is small and is damaged to some extent. However, the site with rich diversity of species and habitats embraces a good resilience.	Return aquaculture ponds to mangroves and encourage natural resilience of mangroves
	Site is naturally vulnerable to change	1			
	Site enjoys moderate resilience design	2	2		
	Site enjoys natural high resilience	3			
Sub-total of habitat health risks		**Sum score**	**18**	**% of total maximum=54.5%**	**Index (HI) =0.545**
Component 2. Species Health Assessment					
Health of target species	All target species show declines	0		Monitoring indicates some species declines	Encourage natural restoration; take active intervention measures if necessary
	Most target species show declines	1	1		
	Some target species show declines	2			
	All target species stable or increasing	3			
Health of vertebrate indicator species	All indicator species show declines	0		Monitoring indicates some species declines	Same as above
	Most indicator species show declines	1			
	Some indicator species show declines	2	2		
	All indicator species stable or increasing	3			
Health of invertebrate indicator species	All indicator species show declines	0		Monitoring indicates some species declines	Same as above
	Most indicator species show declines	1	1		
	Some indicator species show declines	2			

	All indicator species stable or increasing	3			
Health of plant indicator species	All indicator species show declines	0		Monitoring indicates some species declines	Same as above
	Most indicator species show declines	1			
	Some indicator species show declines	2	2		
	All indicator species stable or increasing	3			
Species diversity retained	Richness of faunal/floral communities irreversibly depleted	0		Some species declines due to habitat loss, intensive exploitation of fishery resources and pollution	Same as above
	Significant gaps appearing in reporting of local species	1	1		
	Minor reductions in species richness noticed	2			
	Site retains full original species diversity with high proportion of locally potential species	3			
Highest trophic carnivores still present	No high trophic carnivores remain at site	0		A few carnivorous mammals use the site, e.g., otter under pressure of poaching and large raptors	Same as above
	Few carnivores remain at site	1	1		
	Some high trophic carnivores lost from local fauna	2			
	All high trophic carnivores or original fauna still present	3			
AIS resilience	AIS out of control and permanently replacing some local species	0		AIS are mainly distributed along mangrove edges. The recorded AIS include *Lantana camara, Eupatorium odoratum, and Lpomoea cairica.*	Use native species when restoring mangroves, strictly control the introduction of AIS, strengthen monitoring the expansion of AIS on the mangrove edges and manual removal of
	AIS degrading ecosystem functions or displacing local species	1			
	Some AIS noticed at site but not seriously damaging ecosystem or local species	2	2		
	No AIS established in site, adequate measures in place to prevent invasion	3			

					AIS if necessary
Breeding/wintering success of target species	High mortality on wintering/breeding areas of site	0		Wintering habitats for waterbirds are being seriously disturbed due to increasing tourists	Reinforce patrolling efforts, and set up fences to safeguard key nesting and reproducing habitats for waterbirds
	Survival of some species a concern	1	1		
	Moderate survival	2			
	Key species all surviving well at site	3			
Key new species using site	Total species no. dropping over time	0		Species richness stable but no new species recorded according to very limited available information	Conduct inventory of species and monitor their dynamics
	No new species recorded but species richness stable	1	1		
	Some new species (other than AIS) noted	2			
	No. of new colonizing species exceed local extinctions	3			
Economic harvest species (legal and illegal)	Uncontrolled overharvesting eliminating some species	0		Species declines due to overharvest	Regulate fish close season, fishing facilities (including nets and traps), no-take sites, allowable harvest species, and etc.
	Harvesting results in serious declines in several species	1	1		
	Harvesting results in minor declines of some species	2			
	No harvesting, or harvesting appears entirely sustainable	3			
Mortality/disaster of key species (fires, droughts,	Disasters have caused irreversible or long term declines to important species	0		No visible disaster impacts on mangroves and associated species	Improve structures of mangroves is
	Disasters have caused serious damage to	1			

floods, diseases)	important species			observed, but their impacts get escalating year by year. Expected increase typhoon intensity and frequency and sea level rise due to climate change are likely to increase disaster impacts in future.	the optimal conservation measure to fight against disasters
	Disasters cause minor damage to some species	2	2		
	No diseases, disasters in recent years or species recovery fast and complete	3			
Sub-total of species health risks		**Sum score**	**15**	**% of total maximum 45.5%**	**Index (SI) = 0.455**
Component 3. Environmental Context Health Assessment					
Site boundaries and zones	Adequate boundaries not clearly marked or respected	0		Pressures from dense population and economic development make the boundaries exist in name only	To set up boundary pillars/markers and notice boards by cooperating with other relevant governmental sectors, e.g., land resources management bureau
	Boundaries inadequate or not respected	1	1		
	Some boundaries marked, partially respected	2			
	Effective boundaries, zones in place and marked	3			
Legal framework	No legal protection for site	0		Legal status is clear and Hainan Mangrove Protection Regulations provide legal safeguard for the reserve. The site suffers the weakness of the regulation that is hard to be implement on the ground	Strengthen law enforcement, and strive for support of local people's congress to enact a site-level
	Weak legal protection or protection for only part of site	1			
	Legal status assured but some weaknesses remaining	2	2		
	Strong legal security and law enforcement procedures in place	3			

					regulation; community awareness programmes on regulations and values of mangroves would help to law compliance
Tourism impacts	Tourism uncontrolled and causing serious damage and disturbance to site	0	0	Tourism development is chaos, e.g., boardwalk intersects mangrove patch with the best mangrove community compositions and structures.	Re-formulate tourism plan and relocate the location of board walks, service stations, fishing sites, and "agritainment" sites; restore destroyed mangroves due to incompatible tourism
	Some controls in place but tourism exceeds safe carrying capacity	1			
	Tourism controlled by causing some negative impacts	2			
	Tourism absent or well controlled and within safe limits	3			
Human resource use pressures	Pressure on natural resources of site out of control	0		Disorder exploitation, overharvest and intensive aquaculture are prevalent due to the deficiency of sustainable resources management	Return aquaculture ponds to mangroves, restrict harvest of sea products
	High levels of collection or use of renewable resources	1	1		
	Low levels of pressure for resources or land-use (e.g. grazing)	2			
	No human pressure on resources, or pressures now contained by alternative livelihood program	3			

					scientifically, promote community co-management and awareness measures to facilitate above strategies' implementation
Additional threats or stresses from external developments (existing or planned)	Water diversion plans, dams, drainage would completely change nature of the site	0		Hydrological regime greatly changed due to large-scale development and construction	Regulate development and construction activities rationally; strengthen broader inter-sectoral cooperation, EIA capacity building and guidance on development practices
	External developments negatively affect the ecosystem of site	1	1		
	Low risk or low impacts can be absorbed by ecosystem	2			
	No threats from external developments	3			
Local community relations	Local community alienated and oppose establishment of protected area on site	0		Local communities have a good knowledge of mangrove forests in preventing and mitigating natural disasters and have developed village	Regulate and guide tourist activities and provide alternative livelihoods to
	Local community accept existence of protected area but neutral and mostly not involved	1	1		
	Local community enjoy some benefits through employment or alternative livelihoods	2			

	Local communities strongly supportive; respect protected area and collaborate in protection, reporting work	3		regulations on mangrove conservation and utilization. However, there is an increasing level of conflicts between local communities' wishes to utilize site and management wish to protect it.	improve relationship with local communities
Sub-total of environmental context health risks		**Sum score**	**6**	**% of total maximum =33.3%**	**Index (CI) =0.333**
Overall EHI score (HI+SI+CI)/3 =(0.545+0.455+0.333)/3= 0.444		**Date of baseline: 28 July 2012**		**Target identified for project**	**0.600**

3.3 XINYING MANGROVE NATIONAL WETLAND PARK

Name of Site: Xingying Wetland National Park	**Wetland Ecosystem Health Index (EHI) Score sheet**		**Scored by (names): Zhong Cairong, Chen Wei, Chen He**	**Date completed: Jul. 29, 2012**
Issue	**Criteria**	**Score: tick only one box per question**	**Comment/explanation**	**Target to improve?**
Component 1. Habitat Health Assessment				
Habitat connectivity	Habitats severely fragmented by inhospitable barriers	0	Internally fragmented by shrimp farms and other types of mariculture (e.g., crabs, seaweed, etc.)	Replace unproductive shrimp farms with mangroves to restore integrity of ecosystems
	Habitats fragmented but some connections or corridors remain	1		
	Habitats partly fragmented	2		
	Habitats enjoy good connectivity	3		
Habitat heterogeneity	Site composed of only one major habitat	0	Remain almost all representative habitats but some mangroves degraded with slow recovery, in particular key waterbirds breeding habitats	Further conserve to facilitate natural restoration with appropriate artificial restoration; avoid further introduction of AIS
	Site contains only a small proportion of full range of regional wetland habitats	1		
	Site contains most of regional representative habitats	2		
	Site contains mosaic of all representative habitats of regional wetland type	3		
Original habitat diversity retained	Range of original habitats severely reduced by habitat losses and changes	0	Main original habitats retained good, some patches disturbed and degraded	Facilitate natural restoration with appropriate artificial restoration
	50-80% of original habitats still well represented	1		
	>80% of original habitats still well represented	2		
	Full range of original habitats all well represented	3		
Habitats	Most habitats severely degraded in structure,	0	Habitats degraded due to	Expand

degraded	composition or productivity			aquaculture practices	mangrove coverage by mitigating human-induced disturbance and contamination, and advancing restoration
	Some habitats severely degraded	1	1		
	Minor habitat degradation	2			
	All habitats in healthy natural condition	3			
Water pollution	Water toxic causing death of fish, mollusks and other biota, presence of toxic algae or plankton	0		In addition to domestic sewage and agricultural run-off, sea water dominantly polluted by aquaculture	Promote environmentally friendly aquaculture
	Water visibly dirty or smelly, surface scum visible	1			
	Slight discoloration, smell or cloudiness apparent	2	2		
	Water remains clear and potable	3			
Sediment load	Water seriously loaded with erosion sediments	0		Sea is feculent with landborne sediments, contaminants from aquaculture, agriculture and sanitary sewage	Reduce soil erosion via afforestation and mitigate pollution by introducing environmentally friendly aquaculture, and sewage treatment for villages
	Water opaque, cannot see bottom of ponds, streams	1	1		
	Water fairly clear but contains significant sediment	2			
	Sediment levels entirely normal	3			
Oxygen levels	Severe hypoxia kills fish and mollusks	0		No visible oxygen depletion observed but eutrophication resulting from intensive aquaculture farms might cause oxygen depletion	Mitigate pollution by introducing environmentally friendly aquaculture and sewage
	Some signs of hypoxia, fish gulping at surface	1			
	Oxygen levels close to natural original figures	2	2		
	Oxygen levels remain at natural healthy levels	3			

					treatment
Water supply	Water supply and water table seriously modified and damaging ecological functions	0		Artesian wells function well but climate change might negatively act on water supply	Effectively use of surface water to less rely on underground water
	Water supply modified by major diversions, drainage or extractions	1			
	Water supply peaks (droughts and floods) exaggerated by regional changes in flow	2	2		
	Water supply remains in original seasonal pattern	3			
Physical disturbance (construction, fish traps, barrages, noisy activity)	Site is transformed by artificial developments, structures or disturbances	0		Massive human disturbance, including extensive erection of nets and traps, tidal-flat aquaculture	Reduce physical disturbance through good conservation. Recommend local government to develop ecotourism to weaken the dependency on natural resources of the park
	Site faces much disturbance from construction and disturbance	1	1		
	Minor structures or disturbances only	2			
	Original physical state preserved	3			
Disaster damage	Ecology irreversibly modified by natural or artificial disaster	0		Mangroves are quite dynamic so recovery rate to any natural and human-induced disasters should be quick	Maintain environmental stability, reduce human disturbance, and enhance natural resilience
	Serious disasters frequent and ecological recovery period long	1			
	Severity and frequency of disasters increased through human activities but ecology shows high recovery rate	2	2		
	Frequency of disasters remains natural, capacity to recover remains high	3			
Design resilience (size,altitude,NS	Site is too small, isolated and homogeneous to offer ecological resilience	0		The site is too small to respond to environmental	Reestablish mangrove

axis,lithology,dynamics,multiple catchments)	Site is naturally vulnerable to change	1	1	changes and extreme disasters	network
	Site enjoys moderate resilience design	2			
	Site enjoys natural high resilience	3			
Sub-total of habitat health risks		**Sum score**	**16**	**% of total maximum=51.5%**	**Index (HI) =0.485**
Component 2. Species Health Assessment					
Health of target species	All target species show declines	0		Species general declines due to aquaculture and associated pollution as well as overharvest	Good conservation will reverse this trend through habitat rehabilitation and regulation on harvest activities
	Most target species show declines	1	1		
	Some target species show declines	2			
	All target species stable or increasing	3			
Health of vertebrate indicator species	All indicator species show declines	0		Same as above	Same as above
	Most indicator species show declines	1	1		
	Some indicator species show declines	2			
	All indicator species stable or increasing	3			
Health of invertebrate indicator species	All indicator species show declines	0		Same as above	Same as above
	Most indicator species show declines	1	1		
	Some indicator species show declines	2			
	All indicator species stable or increasing	3			
Health of plant indicator species	All indicator species show declines	0		Same as above	Same as above
	Most indicator species show declines	1			
	Some indicator species show declines	2	2		
	All indicator species stable or increasing	3			
Species diversity retained	Richness of faunal/floral communities irreversibly depleted	0		Richness of species and abundance of species declined due to human disturbance, in particular overexploitation.	Reinforce protection to facilitate regeneration, habitat
	Significant gaps appearing in reporting of local species	1	1		
	Minor reductions in species richness noticed	2			

	Site retains full original species diversity with high proportion of locally potential species	3		According to a recent incomplete survey, the recorded richness of waterbirds dropped from 24 species in 2005 to 8 species in 2011.	rehabilitation if necessary
Highest trophic carnivores still present	No high trophic carnivores remain at site	0		Some large-sized raptors exist	Manage habitats to prepare well for the return of raptors
	Few carnivores remain at site	1	1		
	Some high trophic carnivores lost from local fauna	2			
	All high trophic carnivores or original fauna still present	3			
AIS resilience	AIS out of control and permanently replacing some local species	0		AIS presents but has not seriously jeopardized native species	Avoid introduction of AIS, monitoring AIS, and proactively prevent pressures from AIS
	AIS degrading ecosystem functions or displacing local species	1			
	Some AIS noticed at site but not seriously damaging ecosystem or local species	2	2		
	No AIS established in site, adequate measures in place to prevent invasion	3			
Breeding/wintering success of target species	High mortality on wintering/breeding areas of site	0		Survival of some species is a concern due to food shortage resulting from serious human disturbance	Reinforce protection, reduce human disturbance, improve habitat quality to insure food supply
	Survival of some species a concern	1	1		
	Moderate survival	2			
	Key species all surviving well at site	3			
Key new species using site	Total species no. dropping over time	0		Species richness retains stable, a few new species added to species inventory	Better protect habitats to attract more new species
	No new species recorded but species richness stable	1	1		
	Some new species (other than AIS) noted	2			
	No. of new colonizing species exceed local extinctions	3			
Economic harvest	Uncontrolled overharvesting eliminating some	0		Economic species	Promote the

species (legal and illegal)	species			declined due to overharvest	concept of sustainable utilization by proposing local government to conduct ecotourism to lessening intensive resources' exploitation
	Harvesting results in serious declines in several species	1	1		
	Harvesting results in minor declines of some species	2			
	No harvesting, or harvesting appears entirely sustainable	3			
Mortality/disaster of key species (fires, droughts, floods, diseases)	Disasters have caused irreversible or long term declines to important species	0		Some species seriously threatened due to disasters	Enhance capacities to respond to various disasters
	Disasters have caused serious damage to important species	1	1		
	Disasters cause minor damage to some species	2			
	No diseases, disasters in recent years or species recovery fast and complete	3			
Sub-total of species health risks		**Sum score**	**13**	**% of total maximum 39.3%**	**Index (SI) = 0.393**
Component 3. Environmental Context Health Assessment					
Site boundaries and zones	Adequate boundaries not clearly marked or respected	0		Boundaries clearly defined on maps (master plan), no boundary markers laid, local villagers ignore the boundaries	Lay boundary markers and notice boards, strengthen promotion on boundary management; promote community co-management and awareness of local
	Boundaries inadequate or not respected	1	1		
	Some boundaries marked, partially respected	2			
	Effective boundaries, zones in place and marked	3			

					villagers
Legal framework	No legal protection for site	0		Suffer from the weakness of legal regulations (a provincial-level regulation in place)	Ameliorate relevant regulations，increase understanding of these regulations via promotion campaigns, reinforce law enforcement
	Weak legal protection or protection for only part of site	1			
	Legal status assured but some weaknesses remaining	2	2		
	Strong legal security and law enforcement procedures in place	3			
Tourism impacts	Tourism uncontrolled and causing serious damage and disturbance to site	0		No tourism exists	To prevent any incompatible ecotourism activities from the site
	Some controls in place but tourism exceeds safe carrying capacity	1			
	Tourism controlled by causing some negative impacts	2	2		
	Tourism absent or well controlled and within safe limits	3			
Human resource use pressures	Pressure on natural resources of site out of control	0		Tremendous pressures resulted from strong dependency on natural resources in the site	To develop alternative livelihoods to weaken certain pressures
	High levels of collection or use of renewable resources	1	1		
	Low levels of pressure for resources or land-use (e.g. grazing)	2			
	No human pressure on resources, or pressures now contained by alternative livelihood program	3			
Additional threats or stresses from external developments (existing or planned)	Water diversion plans, dams, drainage would completely change nature of the site	0		Aquaculture, tidal prevention levees as well as reclamation activities threatened the site	To weaken negative influences of varied human activities, including
	External developments negatively affect the ecosystem of site	1	1		
	Low risk or low impacts can be absorbed by ecosystem	2			

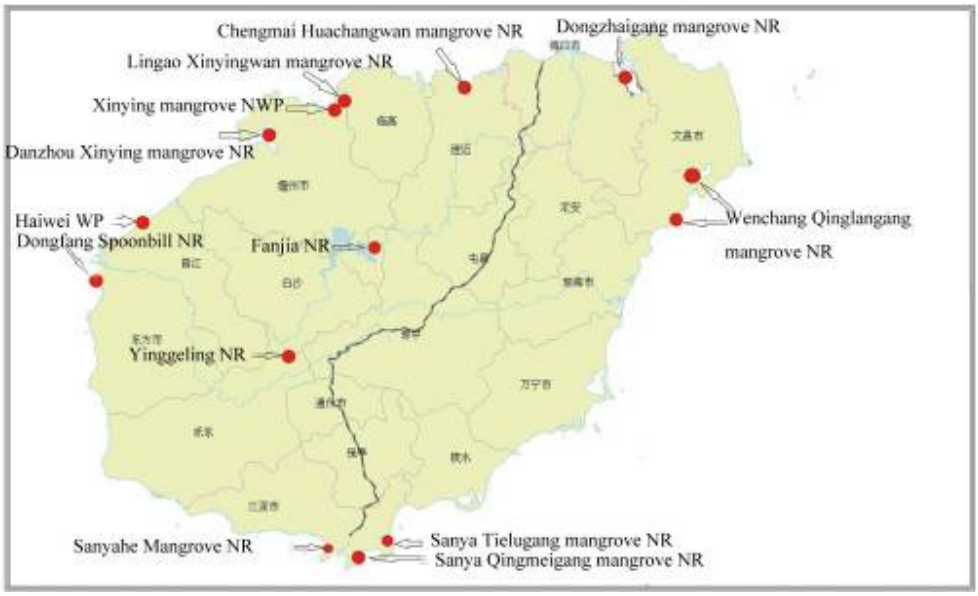
	No threats from external developments	3			promoting environmentally friendly aquaculture, setting aside buffering areas
Local community relations	Local community alienated and oppose establishment of protected area on site	0		There is a rather high level of conflict between local communities wishes to utilize site and management wish to protect it	Encourage involvement of local communities, provide alternative livelihoods to improve partnership with local communities
	Local community accept existence of protected area but neutral and mostly not involved	1	1		
	Local community enjoy some benefits through employment or alternative livelihoods	2			
	Local communities strongly supportive; respect protected area and collaborate in protection, reporting work	3			
Sub-total of environmental context health risks		**Sum score**	**8**	**% of total maximum = 44.4%**	**Index (CI) = 0.444**
Overall EHI score (HI+SI+CI)/3 = (0. 485+0. 393+0. 444) /3 =0.441		**Date of baseline 29 July 2012**		**Target identified for project**	**0.600**

Annex 4. Site profiles for mangrove PA network sites and table of national and provincial level protected areas in Hainan

4.1 SITE PROFILES FOR HAINAN MANGROVE PROTECTED AREA NETWORK

There are more than a dozen wetland NRs or wetland parks (WPs) on Hainan Island (see map below). The coastal sites for the GEF project demonstration were selected according to their significance for biodiversity conservation, value in demonstrating responses to different types of threats, current conservation status, levels of public awareness and participation in nature conservation, and potential for improvement. They include six coastal wetland nature reserves and one national wetland park, whose major characteristics are listed below.

Wetland Reserves and Wetland Parks in Haihan Island



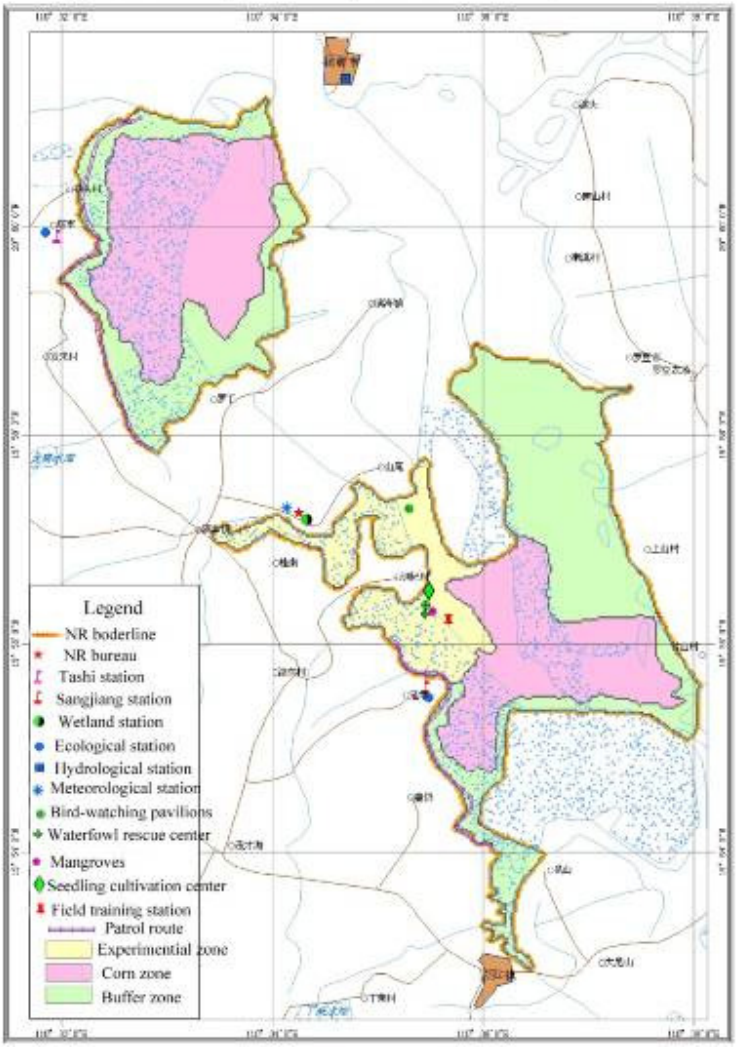
1. Hainan Dongzhaigang National Nature Reserve

(1) Basic information

Hainan Dongzhaigang NNR is located in Haikou, northeast part of Hainan island (19°51′-19°01′N, 110°32′-110°37′E), with a coastline of 84 km. It is surrounded by the Luodou Farm of Wenchang City, and Sanjiang Farm, Sangjiang town and Yanfeng town of Haikou city. As a Ramsar site, Dongzhaigang NNR manages 3,337.6 ha of coastal area to protect mangrove wetland ecosystems with 194 bird species, 35 mangrove species, 115 fish species as well as 129 molluscs. Detailed information on three management zones of Dongzhaigang NR is as follows:

Management zone	Location	Forest area (ha)	Mudflat and shallow sea area (ha)	Total area (ha)	% of total area
Core zone	Tashi, Sanjiang	749.7	885.3	1635	48.99
Buffer zone	Tashi, Sanjiang	442.1	725.0	1167.1	34.97
Experimental zone	Sanjiang	386.3	149.2	535.5	16.04
Total		1578.1	1759.5	3337.6	100.00

FIGURE 7. MASTER PLAN OF DONGZHAIGANG NNR



Dongzhaigang NNR is the country's first national level mangrove ecosystem reserve. Since its establishment, a lot of effort has been put on mangrove seedling cultivation and introduction with remarkable results. Therefore this nature reserve is considered as the most important site for mangrove research nationwide. However, climate change, overfishing, increasing pollution from aquaculture and tourism, facilities construction (e.g., roads and bridges), and pest outbreaks as well as diseases are collectively jeopardizing the biodiversity and ecosystems in the reserve.

（2）Ecological environment

Dongzhaigang NR is dominated by mangroves, but contains some fish and shrimp ponds, and small areas of *Phragmites* wetlands, grasslands and *Casuarina* (Australia pine) forests. Under the influence of monsoonal climate, the soil of local terrestrial lands is typical Lateritic clay, with a depth of 1~1.5m, pH of 5~6 and rich organic matter. Except for saline sandy loam in the fringe mangrove forests, most soils in the estuarine delta are swamp soils, with pH values of 3.5~7.5 (most time lower than 5.0), which are characterized with high water content, high salinity, large quantity of hydrogen sulphide, and oxygen depletion.

Dongzhaigang NR is located within Zhangzhai Bay, which is Hainan Island's largest bay with a total area of 10,000 ha and also the youngest bay with a history of only around 400 years. With humid and warm weather, plentiful rainfall brings about 700 million m^3 water to the bay from four major rivers including Yinzhou river, Sanjiang river, Yangfendong river and Yangfengxi river.

There are 24 species (from 12 families) of true mangroves and 11 species of semi-mangrove (from 9 families). Approximately 95% of Chinese mangrove species can be found in the reserve and some of them are rare species, including *Sonneratia hainanensis*, *Nipa fruticans, Lumnitzera littorea,* just to name a few. The main mangrove formations in the reserve include *Bruguiera gymnorrhiza* community, *B. sexangula* community, *Ceriops tagal* community, *Avicennia marina* community, *Kandelia obovata* community, *Rhizophora stylosa* community, *N. fruticans* community, *Acrostichum aureaum* community, *Aegiceras corniculatum* community, *L. littorea* community, *R. stylosa+ C. Tagal* community, *C. Tagal+A. corniculatum* community, *Sonneratia+ Kendelia* community, and *Pongamia pinnata* community.

According to multi-year records, 194 species of birds have been recorded in the reserve, including nationally rare or globally endangered species such as Black-faced Spoonbill (*Platalea minor*), Greater Coucal (*Centropus sinensis*) and Saunder's Gull *Larus saundersi*. Amphibian species found in the reserve include *Rhacophorus megacephalus*, *Rana limnocharis*, *Calotes versicolor*, etc., while the reptile species are mainly snakes. Common mammals include tree squirrels, Hainan giant squirrels, Red-bellied squirrels, and dog bats (*Cynopterus sphinx*). There are also 129 species of molluscs (shellfish), 115 species of fish (from 53 families), of which eels, groupers and snappers are marine fishes of high commercial value.

（3）Social and economic status

A total of 4,122 households and 18,200 residents live around the nature reserve. The average income per capital is at 630-870 USD per year, mainly from fishing for aquatic animals, aquaculture and crop (mainly rice) cultivation. Men are usually responsible for fishing and aquaculture activities, while women take the responsibility of seafood selling in local markets (90%), fishing and aquaculture (30%), and rice cultivation and household chores (almost 100%).

As a unique landscape of the tropics, mangrove forests have great value for tourism and recreation. Local government plans to establish mangrove wetland parks, mangrove peninsula resorts, and other facilities around the reserve for tourism industry, which aims at reducing destructive effects to Dongzhaigang NR from aquaculture pollution through promoting economic development via tourism business.

（4）Management capacity

Dongzhaigang NR Bureau currently has 40 permanent staff plus 6 temporary helpers, which are administrated by one director and one deputy director. Among them, one holds a Ph.D degree, 13 had undergraduate education and 7 had junior college education. The bureau includes an administrative office, department of research and monitoring, department of education, department of community co-management, department of forest protection, plus three field stations (Sanjiang station, Tashi station, Daoxue station). In addition, there is a police station

within the reserve, which is administered by the Bureau of Forest Police, HFD. The main duty of this police station is to protect the ecological resources of Dongzhaigang NR.

The main equipment and facilities available currently at Dongzhaigang are listed below:

Equipment or facility	Unit	Quantity	Equipment or facility	Unit	Quantity
Administrative building（two）	㎡	1300	Telephone	set	2
Office building at Sanjiang Station	㎡	450	Laptop	set	9
Office building at Tashi Station	㎡	450	Stationary PC	set	10
Office building at Daoxue Station	㎡	900	Printer	set	2
Museum	㎡	1300	Copier	set	1
Dormitory	㎡	2510	Digital camera	set	13
Patrol port		1	GPS	set	5
Bird observatory		1	Monocular	pair	3
Patrol boat		3	Binoculars	pair	6
Vehicle		4	Electronic balance	set	1
Motorcycle		15			

(5) Major threats

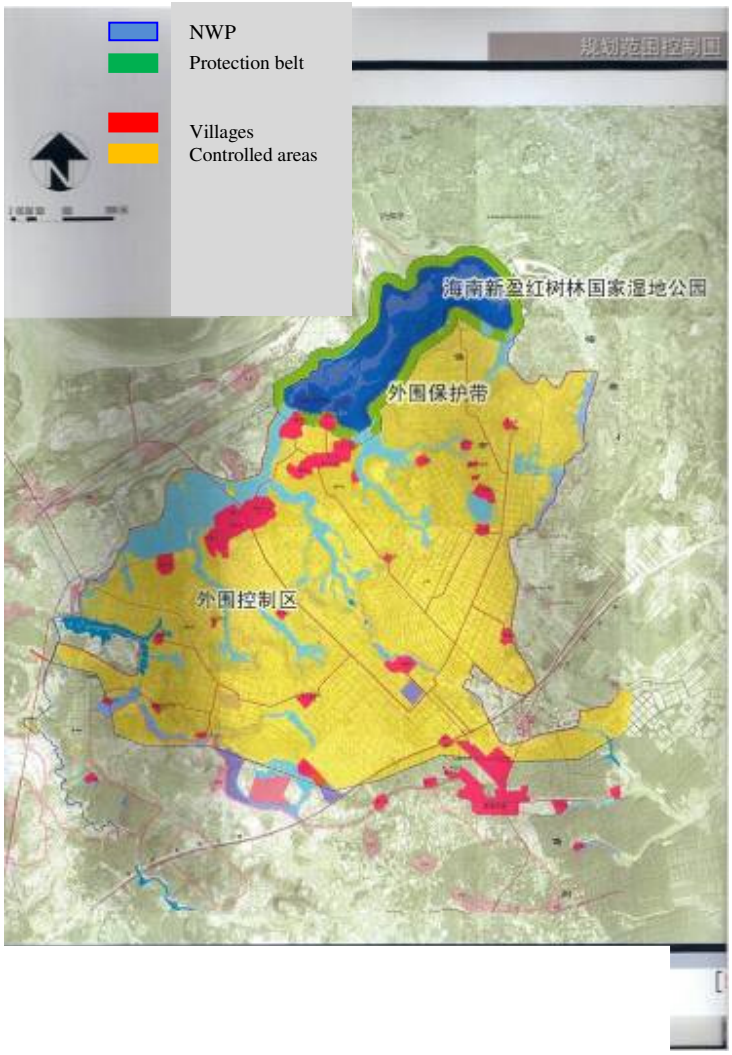
The biggest threat to the biodiversity of Dongzhaigang NR is the overexploitation of marine resources, which resulted in increasing reduction in both species and density of marine animals. The local residents near the reserve depend mainly on fishing inside the reserve for their livelihood. Too many fishermen and the small mesh size of fishing nets are main reasons for the great reduction in marine animal resources. In addition, untreated wastewater discharges from more than 126 ha shrimp ponds inside the reserve and 533 ha shrimp ponds near the reserve, plus wastewater from pig farms nearby, cause serious degradation of water quality in the Dongzhaigang harbor.

2. Xinying National Wetland Park (NWP):

(1) Basic information

Located in Bochao harbor of northwesten Hainan (19°43′ 08′ ’N~19°51′ 48′ ’N, 109°28′ 12′ ′ -109°38′ 00′ ′ E), Xingying national wetland park was established in 2005 originally as an national marine forest park. In 2007, it was converted into national wetland park, which is now under the management of Danzhou Xilian Farm Corpporation. The park just planned their management zonation to further screen well-preserved mangroves for human—induced impacts while improving those mangrove habitats under degradation and disturbance. Xilian Farm Corporation is working closely with Hainan government agencies to develop the wetland park for ecological protection, scientific research, public education, tourism and recreation. The location and zoning of Xinying NWP are shown in the following map:

Annex 4: Site profiles for MPAN sites & Table of national and provincial level PAs in Hainan



(2) Ecological environment

Xinying NWP covers 507 ha with 150-ha mangrove forest along the coastline to save the serious threatened mangrove forest. *Rhizophora stylosa, Kandelia candel, Bruguiera gymnorrhiza, Bruguiera sexangula, Ceriops tagal, Aegiceras corniculatum, Avicennia marina, Excoecaria agallocha, Acanthus ilicifolius, Lumnitzera racemosa* and *L. littorea* can be easily found in the park. The remaining mangrove wetlands (268 ha) are, however, seriously degraded (ca. 102 ha) and disturbed (ca. 45 ha). The park is home to 18 mangrove species and more than 70 bird species, including globally endangered Black-faced Spoonbills (more than 14 seen in the 2011-2012 winter) and nationally rare Greater Coucal.

(3) Social and economic status

There are two villages with a population of 1500 residents in the park, with 900 residemts in Dongyang Village and 600 residents in Dunji Village. The main incomes of local residents include aquaculture, rice cultivation and seafood collection on the mudflats. Annual income per capita is about 3000 RMB (US$476) per month, including governmental subsidy of 115 RMB (US$18) per mu for rice cultivation and about 50 RMB (US$8) per day income from seafood collections. In order to improve family living conditions, about 60% of young residents go to Guangdong seeking for labor work there.

(4) Management power

As requested, a management station was established for Xinying NWP, with 4 administrative staff and 6 patrollers. Their salary and other compensations come mainly from the government funds set for protecting public forests, which currently is at the level of 300 RMB (US$48) per ha.

(5) Major threats

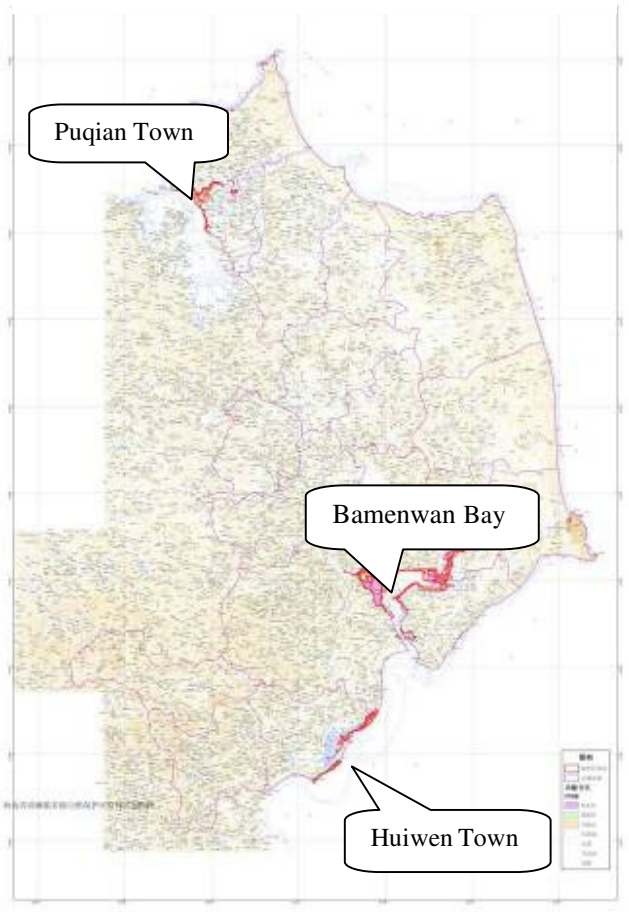
The main threats to Xinying NWP include: (1) Discharge of domestic sewage and agricultural pesticides: The main economic activities of local residents, e.g., aquaculture, contribute a lot to the degradation of the habitats in the park. In addition, pollution from runoff of agricultural pesticides and domestic sewage also deteriorate the quality of the site. There is no sufficient fund to establish wastewater treatment facility for controlling pollution; (2) Human activities: the intensive activities of local residents have a serious impact on migratory birds including Black-faced Spoonbills; and (3) Aquaculture: There are 92 shrimp ponds in Dangyang Village and 37 shrimp ponds in Dunji Village, which together occupy 2800 mu (or 180 ha) coastal wetlands. Wastewater and polluted sediments from shrimp ponds are discharged directly into the park without proper treatment, which impose serious threats to mangroves, benthic animals and the birds feeding on them.

3. Qinglangang Provincial Nature Reserve (Qinglangang PNR)

(1) Basic information

Located in Wenchang city (19º15′-20º09′N, 110º30′-110º02′E), the Qinglangang provincial nature reserve was established in 1981 with an area of 2,904.5 ha encompassing coastlines, mangrove forests and mudflats. It contains three parts, Bamenwang Bay, Huiwen Town and Puqian Town. The Bamenwang Bay section contains the best patches of mangrove stands located in Qinglang, Wencheng, Touwan, Dongge, Wenjiao, Dongjiao and Longlou. The mangrove forests in the Huiwen Town section face directly towards the South China Sea and are affected seriously by waves and strong winds. The mangrove forests in the Puqian Town section are connected with those in Dongzhaigang National Nature Reserve, but are in much smaller quantity. The three sections of Qinglangang PNR are shown in the map below.

Map showing three locations of Qinglangang PNR



(2) Ecological environment

Mangrove forests are the main wetlands in Qinglangang PNR, accompanied by small areas of fish and shrimp ponds. The soils are mainly sandy loam with high content of sands. High contents of sediments occur only in Touwan area where the mangroves show the best growth and are much older. The local climate is quite mild, with high moisture and plenty of water supplies. In the Bamenwang section where the mangroves are most concentrated, two rivers enter the bay and bring large quantity of freshwater, which lowers the salinity of this region.

The reserve conserves the largest, most diverse and most pristine mangrove forest in Hainan Province. There 35 species of mangroves (about 90% of all mangrove species in China), belonging to 22 genera and 16 families. The old-growth mangrove forest with 172 vascular plants also provides suitable habitats for animals. Incomplete statistics show that 117 bird species, 25 butterflies, more than 300 fish species and 218 macro-zoobenthic species co-exist in the site. About 23.3% of the birds are listed in the list of Sino-Japan Migratory Birds Protection Agreement and 29.9% of birds listed in the Sino-Australia Migratory Bird Protection Agreement can be observed in the reserve.

(3) Social economic status

The population of Wenchang City is about 530,000 now, with an urban population of 65,000 (in Wencheng Town). The main economic activities of Wenchang City include commercial and service industries. Qinglangang PNR is surrounded by 7 towns and 1 farm, with 97 villages and 28,780 residents. The local residents living inside or nearby the reserve depend mainly on nearshore fishing or aquaculture for their living, with annual per capita income of 3,800 RMB (US$603), of which 50% comes from fishing, 20% from aquaculture, 10% from agriculture, and 20% from other activities such as commercial and labor services. There is relatively little differentiation of male and female roles in economic activities. Since 2010, the government owned Wenchang Tourism Company has invested in the development of mangrove eco-tourism by building a green-walkway inside Bamenwang Bay mangrove wetlands, which is open to the public without charge. Local residents are allowed to set up trade shops, game fishing, farmer-experience restaurants and sight-seeing boats as new sources of income.

(4) Management power

Qinglangang PNR is managed by the Forestry Bureau of Wenchang City, which is under the direct supervision of Hainan Forestry Department. There are 15 official staff positions, filled currently by 14 members, including 2 managers, 6 technical staff and 6 workers. Five police officers work in the Wenchang Mangrove Police Station, which is a part of Forest Police Bureau of Hainan Province. In addition, there are 12 permanent forest patrollers for Qinglangang PNR. Four field stations were set up to be in charge of specific region protection, including Touwan Station, Puqian Station, Dongge Station and Huiwen Station. The administrative bureau of Qinglangang PNR consists of (a) Group of Personnel and Finance; (b) Group of Research, (c) Group of Law Enforcement and (d) Group of Internal Affairs.

The operational budget for the Qinglangang PNR comes from Hainan Finance Department, Hainan Forestry Department, Wenchang Finance Bureau and Forestry Bureau of Wenchang City. The Phase I construction was just completed with total investment of 6.97 million RMB (US$1.11 million), of which 5.45 million RMB (US$865,000) was from central government. This includes the overall administration station in the north of Xuyugang Port (660 m^2), and the four field stations (327.5 m^2) at Yupuqianxu, Touwanxu, Donggexu and Huiwenxu, respectively. In addition, research laboratories, animal and plant specimen rooms and wildlife refuges have been also built to facilitate nature conservation, scientific monitoring and public education.

(5) Major threats

The long and narrow reserve straddles seven townships and one state farm, which makes the site exposed to intensive human-induced pressure from local communities, including fishing, aquaculture and burgeoning tourism. Overfishing, pollution from both domestic sewage and aquaculture increasingly jeopardize the diverse but fragile mangrove forest with the increasing population.

4. Dongfang Black-faced Spoonbill Provincial Nature Reserve (PNR)

(1) Basic information

Established in 2006, Dongfang Black-faced Spoonbill PNR is located in Sigeng Town of Dongfang city (19°11′33″～19°13′20″N, 108°37′24″～108°40′15″E). The 1,429 ha reserve was established to provide a safer refuge for the globally threatened Black-faced Spoonbill and

associated bird species. Natural mangroves dominated by *Avicennia marina* grow on the sheltered landward side of the beach barrier and are spreading naturally across the mudflats, providing cover for significant numbers of Great Egrets *Egretta alba*, Grey Herons *Ardea cinerea* and other species.

(2) Ecological environment

According to published information[76], January counts of Black-faced Spoonbills in Beili Bay from 2004 to 2009 inclusive are 51, 67, 75, 102, 118 and 125 respectively, accounting for some 7% of the total recorded population size of this species. Other rare waterbird species include Eurasian Spoonbill *Platalea leucorodia* and Asian Dowitcher *Limnodromus semipalmatus.* More than 70 waterbird species have been recorded here, e.g., , *Egretta alba, E. garzetta, Ardea cinerea, Tringa stagnatilis, T. nebularia, T. totanus, Limosa lapponica, Numenius arquata, Charadrius alexandrinus, and C. mongolus*.

(3) Social economic status

The reserve is also the dependence of two local communities with 3,438 inhabitants engaging in agricultural and aquaculture practices. Typical annual income is 20,000RMB/household. Women are involved in collecting seafood (except for driving boats) while men take outside jobs in the city like taxi driving. Crabs are caught in traps, and villagers both collect shellfish and even raise bivalves on the mudflats using small plastic enclosures. They "plant" the small shellfish and then grow them on as a small scale activity, currently fetching 10RMB/500g. Less than 20% of families are involved in aquaculture. Small-scale aquaculture is reportedly profitable, but the risk of disease is high for large scale ventures.

(4) Management power

The reserve has been divided into three zones: core zone, buffer zone, and experimental zone. The core area consists of 250ha mangroves and 160ha mudflats so 410ha in total. Some basic reserve establishment administrative tasks remain incomplete, affecting land ownership, staffing and budget for the reserve. There is no reserve management bureau building, with a rented room currently providing very basic office facilities. Staffing is currently four fulltime staff of the Dongfang Forestry Bureau, financed by an ongoing eco-forest project (central and provincial govt funds). These funds can also be used for equipment, office supplies, etc. The reserve has a video camera system set up for monitoring the site. There is a site patrol team, consisting of four local people, playing a largely preventative role. Public education work is important to support the reserve, which the reserve is currently doing to some extent. The site has good potential for birdwatching and casual visitors, which the reserve plans to enhance by constructing an observation tower in due course. There is also scope for other tourist facilities if access can be managed effectively. The reserve has already conducted mangrove replanting in aquaculture ponds (various species) and mudflats (transplanting wild *Avicennia* seedlings), and has plans to expand the replanting area.

[76] Zhang et al. 2010. Species abundance and conservation of coastal wintering waterbirds in Hainan Island, China. Chinese Birds 2010 1(3): 204-210. DOI 10.5122/cbirds.2010.0014

The Dongfang Forestry Bureau oversees natural resource management, local government is not involved, and there is no existing co-management. However, in 2013, a City level regulation will be issued on forest resource protection (for local implementation of the national Forest Protection Act) through which the Dongfang Forestry Bureau will work with local government on various aspects of forest protection including: fire prevention, reafforestation, participation of local government (eg township level) on these issues. Significantly, the destruction of coastal forest belt and other forest resources then becomes a responsibility of the local government. An MoU will be established to enforce the regulation.

(5) Major threats

Local residents' economic activities, e.g., catching seafood, aquaculture, and poaching, impose direct and indirect pressures to the Black-faced Spoonbills and waterbirds (which are sensitive to disturbance) and their habitats. Recently, a series of wind turbines were set up along the landward margin of Dongfang PNR, which should not have a significant negative impact on Black-faced Spoonbills and their mangrove habitats as they were set back from the foreshore following HFD intervention. Prickly pear cactus is invading the sandy strip between the aquaculture ponds and the lagoon flats (inside the reserve) as well as the coastal green belt further inland.

5. **Sanya City Nature Reserve**:

The Sanya NR cluster includes Qingmeigang NR (180°14′43″N, 109°36′36″E), Sanyahe NR (18°19′—18°37′N, 108°36′—109°46′E) and Tielugang NR (18°15′—18°17′N, 109°42′—109°44′E). The three local NRs are administered by Sanya City Forestry Bureau. Qingmeigang NR is co-governed by Sanya City Forestry Bureau and Yalongwan Limited Company. The Qingmeigang NR covers an area of 92.6 ha with patchy mangrove forest. The mangrove near the estuary area still contains some rare mangrove species including *Lumnitzera littorea*. The Qingmeigang is surrounding by high-end hotels. Real estate development, grazing and boating exert serious pressures on the habitats. Sanyahe NR is characterized by riparian mangrove dominated by *Rhizophora apiculata*. Sanyahe NR has restored about 7 ha mangrove forest through afforestation, and provides good habitat for riparian birds. Physical construction imposes serious threats to the site. Tielugang NR covers 292 ha area with 45 ha covered by forest, includings the oldest mangrove in China. Common mangrove species in this reserve include *Avicennia marina, Lumnitzera racemosa, and Xylocarpus granatum*. Due to funding shortage, a 3 ha mangrove area is under serious degradation.

Li minority villages occur around the mangrove PAs in Sanya. There is no distinct labour division among woman and men in terms of engaging in agriculture practice. They usually support each other by overseeing agricultural activities through taking turns to take different responsibilities.

6. **Danzhou Xinyingwan NR**:

This local nature reserve, which is adjacent to Xinying NWP, is located in Xinyingwan Bay of Danzhou City (19°42′~19°44′N, 109°10′~109°19′E), with tropical monsoon climate, annual precipitation of 1400~1600 mm, annual mean temperature of 23°C, tidal range of 1.5~2.0 m and

sandy sediments. Mangrove forests inside the reserve are dominated by *Rhizophora stylosa*, followed by *Bruguiera gymnorrhiza, Kandelia obovata, Ceriops tagal Aegiceras corniculatum, B. sexangula*, etc. Established in 1986 as a county level nature reserve with no baseline survey and no official application materials, there is still no official administration unit for this reserve, with only one permanent staff responsible for occasional patrols。However, the large area of *R. stylosa* forest is very unique in China, which requires more thorough surveys of their natural resources.

7. **Chengmai Huachangwan NR**:

Located in Chengmai County and established in 1995 as a county level mangrove nature reserve, this reserve is one of the few nature reserves administered by Hainan's Department of Marine Fisheries. It contains four major areas(109°59′10″E、19°54′30″N ; 109°59′20″E、19°54′40″N; 109°59′30″E、19°54′40″N ; and 109°59′35″E、19°54′20″N), with a total area of 15 ha. There is still no administrative unit for this reserve, so the daily operations are executed mainly by the officers of local bureau of marine fisheries. The mangroves inside the reserve are dominated by *Aegiceras corniculatum,* mixed with *Kandelia obovata, Rhizophora stylosa, Avicennia marina, Lumnitzera racemosa* and *Acrostichum aureum*. Most mangrove trees here are short, with tree height only around 0.8~2.5 m. The coastline around the reserve is more than 50 km, and it receives freshwater discharge from several rivers. The establishment of the reserve prevented the destruction of mangrove forests by local residents, and provided great locations for developing eco-aquaculture.

Annex 4: Site profiles for MPAN sites & Table of national and provincial level PAs in Hainan

4.2 TABLE OF NATIONAL AND PROVINCIAL LEVEL PROTECTED AREAS IN HAINAN

Nature Reserve	County	Area (ha)	Protection object	National / Provincial	Date of Establish-ment	Threats	Department	Staff (2009)
Dongzhaigang	Haikou city/ Qiongshan city/ Wenchang city	3337	Mangrove ecosystem	N	1980	Aquaculture/ fishery/ deforestation	Forestry Department	33
Tongguling	Wenchang city	4400	Coral reefs/ Tropical monsoon rain dwarf forest and wildlife	N	1983	Exploitation/ fishery/ global change	Environment and Resources Department	5
Sanya coral reefs	Sanya city	5568	Coral reefs	N	1990	Exploitation/ fishery/ global change	Ocean and Fisheries Department	20
Dazhoudao	Wanning city	7000	*Collocalia* (swiflets) and island marine ecosystem	N	1987	Development	Ocean and Fisheries Department	25
Datian	Dongfang city	1314	*Cervus eldii* and ecosystem	N	1976	Hunting/ reclamation/ deforestation	Forest Department	54
Bawangling	Changjiang Li Autonomous County / Baisha Li Autonomous County	29980	Hainan Black Crested Gibbon *Nomascus hainanus* and ecosystem	N	1980	Hunting/ reclamation	Forest Department	13
Jianfengling	Ledong Li Autonomous County	20170	Tropical monsoon forest	N	1976	Hunting/ deforestation/ reclamation/ burning	Forest Department	39
Diaoluoshan	Lingshui Li Autonomous County / Qiongzhong county/ Baoting county	18389	Tropical rainforest	N	1984	Hunting/ deforestation/ reclamation/ burning	Forest Department	15
Wuzhishan	Qiongzhong county/ Wuzhishan county	13435.9	Tropical virgin forest	N	1985	Hunting/ deforestation/ reclamation/ burning	Forest Department	48
Xisha Dongdao	Paracel Islands	100	Red-footed Booby *Sula sula* and ecosystem	P	1980	Hunting/ reclamation	Ocean and Fisheries Department	No data
Southwest Zhongsha Islands	Zhongsha Islands	2400000	Aquatic animals and plants and Coral reefs	P	1983	Fishery/ exploitation	Ocean and Fisheries Department	No data
Danzhou (*Pearl oyster*)	Danzhou city	25800	Pearl oyster (Pteriidae) and ocean	P	1983	Exploitation/ fishery/ global change	Ocean and Fisheries Department	10
Lingao (*Pearl oyster*)	Lingao country	38400	Pearl oyster (Pteriidae) and ecosystem/ Coral reefs	P	1983	Exploitation/ fishery/ global change	Ocean and Fisheries Department	4

Annex 4: Site profiles for MPAN sites & Table of national and provincial level PAs in Hainan

Wenchang (*Eucheuma muricatum*)	Wenchang city	6500	Marine algae *Eucheuma muricatum* / *Gracilaria sal icornia* and ecosystem	P	1983	Exploitation/ fishery/ global change	Ocean and Fisheries Department	13
Qionghai (*Eucheuma muricatum*)	Qionghai city	2500	Marine algae *Eucheuma muricatum* / *Gracilaria sal icornia* and ecosystem	P	1983	Exploitation/ fishery/ global change	Ocean and Fisheries Department	7
Huishan	Qionghai city	4462.4	Tropical monsoon forest	P	1981	Hunting/ deforestation/ reclamation/ burning	Forest Department	15
Ganshiling	Sanya city	1715.46	Endemic dipterocarp tree *Hopea exalata* etc.	P	1985	Deforestation/ reclamation/ burning	Forest Department	29
Qinglan	Wenchang city	2948	Mangrove ecosystem	P	1981	Aquaculture/ fishery/ deforestation	Forest Department	18
Jiaxin	Wanning city	7588	Tropical monsoon forest	P	19811	Hunting/ deforestation/ reclamation/ burning	Forest Department	10
Jianling	Wanning city	10898.7	Tropical monsoon forest	P	1981	Hunting/ deforestation/ reclamation/ burning	Forest Department	12
Liji	Wanning city	991.93	Dipterocarp tree *Vatica mangachapoi* forest and ecosystem	P	1980	Hunting/ deforestation/ reclamation/ burning	Forest Department	18
Liulianling	Wanning city	2745.47	Tropical monsoon forest	P	1981	Hunting/ deforestation/ reclamation/ burning	Forest Department	26
Nanlin	Wanning city	5775.26	Tropical monsoon forest	P	1981	Hunting/ deforestation/ reclamation/ burning	Forest Department	12
Shangxi	Wanning city	11662.2	Tropical monsoon forest	P	1981	Hunting/ deforestation/ reclamation/ burning	Forest Department	9
Dongfang	Dongfang city	1429	Black-faced Spoonbill *Platalea minor* and ecosystem	P	2006	Inshore fishing	Forest Department	No data
Mihouling	Dongfang city	12215.3	Tropical rainforest/ karst cave	P	2004	deforestation/ reclamation/ burning	Forest Department	No data
Baomeiling	Changjiang Li Autonomous County	3844.3	Tropical rainforest	P	2006	deforestation/ reclamation/ burning	Forest Department	No data
Jiaxi	Ledong Li Autonomous	8326.67	Tropical monsoon	P	1981	deforestation/ reclamation/	Forest Department	12

Annex 4: Site profiles for MPAN sites & Table of national and provincial level PAs in Hainan

	County		forest			burning		
Nanwan	Lingshui Li Autonomous County	1026	Rhesus macaque *Macaca mulatta* and ecosystem	P	1976	Hunting/ reclamation	Forest Department	88
Fanjia	Danzhou city	3100	Tropical monsoon forest	P	1981	deforestation/ reclamation/ burning	Forest Department	19
Bangxi	Baisha Li Autonomous County	361.8	Eld's Deer *Cervus eldii* and ecosystem	P	1976	Hunting/ reclamation	Forest Department	11
Limushan	Qiongchong Li Autonomous County	12889	Tropical monsoon forest	P	2004	deforestation/ reclamation/ burning	Forest Department	No data
Yinggeling	Qiongzhong/ Baisha/ Wuzhishan/ Ledong/ Baoting	50464	Tropical monsoon forest	P	2004	deforestation/ reclamation/ burning	Forest Department	No data

Annex 5: Project indicators – elaboration and results measurement table

Annex 5. Project Indicators – Elaboration and Results Measurement Table

<table>
<tr><th>INDICATOR</th><th>BASELINE</th><th>TARGET</th><th>MEASUREMENT</th><th>EXPLANATORY NOTES</th></tr>
<tr><td>At objective level</td><td colspan="4">To strengthen the management effectiveness of the wetland protected area system in Hainan in response to existing and emerging threats to the globally significant biodiversity and essential ecosystem services</td></tr>
<tr><td>1. The area of ecosystems covered by Hainan's terrestrial PA system increases by at least 40,000 ha with improved coverage of under-represented types by 2018 in line with the draft PA System Master Plan, project strategy and action plan for the wetland PA subsystem and climate change resilience strategy.</td><td>▪ Hainan's terrestrial PA system covers 285,600 ha (See inset table below for baseline areas)

<table><tr><th>Vegetation Type</th><th>Current (Km²)</th><th>Target (Km²)</th></tr><tr><td>32a[77]</td><td>7.6</td><td>15</td></tr><tr><td>33a</td><td>9.6</td><td>15</td></tr><tr><td>41a</td><td>8.5</td><td>15</td></tr><tr><td>43c</td><td>0</td><td>15</td></tr><tr><td>44</td><td>36.5</td><td>40</td></tr><tr><td>80b</td><td>1.5</td><td>5</td></tr></table>See Annex 10 for distributions</td><td>▪ Hainan's terrestrial PA system covers 325,600 ha (see inset table below for targets)</td><td>▪ Official Hainan Provincial government statistics and reports on the PA system by HFD, HLERD and HMFD.
▪ Surveying reports by Hainan Survey and cartography Department for HFD.</td><td>▪ The implementation of the draft Master Plan for Nature Reserves in Hainan Province (2011-2016) will be largely co-financed and coordinated by the responsible agencies with technical guidance and assistance from the project.
▪ The information on vegetation type coverage is now outdated, and should be updated during project implementation once the Hainan PA Master Plan has been approved and the Second National Wetland Inventory Assessment results are available.</td></tr>
<tr><td>2. Strengthened management effectiveness of 7 PAs in the Hainan</td><td>▪ Dongzhaigang NNR - 43
▪ Xinying NWP - 26
▪ Qinglangang PNR - 39
▪ Dongfang PNR - 45
▪ Sanya City NR[78] - 30</td><td>▪ 70
▪ 50
▪ 60
▪ 65
▪ 50</td><td>GEF BD1 METT assessments at:
▪ Baseline in PPG (2012)
▪ Midterm (2016)
▪ Project Completion</td><td>▪ As per GEF 5 BD1Outcome 1 Indicator 1.1: Protected area management effectiveness score as recorded by Management Effectiveness Tracking Tool.</td></tr>
</table>

[77] 32a Tropical semi-evergreen monsoon forest on laterite, 33a Tropical evergreen lowland forest, 41a Tropical acid shrub forest (Melastoma), 43c Tropical limestone forest, 44 Mangroves, 80b Tropical coastal savannah thorny forest. See **Annex 10** for distributions.

[78] A complex of three mangrove NRs: Sanyahe NR, Qingmeigang NR and Tielugang NR

Annex 5: Project indicators – elaboration and results measurement table

INDICATOR	BASELINE	TARGET	MEASUREMENT	EXPLANATORY NOTES
Mangrove PA Network indicated by METT scores.	▪ Xinying Bay City NR[79] 15 ▪ Huachang Bay CNR – 27	▪ 50 ▪ 50	(2018)	▪ See Annex 1 for METT Scorecard baselines
3. Planned improvement in the financial sustainability of the provincial PA system at site and system level indicated by Part II of the GEF financial sustainability scorecard: - Component 1 – Legal, regulatory and institutional frameworks - Component 2 – Business planning and tools for cost-effective management - Component 3 – Tools for revenue generation	31% 31% 11%	60% 56% 30%	GEF BD1 METT Financial Sustainability Scorecard assessments at: ▪ Baseline in PPG (2012) ▪ Midterm (2016) ▪ Project Completion (2018)	▪ As per GEF 5 BD 1 Outcome 1 Indicator1.2: *Funding gap for management of protected area systems as recorded by protected area financing scorecards.* ▪ This indicator takes the scores in Part II of the Financial Scorecard, expressing the current status of each component as a percentage of the total possible score (representing a fully functioning financial system at the site and system level). The target value represents the planned improvement in sustainable financing for the provincial PA system by the end of the project. ▪ See Annex 1 for Financial Scorecard baselines
At outcome 1 level	***Improved protection and management of Hainan's ecosystems through expansion, consolidation and sustainable financing of the provincial PA system***			
1. Financing Plan for the expanded PA system under Hainan Master	▪ Master Plan for Hainan PA System awaiting approval, no financing plan	▪ Financing Plan approved for the expanded PA system under Hainan Master Plan for the PA	▪ Official Hainan provincial government document indicating approval of the financing	▪ The Financing Plan will cover the expanded PA system under the Hainan Master Plan for the PA System including a strategic

[79] Overlaps with Xinying Mangrove NWP but separate administration

Annex 5: Project indicators – elaboration and results measurement table

INDICATOR	BASELINE	TARGET	MEASUREMENT	EXPLANATORY NOTES
Plan for the PA System including strategic plan for the wetland PA subsystem		System including strategic plan for the wetland PA subsystem	plan for the expanded PA system.	plan for the wetland PA subsystem to be developed by the project
2. National and provincial financing for PA system through HFD increased to close the existing annual financing gap of US$6.69 million for basic expenditure scenario	Annual financing available for PA System: US$ 8.06 million / year	Annual financing available for PA System + Projected annual financing gap for basic expenditure scenario in year 2011+5: US$19.92 million per year	▪ Financial scorecard assessments at: ▪ Baseline in PPG (2012) ▪ Midterm (2016) ▪ Project Completion (2018)	▪ See Annex 1 Financial Scorecard sheet for details: Line 105: existing annual financing gap for basic expenditure scenario; Baseline = Line 72 - existing annual financing available for PA System; Target = baseline (Line 72) + Line 116 (Projected annual financing gap for basic expenditure scenario in year 2011+5)
3. Improved PA system management capacity of Hainan Provincial Forestry Department, Environmental Protection Department and Oceanic Affairs Department as shown by the UNDP Capacity Scorecard	UNDP Capacity Development Scorecard baselines : ▪ HFD: 50% ▪ HLERD: 56% ▪ HMFD: 74%	UNDP Capacity Development Scorecard targets: ▪ HFD: 65% ▪ HLERD: 65% ▪ HMFD: 80%	UNDP Capacity Development scorecard assessments at: ▪ Baseline in PPG (2012) ▪ Midterm (2016) ▪ Project Completion (2018)	▪ UNDP Capacity Development scorecard. Note focus on HFD as NEA for this project, while EPD and OAD have limited direct responsibility for management of terrestrial PAs in Hainan. ▪ See Annex 2 for UNDP Capacity Development Scorecard baselines
At outcome 2 level	***Strengthened protection, participatory management and restoration of mangrove forests through the development of a Mangrove PA Network (MPAN)***			
1. Operational MPAN is evident	▪ Mangrove PAs are not networked, lack of	Operational MPAN evident through:	i) Official HFD statement announcing establishment of	▪ The Mangrove PA Network consists of seven PAs, with

Annex 5: Project indicators – elaboration and results measurement table

INDICATOR	BASELINE	TARGET	MEASUREMENT	EXPLANATORY NOTES
through: iv) Official recognition of Mangrove PA Network in Hainan PA system plans. v) Network coordination centre and training base established at Dongzhaigang NNR vi) Average of 4 collective training activities per year throughout the project duration vii) All MPAN sites upload and update required site information to MPAN database according to agreed protocols	common management methods and standards, limited information exchange	iv) Official recognition of Mangrove PA Network in Hainan PA system plans. v) Network coordination centre and training base established at Dongzhaigang NNR vi) Average of 4 collective training activities per year throughout the project duration vii) All MPAN sites upload and update required site information to MPAN database according to agreed protocols	the MPAN as a component of the Hainan PA system; ii) Official HFD statement recognizing formation of the MPAN and Dongzhaigang as the coordination centre and training base. iii) Project reports on MPAN collective training activities; iv) Project management checks online database quarterly to assess compliance of individual MPAN sites in contributing information according to agreed protocols and if their information is up to date.	possibility for expansion: Dongzhaigang NNR, Xinying NWP, Qinglangang PNR, Dongfang PNR, Sanya City NR, Xinying Bay City NR, and Huachang Bay CNR. Improvements in management effectiveness for individual PAs will be measured by Objective indicator 1.
2. Improved ecosystem health status of the selected Hainan mangrove PA network sites, indicated by the improvement in the MSL's	EHI baselines for selected sites*: Dongzhaigang NNR: 0.468 Qinglangang PNR: 0.444 Xinying NWP: 0.441	EHI targets for selected sites*: Dongzhaigang NNR: 0.600 Qinglangang PNR: 0.600 Xinying mangrove NWP: 0.600	EHI assessments at: ▪ Baseline in PPG (2012) / Year One (2013-14) ▪ Midterm (2016) ▪ Project Completion (2018) *EHI baselines & targets to	▪ The EHI baseline assessment was conducted for the 3 specified sites in PPG, baselines will be established for the remaining sites in year 1. ▪ See Annex 3 for EHI introduction and baseline scorecards

Annex 5: Project indicators – elaboration and results measurement table

INDICATOR	BASELINE	TARGET	MEASUREMENT	EXPLANATORY NOTES
Ecosystem Health Index (EHI)			be established in Year 1 for other MPAN sites: Dongfang PNR, Sanya City NR, Xinying Bay City NR, Huachang Bay County NR	
3. Increased protection status of selected wetland related reserves	1.Yinggeling PNR (50,464 ha); 2. Fanjia PNR (>5,000 ha); 3.Haiwei Provincial Wetland Park (c.300 ha) 4. Sanya Mangrove City NR (728ha)	1. Yinggeling PNR becomes NNR; 2. Fanjia PNR becomes NNR; 3.Haiwei Prov. Wetland Park becomes NWP. 4. Sanya City NR becomes PNR	Official government documents required for upgrading of the selected provincial level PAs to National level PAs; dates of submission to State Council; official State Council approval announcements.	▪ Note: Yinggeling is a forested catchment area for Haikou area, Fanjia an inland lake/swamp forest area, and Haiwei coastal mangroves and wetlands.
4. Increase in the number of wintering Black-faced Spoonbills *Platalea minor* in Hainan	▪ Wintering population of 76 BF Spoonbills	▪ Wintering population of 100 BF Spoonbills with a stable or increasing trend	▪ Synchronized monthly counts by PA staff at all known BF Spoonbill sites for duration of wintering period (December – May); ▪ Tabulation of count data by MPAN Coordination centre ▪ Periodic independent surveys by local ornithological experts ▪ Monitoring results analyzed and published annually and made available to national authorities for reporting on the CMS International Single Species Action Plan for the BF Spoonbill	▪ Monitoring needs to be supported by provision of training in identification and monitoring methods as well as provision of optical equipment; ▪ Systematic monitoring employing constant levels of effort and synchronized timing are needed to obtain accurate results. ▪ Note that the size of the wintering population in Hainan can be influenced by external factors including weather conditions in mainland China, breeding success, and mortality factors outside Hainan (avian disease, hunting, etc). However, the maintenance and expansion of suitable undisturbed wintering habitat in Hainan can contribute significantly towards population recovery.
5. Increased area of mangrove cover	▪ See table inset below for baseline area of	▪ At least 1,000 ha of mangrove forest	▪ Technical report for each replanting unit specifying	▪ GPS units and centralized GIS capacity to be supported by the

Annex 5: Project indicators – elaboration and results measurement table

INDICATOR	BASELINE	TARGET	MEASUREMENT	EXPLANATORY NOTES
within and adjacent to project demonstration reserves through replanting activities in unproductive aquaculture ponds and other suitable areas	mangrove cover and area of existing replanting efforts at selected sites	replanted with native species at selected sites (see inset table)	species used, spacing of plants, total area, etc ▪ On the ground physical measurements and GPS coordinates of replanted areas by PA staff upon completion of planting units (eg individual aquaculture ponds, mudflat areas) ▪ GPS coordinates for boundaries of replanted areas transferred to GIS maps	project for MPAN sites
	Site / **Mangrove Area** / **Existing Replanted Area** / **Project Target Area** (Additional Replanting) Dongzhaigang NNR / 1578 ha / 60 ha / 600 ha Qinglangang PNR / 1233 ha / 0 ha / 300 ha Xinying NWP / 150 ha / <10 ha / <10 ha Dongfang PNR / 250 ha / <15 ha / 50 ha Sanya CNR / 60 ha / 10 ha / 50 ha **Total** / **3271 ha** / **<95 ha** / **1000+ ha**			
At outcome 3 level	***Improved integration of wetland conservation into development and sectoral planning and practices through a strengthened PA System Management Framework including economic valuation of wetland ecosystem services***			
1. Sector specific standards for tourism and coastal fisheries are consistent with international standards for responsible	▪ Existing plans and practices for key sectors including tourism and fishery development do not meet international standards for responsible ecotourism and fishery practices	▪ Approval of sector specific standards for tourism (based on ecotourism category of the ASEAN Tourism Standards[80]) and coastal fisheries (based on the FAO Code of Conduct	▪ Hainan Tourism Dept endorses adaptation of ASEAN Tourism Standards for ecotourism ▪ Hainan Tourism Dept publicly recognizes tourism companies and facilities meeting ecotourism standards	▪ Technical assistance will be provided by the project to facilitate the consultation process for development of appropriate ecotourism and responsible fisheries standards. ▪ Adoption of Code of Conduct for Responsible Fisheries will be supported by project community

[80] ASEAN Tourism Standards. ASEAN Secretariat, Jakarta. http://www.aseansec.org/23074.pdf

Annex 5: Project indicators – elaboration and results measurement table

INDICATOR	BASELINE	TARGET	MEASUREMENT	EXPLANATORY NOTES
ecotourism and fishery practices		for Responsible Fisheries[81] and related guidelines) ▪ 20 tourism operators apply for ecotourism standard following its approval and announcement ▪ At least two fishing villages voluntarily adopt Code of Conduct for Responsible Fisheries	▪ Hainan Marine & Fisheries Dept endorses adaptation of FAO Code of Conduct for Responsible Fisheries, especially for fisheries and aquaculture in mangrove areas ▪ Community agreements established for two fishing villages to voluntarily adopt Code of Conduct for Responsible Fisheries	co-management, alternative livelihood and awareness activities, targeting villages that impact mangrove resources in MPAN demonstration sites.
2. Key development and sectoral plans such as the 13th 5-year plan and subsidiary plans for key sectors include explicit reference to conservation of the Mangrove PA Network	▪ 12th 5-year plan and subsidiary plans for tourism, fisheries, water resources and other key sectors do not adequately address wetland conservation	▪ 13th 5-year plan and subsidiary plans for tourism (including the Hainan International Tourism Island Master Plan), fisheries, water resources and other key sectors include explicit reference to conservation of the Mangrove PA Network	▪ Official government documents endorsed by the respective provincial government agencies	▪ The five year plans provide the main framework for sectoral planning, including subsidiary plans, guidelines, regulations, etc. ▪ This complements the above indicator, through which the project will also engage with key sectors including tourism and fisheries in order to guide sectoral practices.
3. Establishment of a suitable cross-sectoral body at provincial level to facilitate mainstreaming of wetland conservation into sectoral policies,	▪ Coordination between wetland PA subsystem management and development planning and sectoral planning occurs but is largely responsive and ad hoc	▪ A permanent cross-sectoral body is established at provincial level, formally recognized by all sectors and proactively promoting and facilitating strategic inter-sectoral coordination on	▪ Minutes of provincial government agency meetings providing TOR, membership and operating basis for such a body; ▪ Minutes of meetings by the cross-sectoral body including participants	▪ While a variety of existing mechanisms for inter-sectoral cooperation are in practice, they lack a permanent, strategic proactive approach to strengthen mainstreaming of wetland conservation. The exact scope and TOR for such a body should be determined by the responsible

[81] See: http://www.fao.org/docrep/013/i1900e/i1900e.pdf and http://www.fao.org/docrep/005/v9878e/v9878e00.HTM (includes Chinese language version); and http://www.fao.org/tc/resource-mobilization/ifas/ccrf/en/ for technical guidelines.

Annex 5: Project indicators – elaboration and results measurement table

<table>
<tr><th>INDICATOR</th><th>BASELINE</th><th>TARGET</th><th>MEASUREMENT</th><th>EXPLANATORY NOTES</th></tr>
<tr><td>plans and practices</td><td></td><td>wetland conservation</td><td>list, agenda, matters arising and decisions</td><td>agencies led by HFD and facilitated by the project.</td></tr>
<tr><td>4. Awareness of the value of Hainan's mangrove ecosystem services is increased across a cross-section of provincial audiences</td><td>▪ See inset table below for baseline scores and Annex 6 for details

<table><tr><th></th><th>Full scores</th><th>Scores attained</th><th>% of full scores</th></tr><tr><td>Officials</td><td>49</td><td>27.0</td><td>55</td></tr><tr><td>Enterprise</td><td>45</td><td>22.5</td><td>50</td></tr><tr><td>NGO</td><td>36</td><td>19.4</td><td>54</td></tr><tr><td>Media</td><td>46</td><td>26.6</td><td>58</td></tr><tr><td>Student</td><td>40</td><td>19.4</td><td>49</td></tr><tr><td>Rural</td><td>49</td><td>15.1</td><td>31</td></tr><tr><td>Urban</td><td>49</td><td>24.1</td><td>49</td></tr><tr><td>Sub-total</td><td>314</td><td>154.1</td><td>49</td></tr></table></td><td>▪ Baseline + 50% increase in awareness levels using the same methodology in the final year of the project.</td><td>▪ Awareness assessments applied at PPG and project completion</td><td>▪ See Annex 6 for Knowledge, Attitudes and Practices baseline survey details, including methodology and profiles of respondent groups.</td></tr>
<tr><td>5. Improved data sharing platform for Hainan's wetland PAs is established, regularly updated and in frequent use by a range of data providers and target audiences</td><td>▪ Data on Hainan's wetland PAs are dispersed, largely unavailable online, and not regularly updated</td><td>▪ A centralized database on Hainan's wetland PAs is accessible to online users, updated on a monthly basis and registers at least 100 hits per month</td><td>▪ Project management checks online database quarterly to assess compliance of content with agreed protocols and that information is up to date.
▪ Monthly automated website usage statistics (e.g. Google Analytics).</td><td>▪ There are two sides to this indicator:
A) That information on the MPAN PAs is being made available and kept up to date as planned;
B) That the information is of interest to potential users as recorded by website usage. This can be analyzed by keywords, location of users, pages visited, etc</td></tr>
</table>

Annex 6. Knowledge, Attitudes and Practices Baseline Assessment

The design and implementation of the Knowledge, Attitudes and Practices Baseline Assessment was conducted for the CBPF MSL Programme by Dr Wang Libin. This Annex includes information drawn from the draft report as of 6 December 2012.

1. Introduction

Knowledge, attitudes, and practices (KAP) survey is a popular survey method in social science and public health sector. The purpose of KAP survey is to understand the current status and gaps of the knowledge, attitude, and practices of the target groups on specific issues, so as to design intervention programs to enhance the knowledge, change the attitudes and practices of the target groups to desired ways.

The KAP survey for the CBPF-MSL project aimed to provide the development teams and national stakeholders a more nuanced understanding of public opinion concerning wetlands conservation issues in China. The KAP Survey will assess current (pre-project) levels of knowledge regarding the importance of wetlands, wetland biodiversity and wetland protected areas especially; attitudes towards conservation and development of wetland areas; attitudes towards wetland protected areas and their work; and practices that currently impact the health and functionality of wetlands and the ability of wetland protected areas to do their job successfully. The results of this survey are intended to be used as indicators to gauge programmatic and project level impact on stakeholder perception and behaviour. They will also inform design of an awareness campaign and communication strategy for the project, and also can be used in monitoring awareness impacts later in the life of the project.

2. Survey Methodology

Both qualitative interviews and quantitative surveys will be used to collect data.

The quantitative survey with questionnaires will be applied to collect data from the following seven target groups:

- 100 officials from line ministries (in Beijing) and the departments at provincial, city, county, and township levels (in Jiangxi and Hainan Provinces), included SFA, MEP, MWR, MOA, MLR, SOA, and NDRC, etc.
- 100 managers and technicians from enterprises, including both environment sensitive and environment non-sensitive enterprise, and with a focus on brand name enterprises, both national and international.
- 100 managers and staff from International and National NGO, including both environment and non-environment NGOs, focusing on well-known NGOs.
- 100 journalists (both environment and non-environment journalists) and from media, with a focus on influential media, including State media and local media.
- 100 university students, with a focus on university-level students from Beijing, Jiangxi, and Hainan Provinces, half in environment-related majors, and half in non-environment related

majors.

- 100 respondents from rural communities: the communities were selected near the wetland in project areas in Jiangxi and Hainan。
- 50 respondents from the urban communities: the communities were selected near the wetland in project areas in Jiangxi and Hainan.

In addition, a qualitative interview guide will be developed to have in-depth discussions with the representatives from the above target groups, focusing on understanding the information needs and the preferred information channels of them, so as to develop the communication strategy.

The survey and interview will be mainly carried out by face to face, supported by telephone, e-mails, and post mails.

3. KAP Components

The survey questionnaires cover 4 components: Knowledge, Attitude, Practices, and Information Needs.

Knowledge. This part mainly includes the questions to ask the respondents on their self assessment on the knowledge related to wetland and biodiversity, understanding on the concept, categories, and value of the wetlands, awareness on the policies and regulations related to wetland conservation.
Attitudes. This part intends to get the respondent opinions on the importance attached to wetlands, relationship between economic development (or poverty) and wetlands conservation, perceived barriers in wetlands conservation, measures to overcome barriers and enhancement of capacities, and National priority areas to conserve wetlands
Practices. This part asks the respondents on their activities to conserve wetlands, integration of wetlands into sector development plan or enterprise strategy, and the monitoring of wetlands conservation plans or projects and environmental impact assessment.
Information Needs. This part mainly asks the respondents on their information Sources of information, Suggestions for information dissemination, Information requirements.

4. Data Processing

The quantitative data will be inserted into excel sheet, the descriptive statistics will be used to process the data. The percentage and means will be calculated. The data will be disaggregated among different target groups. The qualitative data will be analyzed by the main issues and themes, and supplement the quantitative data. The data results will be used to analyze the gaps in knowledge, attitude, and practices regarding the wetland conservation, and develop the communication strategies to mainstream the wetland conservation among the public and the sector and enterprise development plan. The results of this survey will be used as indicators to gauge programmatic and project level impact on stakeholder perception and behaviour.

6. Baseline Assessment Results for Hainan

Respondent Profiles

The quantitative survey collected 199 questionnaires, of which, 17% are from government officials at provincial, city, county, and township levels, 14% from enterprises, 15% from NGOs, 3% from media, and 15% from university students, 26% from rural community people, 11% from urban community people near the project sites (Table 1).

Table-1 Sample distribution by groups (n=199)

Groups	Officials	Enterprises	NGO	Media	Students	Rural	Urban	Total
Quantity	34	28	30	5	30	51	21	199
% of total	17	14	15	3	15	16	11	100

Of all respondents, 59% are male and 41% are female. Tables 2 and 3 indicate the sample distribution by age and education. The majority of respondents are among 18-49. In terms of education, the majority of students, media, NGOs, and official groups hold university degrees. The majority of the enterprise people hold senior high school degrees (57%). About one-third of urban residents and rural residents completed senior high school education, and about half of them completed the middle school education.

Table-2 Sample distribution by age (Unit：%)

	18-29	30-39	40-49	50-59	Over 60
Officials	29.4	47.1	20.6	2.9	0.0
Enterprise	50.0	28.6	10.7	10.7	0.0
NGO	96.7	3.3	0.0	0.0	0.0
Media	100.0	0.0	0.0	0.0	0.0
Student	100.0	0.0	0.0	0.0	0.0
Rural	3.9	43.2	35.3	7.8	9.8
Urban	14.3	38.1	23.8	14.3	9.5
Total	37	33	20	6	4

Table-3 Sample distribution by education (n=199) (Unit: %)

	University or above	Junior College	Senior high school	Middle school	Primary school
Officials	67.6	23.5	8.8	0	0
Enterprise	35.7	7.1	57.1	0	0
NGO	76.7	23.3	0	0	0
Media	100	0	0	0	0
Student	100	0	0	0	0
Rural	2.0	5.9	33.3	51.0	7.8
Urban	0	0	28.6	47.6	23.8
Total	37.0	12.0	25.0	21.0	5.0

Tables 4 and 5 show the income sources of rural residents and urban residents. For rural residents, the main income source is aquaculture (54.9% of respondents), followed by fishing (13.7%) and crops (13.7%). The rural residents rely more on the natural resources to make a living. As for urban residents, the income source is more diversified: service (such as tourism, hotel, and dining), operating enterprise, fishing, and working in factories. The urban residents rely less on the natural resources to make a living.

Table-4 Main income source of rural residents (Unit: % of respondents)

Fishing	Aqua-culture	Crop	Live-stock	Migration	Business	Tourism	Salary	Trans-port	Others
13.7	54.9	13.7	5.9	9.8	0	0	2	0	0

Table-5 Main income source of urban residents (Unit: % of respondents)

Fishing	Workers	Officials	Business	Teachers	Transport	Service	Enterprise Owner	Others
14.3	14.3	9.5	4.8	0	9.5	23.8	14.3	9.5

Score of Knowledge, Attitudes, and Practices

To measure the overall respondent knowledge, attitude, and practices on wetland conservation, key questions were selected from the questionnaires and the answers to these questions were graded for scores. The results of the scores are presented in the following tables.

As for knowledge, the media group got the highest score and the rural resident group got the lowest score, and the overall score across all groups is 53.5 of 112, which is 48% of the full score (Table 6). As for attitude, the NGO group got the highest score and the rural resident group got the lowest score, and the overall score across all groups is 35.1 of 58, which is 61% of the full score (Table 7). As for practices, the media group got 54% of the full score and the rural resident group got 25% of the full score, and the overall score across all groups is 65.5 of 144, which is 45% of the full score (Table 8).

Table 6 Scores on knowledge

	Full scores	Scores attained	% of full scores
Officials	16	8.6	54
Enterprise	16	6.6	41
NGO	16	7.1	44
Media	16	11.0	69
Student	16	7.2	45
Rural	16	5.6	35
Urban	16	7.4	46
Sub-total	**112**	**53.5**	**48**

Table 7 Scores on attitude

	Full scores	Scores attained	% of full scores
Officials	8	5.3	66

Enterprise	8	5.2	65
NGO	8	6.0	75
Media	8	3.8	48
Student	8	5.7	71
Rural	9	3.5	39
Urban	9	5.6	62
Sub-total	**58**	**35.1**	**61**

Table 8 Scores on practices

	Full scores	Scores attained	% of full scores
Officials	25	13.1	52
Enterprise	21	10.7	51
NGO	12	6.3	53
Media	22	11.8	54
Student	16	6.5	41
Rural	24	6	25
Urban	24	11.1	46
Sub-total	**144**	**65.5**	**45**

As for the overall score of KAP, the media group got 58% of the full score and the rural resident group got 31% of the full score, and the overall score across all groups is 154.1 of 314, which is 49% of the full score (Table 9).

Table 9 Overall Scores of KAP

	Full scores	Scores attained	% of full scores
Officials	49	27.0	55
Enterprise	45	22.5	50
NGO	36	19.4	54
Media	46	26.6	58
Student	40	19.4	49
Rural	49	15.1	31
Urban	49	24.1	49
Sub-total	314	154.1	49

The survey report provides a detailed breakdown of survey results concerning specific subject areas on knowledge, attitudes and practices. This should be reviewed and taken into account during development of communications and awareness plans at project inception.

Annex 7. Environmental and Social Screening Summary

Name of Proposed Project: CBPF-MSL: Strengthening the Management Effectiveness of the Wetland Protected Area System in Hainan for Conservation of Globally Significant Biodiversity

A. Environmental and Social Screening Outcome

Select from the following:

€ Category 1. No further action is needed

€ Category 2. Further review and management is needed. There are possible environmental and social benefits, impacts, and/or risks associated with the project (or specific project component), but these are predominantly indirect or very long-term and so extremely difficult or impossible to directly identify and assess.

X Category 3. Further review and management is needed, and it is possible to identify these with a reasonable degree of certainty. If Category 3, select one or more of the following sub-categories:

X Category 3a: Impacts and risks are limited in scale and can be identified with a reasonable degree of certainty and can often be handled through application of standard best practice, but require some minimal or targeted further review and assessment to identify and evaluate whether there is a need for a full environmental and social assessment (in which case the project would move to Category 3b).

€ Category 3b: Impacts and risks may well be significant, and so full environmental and social assessment is required. In these cases, a scoping exercise will need to be conducted to identify the level and approach of assessment that is most appropriate.

B. Environmental and Social Issues (for projects requiring further environmental and social review and management)

In this section, you should list the key potential environmental and social issues raised by this project. This might include both environmental and social opportunities that could be seized on to strengthen the project, as well as risks that need to be managed. You should use the answers you provided in Table 4.1 as the basis for this summary, as well as any further review and management that is conducted.

1.1 Would the proposed project result in the conversion or degradation of modified habitat, natural habitat or critical habitat?

Yes, the project supports the restoration of at least 1,000 ha of mangrove habitats within and adjacent to PAs through replanting activities using native species only. The restoration areas and

planting plans for each site will be defined during project implementation, but in general these will be located in abandoned or unproductive aquaculture ponds, agricultural land or in cleared or degraded forest areas. Habitat restoration will increase the greatly reduced and fragmented area of existing mangrove forest by at least 1,000 ha, improve the provision of mangrove ecosystem services and benefit mangrove PAs by strengthening model buffer zones.

1.2 Are any development activities proposed within a legally protected area (e.g. natural reserve, national park) for the protection or conservation of biodiversity?

Yes, the project supports a range of activities within the boundaries of existing protected areas, designed to improve management effectiveness, stakeholder participation and co-management, habitat restoration and sustainable livelihoods.

1.3 Would the proposed project pose a risk of introducing invasive alien species?

No, although mangrove reforestation conducted by Hainan Forestry Department at a number of reserves has made use of alien species including *Sonneratia apetala* and *Languncularia racemosa* as well as native species. These species grow fast but have not exerted significant negative impact, so they are not considered as invasive species. The project will specifically exclude the use of mangrove species that are not native to Hainan Island, which will require vigilance and some capacity building during the planning and implementation of mangrove restoration activities.

4.1 Would the proposed project have environmental and social impacts that could affect indigenous people or other vulnerable groups?

The project will support the establishment of new protected areas and upgrading of other PAs. The new protected areas under consideration are reportedly existing state forest farms which therefore should not involve any changes in land use rights or other new restrictions on indigenous people or other vulnerable groups. However, this should be checked during detailed planning for the new PAs and PA upgrading, as mentioned in the project document, narrative text for Outputs 1.1 and 2.5. Li and Miao ethnic minorities are linked with terrestrial PAs including Wuzhishan NNR, Bawangling NNR and Yinggeling PNR, and the coastal PAs Sanya Mangrove Nature Reserve and Changjiang Haiwei Wetland Park.

8.1 Is the proposed project likely to have impacts that could affect women's and men's ability to use, develop and protect natural resources and other natural capital assets?

Possibly. See the response to point 4.1.

8.2 Is the proposed project likely to significantly affect land tenure arrangements and/or traditional cultural ownership patterns?

Possibly. See the response to point 4.1. In addition, the potential implications of mangrove forest restoration in developed aquacultural and agricultural lands on land tenure and ownership require further examination during the feasibility assessment stage of these project activities, as mentioned in the project document.

C. Next Steps (for projects requiring further environmental and social review and management):

In this section, you should summarize actions that will be taken to deal with the above-listed issues. If your project has Category 2 or 3 components, then appropriate next steps will likely involve further environmental and social review and management, and the outcomes of this work should also be summarized here. Relevant guidance should be obtained from Section 7 for Category 2, and Section 8 for Category 3.

Environmental Impacts:
The project explicitly aims to achieve overall positive environmental improvements with respect to environmental quality, ecosystem integrity and biodiversity conservation in order to achieve global environmental benefits. Owing to the ongoing local practice of using exotic tree species for coastal protection belts and mangrove reforestation (including inside PAs), the project will need to proactively ensure that such practices are avoided for project-related activities and that understanding of the potential ecological impacts of IAS is improved among agency staff.

Social Impacts: There is potential for social impacts in project activities that involve the creation of new PAs, increasing legal protection for existing PAs, and mangrove replanting (habitat restoration) on occupied lands. Hainan's indigenous peoples are mainly distributed in the mountains and will be largely unaffected. However some do occur near coastal wetland PAs, therefore project plans for these specific sites (Sanya Mangrove NR and Changjiang Haiwei Wetland Park) should take specific account of their situations and seek to provide appropriate benefits. In order to avoid or mitigate social impacts, the project document has indicated that planning for these situations needs to identify existing land tenure and land uses and potential social impacts, and to negotiate fair and equitable settlements where applicable, with due regard for individual and community rights. The project promulgates a participatory approach to conservation and will seek to build local capacity for community co-management and stakeholder involvement, including ethnic minorities. It includes resources to support the development of alternative livelihoods and improvements to the sustainability of existing land uses, with potential to offset negative social impacts. Potential benefits to ethnic minorities include identification of their roles in PA management and governance to ensure equitable benefit sharing, capacity building related to sustainable livelihood practices, support for cultural practices that support environmental protection and restoration, and job opportunities related to PA management (participatory patrolling, re-planting, etc) and nature-based tourism.

Further details are as follows:
1.1 The restoration of 1,000 ha of mangrove habitats will greatly increase the reduced and highly fragmented are of existing mangrove forest, improve the provision of mangrove ecosystem services and related biodiversity, and benefit mangrove PAs by strengthening model buffer zones. This will provide a significant improvement on the ecological condition of existing habitats to be replanted, which are of lower conservation value.

1.2: No further action needed – the project's activities within nature reserves are designed to improve management effectiveness towards biodiversity conservation goals, as monitored using an ecosystem health index and other indicators.

1.3: The planning and implementation of mangrove restoration work supported by the project will explicitly exclude the use of mangrove species that are not native to Hainan Island. This requirement is included in the project document.

4.1, 8.1, 8.2: The creation and upgrading of protected areas within the scope of the project is unlikely to involve changes in land use rights, as the areas identified for new PAs are existing forest farms, and the areas identified for upgrading are existing provincial NRs and a provincial wetland park. However it has been identified as a risk in the project document. In general, the project is providing significant assistance in the development of alternative livelihoods for communities within or adjacent to PAs, as well as the development of community co-management arrangements at demonstration sites (e.g. see output 2.6). The provincial government also operates a compensation system for cases involving transfer of land use rights, although this needs to be handled in a fair and equitable manner with due regard for individual and community rights.

8.2: The potential implications of mangrove reforestation on developed aquacultural and agricultural lands on land use rights require further examination during the feasibility assessment stage of these project activities. This requirement has been included in the project document.

D. Sign Off

Project Manager **Date** Dec. 24, 2012

PAC **Date**

Programme Manager **Date**

Annex 8. Letter of Agreement for UNDP Direct Project Services

STANDARD LETTER OF AGREEMENT BETWEEN UNDP AND THE HAINAN FORESTRY DEPARTMENT FOR THE PROVISION OF SUPPORT SERVICES

Dear Dr. Liu Yanling
Deputy Director General– the Hainan Forestry Department

1. Reference is made to consultations between officials of the *Hainan Forestry Department* (hereinafter referred to as "HFD") and officials of UNDP with respect to the provision of support services by the UNDP country office for the project. UNDP and HFD hereby agree that the UNDP country office may provide such support services at the request of HFD through its institution designated in the relevant project support document or project document, as described below.

2. The UNDP country office may provide support services for assistance with reporting requirements and direct payment. In providing such support services, the UNDP country office shall ensure that the capacity of HFD-designated institution is strengthened to enable it to carry out such activities directly. The costs incurred by the UNDP country office in providing such support services shall be recovered from the administrative budget of the office.

3. The UNDP country office may provide, at the request of HFD or its designated institutions, the following support services for the activities of the project:
(a) Identification and/or recruitment of project and programme personnel;
(b) Procurement of goods and services; and
(c) Other project related actions as needed and requested in addition to the country office's project oversight support covered under the GEF implementing Agency fee.

4. The procurement of goods and services and the recruitment of project personnel by the UNDP country office shall be in accordance with the UNDP regulations, rules, policies and procedures. Support services described in paragraph 3 above shall be detailed in an annex to the project support document or project document, in the form provided in the Attachment hereto. If the requirements for support services by the country office change during the life of a project, the annex to the project support document is revised with the mutual agreement of the UNDP Country Director and the designated institution.

5. The relevant provisions of the Standard Basic Assistance Agreement between the Government of China and the United Nations Development Programme in China signed on January 29, 1979 (the "SBAA"), including the provisions on liability and privileges and immunities, shall apply to the provision of such support services. The Government shall retain overall responsibility for the nationally managed programme or project through its designated institution. The responsibility of the UNDP country office for the provision of the support services described herein shall be limited to the provision of such support services detailed in the annex to the project support document or project document.

6. Any claim or dispute arising under or in connection with the provision of support services by the UNDP country office in accordance with this letter shall be handled pursuant to the relevant provisions of the SBAA and the project support document or project document.

7. The manner and method of cost-recovery by the UNDP country office in providing the support services described in paragraph 3 above shall be specified in the annex to the project support document.

8. The UNDP country office shall submit progress reports on the support services provided and shall report on the costs reimbursed in providing such services, as may be required.

9. Any modification of the present arrangements shall be effected by mutual written agreement of the parties hereto.

10. If you are in agreement with the provisions set forth above, please sign and return to this office three signed copies of this letter. Upon your signature, this letter shall constitute an agreement between the HFD and UNDP on the terms and conditions for the provision of support services by the UNDP country office for the project.

Patrick Haverman
Deputy Country Director
United Nations Development Programme

Date: Dec. 6, 2012

Liu Yanling
Deputy Director General
Hainan Forestry Department

Liu yanling
2012. 12. 28

Date: Dec. , 2012

Attachment

DESCRIPTION OF UNDP COUNTRY OFFICE SUPPORT SERVICES

1. Reference is made to consultations between Hainan Forestry Department, the institution designated by the Government of China and officials of UNDP with respect to the provision of support services by the UNDP country office for the nationally managed project *CBPF-MSL: Strengthening the Management Effectiveness of the Wetland Protected Area System in Hainan for Conservation of Globally Significant Biodiversity* (**PIMS#: 4597**).

2. In accordance with the provisions of the letter of agreement signed on_____and the project document, the UNDP country office shall provide support services for the project as described below.

3. Support services to be provided:

Support services (insert description)	Schedule for the provision of the support services	Cost to UNDP of providing such support services (where appropriate)	Amount and method of reimbursement of UNDP (where appropriate)
1. Recruiting three international specialists	To be recruited during 2013 and 2014 as per AWP.	As per UPL, the service fee per case is US$ 953.	ATLAS billing -Estimated amount: US$ 2,859.
2.			
3.			

4. Description of functions and responsibilities of the parties involved:
Description of functions and responsibilities of the parties involved is as per the project document. UNDP country office will provide the services as stated above upon the request of the Hainan Forestry Department. The reimbursement of the UNDP support cost will be recorded as per transactions based on the established UNDP financial regulations and rules.

Annex 9. Review of Wetland Ecosystem Service Valuation and Financing

During the course of the PPG for this project, a review of wetland ecosystem service valuation and financing in China was conducted as an input to the development of seven project documents under the UNDP/GEF China Biodiversity Partnerships Framework (CBFP)-Main Streams of Life (MSL) – Wetland Protected Area System Strengthening for Biodiversity Conservation Programme. The Programme includes a national level project and six provincial level projects. It will be implemented by the State Forestry Administration (SFA) and provincial and local forest departments.

One of the components of the programmatic framework focuses on mainstreaming wetland PAs in development and sectoral planning process and budget allocation systems. In order to increase the government investment in the wetland PA management and to integrate wetland biodiversity concerns in sectoral planning processes at national, provincial and local levels, the Programme, through individual projects, supports: (i) the design and use of economic tools for proving and quantifying the economic value of wetland PAs; and (ii) improvement/development of eco-compensation schemes directed towards strengthening of the PA system management through benefiting PA management units and PA resident and neighbouring communities.

This Programme's strategy is based on the understanding that a major cause of the disconnect between PA planning and management and national development and sectoral planning as well as low financial security of the PA system is insufficient understanding of the economic value of wetland biodiversity and ecosystem services and how the loss of these will economically affect various industries, peoples' livelihoods, and the economy at large. Although a number of economic valuation studies on natural resources and ecosystems have been carried out in China, there is no clear synthesis to cause major policy shift.

The review aimed to fulfil the following objectives:

(i) To conduct a review of ecosystem service valuations and eco-compensation programmes in China;
(ii) To support the development of the economics components for the seven projects (National, Xinjiang, Hainan, Daxing'anling, Anhui, Hubei, and Jiangxi) under the Programme.
(iii) To provide technical contributions to the planning for the coordinated approach of the Project Preparation Grants (PPGs) under the MSL Programme.

The review included a review of available documents, stakeholder meetings in Beijing and Hainan undertaken during a mission to China 5-16 June, and additional information provided by the project teams. Information was subsequently provided by the project teams using a data request template to help inform the design of appropriate economic components across the projects. The review report includes the following sections:

- overview of wetland valuation studies in China, including an annotated bibliography;
- on-going developments in sustainable finance (eco-compensation) in China and their relevance to the Programme;
- available background information to facilitate the design of the economic components for the seven projects and potential design options;
- draft TOR for economists to be hired under the Programme.

Provincial level projects

Table 1 below presents an overview of the key ecosystem services provided by coastal mangrove sites in Hainan, the main threats that they face and the focus of the valuation study, based on the information made available (the review also included sites in other provinces, omitted here). It is expected that detailed design of the studies will be undertaken at the implementation stage. The current information for the sites is based on a rapid assessment by the project teams and is largely qualitative and tentative in nature.

Key features to note are:

- All studies will undertake a CBA of alternative management options / land use. This is to ensure that the economic studies move before presenting a static snap shot of the value of ecosystems services provide under the baseline and provide decision makers with information on key tradeoffs (and their costs and benefits) over a suitable time horizon;
- All studies will attempt to demonstrate how wetland PAs support key productive sectors of the economy to facilitate mainstreaming of wetland ecosystem services into sector plans, policies and strategies;
- All studies will undertake a distributional analysis of the cost and benefits to inform the design of eco-compensation mechanisms and potential PES;
- While the detailed economic assessment will be carried out at demonstration sites, all studies will determine how the results can be aggregated to the provincial scale;
- All studies will review the feasibility of sustainable financing mechanism at the provincial scale (see Table 5); and,
- A sub-set of the provincial sites will develop business plans (including Hainan).

It is worth noting that the Ecosystem Health Index (EHI) assessment (MacKinnon, 2012) sets out a qualitative assessment of the condition of the wetland and identifies threats and possible solutions, which can be used as context for the design of the economic studies (although it is not comprehensive and was not designed for this specific purpose). It also provides a baseline and target against which scenarios for the economic analysis can be established.

Table 1. Overview of economic scoping for provincial level projects - Hainan

Province / Site	Scope of project	Threats to wetlands	Key wetland ES	Key sectors	Key features for economic assessment / sustainable finance study
Hainan	Terrestrial wetland PAs including catchment PAs inland, main focus on **mangrove** PAs along the coast.	Logging Land clearing for agriculture and rubber plantations, infrastructure development, tourism Clearance of mangroves for coastal development including tourism facilities Conversion of mangroves to aquaculture ponds Duck farming in mangrove areas Overexploitation of wetland resources such as fish and shellfish Pollution and disease from sewage, aquaculture ponds and agriculture Electronic fishing Invasive alien species	Provision of food (commercial & subsistence) Tourism potential Carbon sequestration Coastal protection (including: erosion resistance; storm defense; vertical accretion through sediment capture; and biomass accretion) Removal of nutrients and pollutants Nutrient cycling (basis of coastal / marine food chains) Spawning / nursery area for coastal fish, shrimps & other species	Tourism Marine fisheries Aquaculture Agriculture Coastal protection Forestry	Economic land use study comparing sustainable use of mangroves (including tourism if appropriate) with its conversion to shrimp farms, agricultural land, including distributional analysis, identification of opportunities for eco-compensation, new financing mechanisms, and alternative livelihoods. To be undertaken at Dongzhaigang Mangrove Nature Reserve. Focus on the value of mangrove coastal protection function given increased risk of typhoons / flooding, linking with climate change adaptation agenda. A provincial scale assessment of mangrove coastal protection functions Development of business plan for Dongzhaigang

Economic Valuation and Sustainable Financing Guidance for the Hainan Project

The following guidance from the review report has been taken into account in the design of the economic valuation and sustainable financing activities for the CBPF-MSL Hainan Project. The planned interventions can be found in Outputs 1.1 and 3.3 of the Project Strategy.

Background

Hainan is China's smallest province covering 33,920 km^2 and comprising some two hundred islands scattered among three archipelagos off the southern coast of mainland China. Hainan Island accounts for 97% of the province's land mass. The province has a population of 8.7 million (2010) with rapid population growth due largely to immigration prompted by fast economic development. Hainan's economy is predominantly agricultural with the main crops including rice, coconuts and tropical fruits. There is a large off-shore and coastal fishing and aquaculture industry, producing scallops, pearls, shrimps and fish such as tilapia, supporting around 100,000 families. Tourism plays an important part in Hainan's economy, owing largely to its tropical beaches and lush forests. By the first quarter of 2010, Hainan had the highest increase in GDP of any province in China, with a year-on-year increase of 25.1% (draft Project Document, 2012).

Due to past losses of natural habitats and species decline less than 20% of natural forest cover remains in Hainan which are vulnerable to on-going rapid economic development. Hainan contains the most developed and diverse mangrove forests in China, but in 2007 only 3,857 ha of mangrove forest resources remained. Mangroves have been seriously impacted by coastal development and aquaculture practices.

Research on mangrove ecosystem services started in 1980s, with researchers such as Zhang (1993) and Yie & Pang (1987) providing qualitative assessments of mangrove service. The first quantitative assessment of mangrove ecological and community values was undertaken by Dr. Fan Hangqing (1995). In 2000 Fan estimated the environmental contribution of a 100-meter wide green belt of mangrove trees planted along the coast in Guangxi at 61,900 Yuan/ha year or 1.3102 million Yuan/km/year. Han Weidong *et al*. (2000), estimated the ecosystem services of 13, 646 ha of mangrove in the provinces of Hainan, Guangxi, and Guangdong to be worth 2,365.31 million Yuan[82]. However, the Guangxi Mangrove Research Centre, 2003 concluded that the economic valuation of mangroves in China was based mainly on assumption and deduction, without the support of real data and case study. According to Fan Hangqing, there are no specific assessments of ecotourism values related to mangrove reserves yet in China.

A significant initiative that has provided case study results and methodological guidelines with particular relevance to coastal and marine ecosystem services (and hence highly relevant to Hainan's mangrove nature reserves) is the UNEP/GEF South China Sea Project's Regional Task

[82] This total value include - biomass worth 81.63 million Yuan, coast protection 992.06 million Yuan, soil conservation 1,156.92 million Yuan, CO_2 fixation and O_2 release 67.06 million Yuan, animal habitat 54.70 million Yuan, Nutrient accumulation 10.12 million Yuan, pollutant degradation, disease and insect damage prevention 2.82 million Yuan.

Force on Economic Valuation[83, 84]. The programme is operating in seven riparian states bordering the South China Sea (Cambodia, China, Indonesia, Malaysia, Philippines, Thailand, and Vietnam). The study presents Total Economic Values per hectare of mangrove (also coral reefs, seagrass beds and "wetlands") based on a fairly comprehensive set of ecosystem services, and as such provides benchmark values, and potential value transfer values to be used by the MSL project. The South China Sea project included economic valuation of a mangrove demonstration site at Fangchenggang in Guangxi, China, which estimated the windbreak function of Fangchenggang mangroves at 40% of coastal defence costs – US$1,200/ha and carbon sequestration at US$326/ha.

The EHI undertaken for Donzhaigang Mangrove Nature Reserve, at the MSL project development stage, identifies a number of pressures including marine water pollution from aquaculture farms, state farms and domestic sewage, overuse of groundwater supplies, overharvesting of species of economic value, and physical disturbances such as extensive erection of nets and taps, former construction of dams and tourism activities. The EHI suggests the development of ecotourism to reduce local communities reliance and high pressure on resources in the reserve and the promotion of sustainable harvesting by conducting co-management to develop alternative livelihood (e.g. ecotourism) prohibiting using net with fine mesh size. To minimize the impacts of tourism a tourism plan is needed which confirms tourism to the peripheral and/or experimental zone of the site; to reinforce supervision and management on tourism levels.

Proposed economic study[85]

A **mangrove land use study** is proposed, which will compare the sustainable use of mangroves (including tourism if appropriate) with the conversion of the mangroves to shrimp farms or agricultural land. The study will include a distributional analysis, the identification of opportunities for eco-compensation, new financing mechanisms and alternative livelihoods and the development of a business plan. In line with the PIF, **Dongzhaigang** is considered to be an appropriate demonstration site for the land use study. The site presents many opportunities (tourism linked to Haikou City tourism development planning), but also faces aquaculture production problems. The Reserve also has good capacity to undertake such a study.

The analysis will highlight the value of wetland ecosystem services, and conversely the economic losses incurred in relation to these services through wetland loss and degradation, under a range of practices. Mangrove land uses that may be considered by the study include – complete protection, sustainable tourism management, conversion to aquaculture or agriculture. The analysis will highlight the contribution that wetland ecosystems make to the productivity of key sectors. The distributional analysis will highlight impacts of different mangrove management options on different sectors of society (especially the vulnerable and poor) and facilitate the design of potential financing mechanisms.

The study will include the valuation of a number of key mangrove ecosystem services (e.g. coastal protection, fisheries production and nursery function, carbon sequestration and tourism potential) at the demonstration site. However a key focus will be the value of the mangrove forest's **coastal protection**

[83] Reversing Environmental Degradation Trends in the South China Sea and Gulf of Thailand. Project No. GF/2730-02-4340, completed December 2008; http://www.unepscs.org/Regional_Task_Force_on_Economic_Valuation.html;
[84] UNEP. 2007. *Guidelines for Conducting Economic Valuation of Coastal Ecosystem Goods and Services.* UNEP/GEF/SCS Technical Publication No. 8.
[85] Developed with Crawford Prentice

function[86], given the increased risk of typhoons and associated flooding from storm surges under climate change forecasts. This is consistent with both ecosystem-based and community-based adaptation responses to climate change. A **provincial level economic assessment of the mangrove coastal protective function** is also proposed. This is supported by the significant level of interest in disaster risk reduction on behalf of the provincial government (including significant past investment in coastal green belt development, with potential for further expansion, focusing on nature reserve buffer zones to achieve biodiversity co-benefits). This significant policy benefit could leverage more money for wetland conservation. The economic valuation work could build on the research on mangrove protective belt in Guangdong. In Hainan nearly all available land has reportedly been replanted for coastal protection and it would therefore be difficult to extend the green belt further. However, a better understanding of the economic contribution of the mangrove as a result of coastal protection, will be instructive in ensuring on-going maintenance of the greenbelt, and possible strengthening of the NR buffer zones supported by provincial compensation (e.g. for impacted livelihoods / re-training), and adding more depth to narrow mangrove fringes (using native species). The strategy for undertaking the provincial scale assessment of the mangrove coastal functions will need to be developed at the project implementation phase and could involve extrapolation from representative pilot sites of the province.

The CBA of alternative mangrove land use options would be followed by the identification of **sustainable financing options** for wetlands at the demonstration site, linked to a land use study, supported by a high level overview for the provincial wetland network. In the case of Dongzhaigang, this would explore the potential for (i) eco-compensation for converting (unprofitable) aquaculture ponds back to mangroves; (ii) Carbon financing from mangrove forests and soils; (iii) ecotourism development associated with mangrove protection and restoration e.g.DZG receiving annual payments through an MoU arrangement with the proposed wetland park by Haikou City tourism company.

The provincial government's emphasis on 'green tourism' provides an important enabling environment for developing ecotourism associated with mangrove areas, including the restoration of mangroves for tourism purposes (for example potentially in Dongzhaigang and Qinglangang). Provincial government co-financing for such work will be explored. It will be important to ensure that tourism is developed in an ecologically sound manner that benefits biodiversity (i.e. using appropriate native species), and that the tourism visitation pressures can be managed by effective zoning and pollution controls.

Furthermore, technical assistance for more extensive forms of aquaculture that maintain mangrove forest cover (e.g. crab farming / harvesting opportunities) might help balance compensation needs as might assistance with branding and marketing local produce as "eco-friendly".

The data collection and analysis conducted to develop the sustainable financing mechanism will be incorporated into a site **business plan** for Dongzhaigang NNR. The business plan will build on an updated site management plan which assesses and describes the conditions of the site; evaluates current and projected needs and threats; and develops strategies and plans for specific activities to address those threats. The site business plan focuses on the last component and identifies the amount of financing required to implement the activities in the management plan and the potential revenue sources to meet

[86] For example, see: McIvor, A.L., Möller, I., Spencer, T. and Spalding. M. (2012) Reduction of wind and swell waves by mangroves. Natural Coastal Protection Series: Report 1. Cambridge Coastal Research Unit Working Paper 40. Published by The Nature Conservancy and Wetlands International. 27 pages. ISSN 2050-7941. URL: http://www.naturalcoastalprotection.org/documents/reduction-of-wind-and-swell-waves-by-mangroves
And: Technical Guidelines for the Establishment of a Coastal Greenbelt. March 2007. The World Conservation Union (IUCN). Sri Lanka Country Office

those needs (including cost savings). Ideally the business plan should be developed in parallel with the site management plan, as they influence each other, although the business plan provides the means for achieving the management plan, not the other way around. A small team should be tasked with developing the business plan, including the PA Manager, government resource agency representatives (HFD, HDF), Financial Officer, Fund Raising Director, Management Planning Team (or a subset of this).

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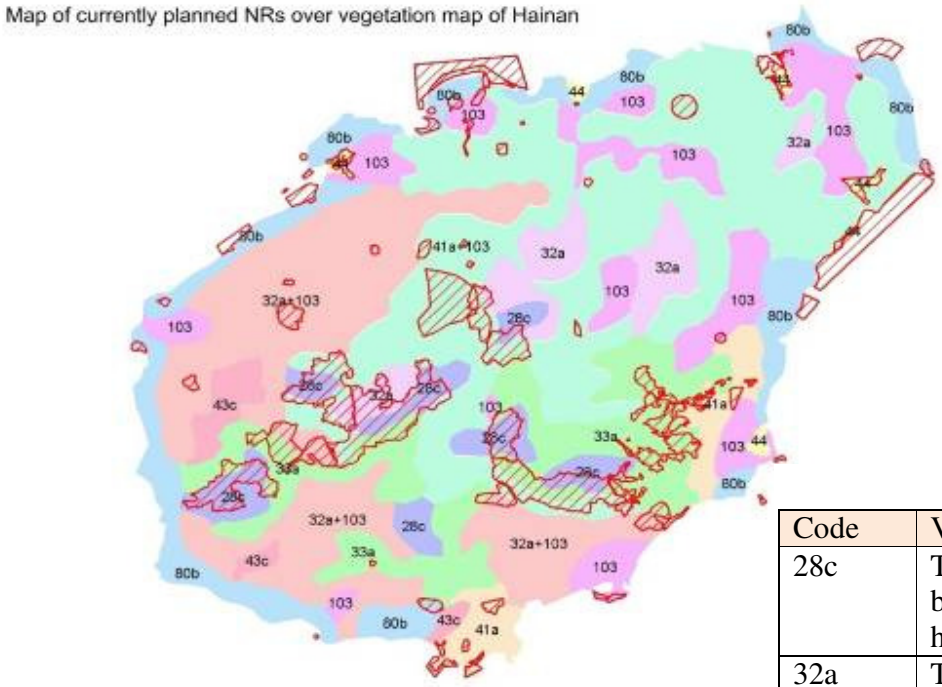
Annex 10. Map of Currently Planned Nature Reserves over Vegetation Map of Hainan

As referred to in the indicators for the Project Objective in the Strategic Results Framework.



Code	Vegetation type
28c	Tropical evergreen broadleaf rainforest hills
32a	Tropical semi-evergreen monsoon forest on laterite
33a	Tropical evergreen lowland forest
41a	Tropical acid shrub forest (*Melastoma*)
32a+103	32a with scattered agriculture
41a+103	41a with scattered agriculture
43c	Tropical limestone forest
44	Mangroves
80b	Tropical coastal savannah thorny forest
103	Double crop rice agriculture
Total	