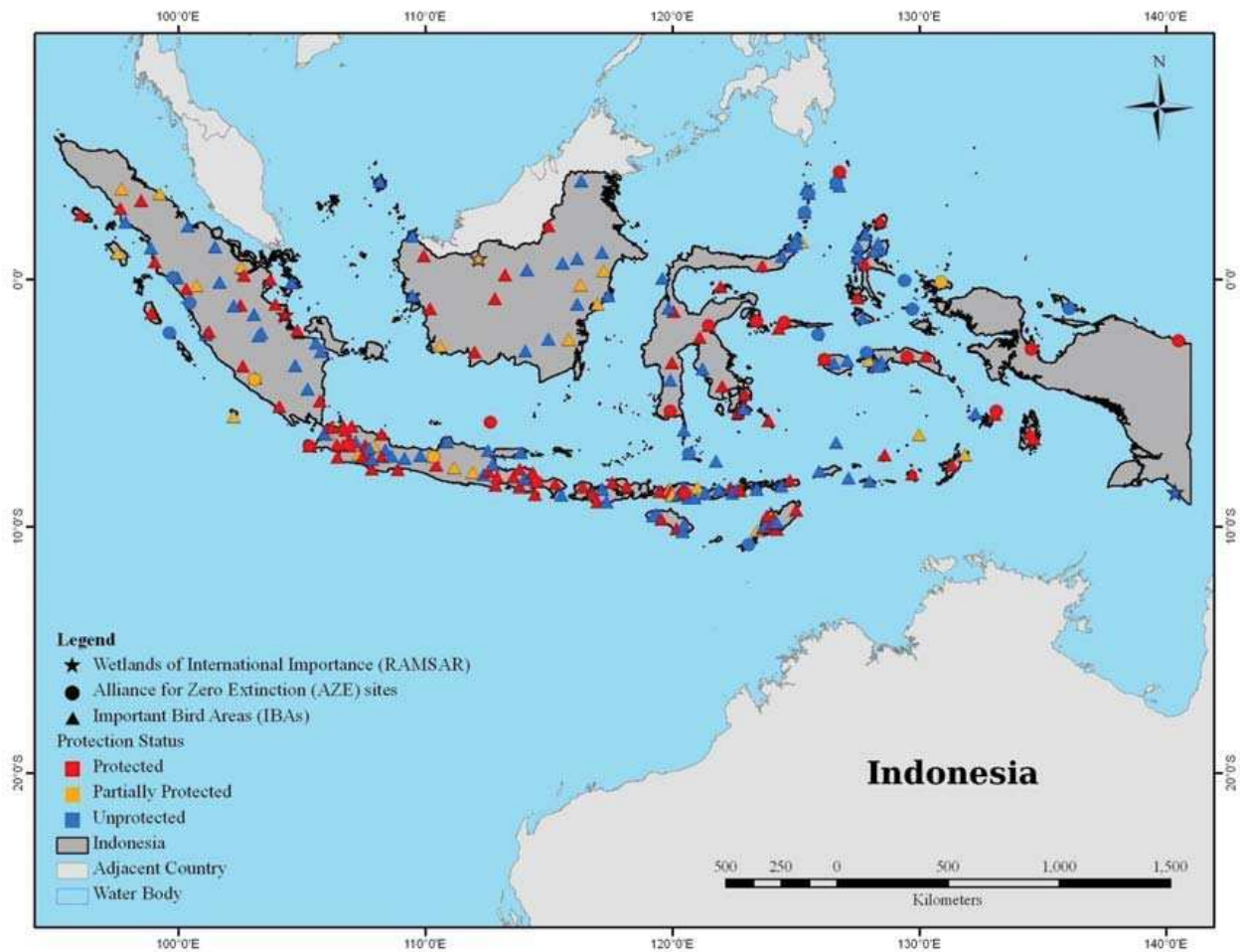# Action Plan for Implementing the Convention on Biological Diversity's Programme of Work on Protected Areas

(Source: Ministry of Forestry)

The Republic of Indonesia

Submitted to the Secretariat of the Convention on Biological Diversity December 10, 2011

Protected area information:

PoWPA Focal Point:

Mr. Sonny Partono
Director of Conservation Areas
Directorate General of Forest Protection and Nature Conservation
Ministry of Forestry
Jakarta, Indonesia
E-mail: onny.galerie@gmail.com

Lead implementing agency:

Ministry of Forestry

Multi-stakeholder committee:

National Implementation Support Partnership (NISP) as the representatives of Ministry of Forestry, Ministry of Marine Affairs and Fisheries, Ministry of Environment and NGOs (TNC Indonesia, WWF Indonesia, WCS Indonesia, Burung Indonesia, Flora Fauna Indonesia, Conservation International-IP and Forest Watch Indonesia).

Description of protected area system

National Targets and Vision for Protected Areas

1. Using results from the Biodiversity Gap Analysis and input from stakeholders, develop agreement amongst all stakeholders on national PA targets to meet national, regional and district conservation goals, and international obligations

2. Develop/ maintain a national GIS database of Pas and capacity to produce annual reports and maps on progress towards targets

3. Undertake annual review of progress against targets and produce an annual report for circulation to stakeholders.

National Action Plan for PA for Indonesia 2010-2015

1. Identifies the highest priority actions to be taken over 5 years to support the management of PA

2. Synergizing the global target with national target

Coverage

Table 1. National Protected Area System 2010

No	NPA	Amount	Wide (hectare)
	Terrestrial (MoF)		
1	National Park (IUCN Category 2)	43	12,328,523.34
2	Nature Reserve (IUCN Category 1)	239	4,330,619.96
3	Wildlife Reserve (IUCN Category 4)	70	5,052,515.39
4	Hunting Park (IUCN Category 5)	13	220,951.44
5	Forrest Park (IUCN Category 5)	22	350,090.41
6	Nature Recreation Park (IUCN Category 5)	103	257,469.85
	PA for terrestrial	**490**	**22,540,170.38**

	Marine (MoF)		
7	Marine National Park	7	4,043,541.30
8	Marine Nature Reserve	8	271,110.00
9	Marine Wildlife Reserve	7	337,308.25
10	Marine Nature Recreation Park	18	767,102.00
		40	**5,419,061.55**
	Marine (MMAF)		
11	National Marine Park	1	3,521,130.01
12	Locally Managed Marine Park	35	4,589,006.10
		36	**8,110,136.11**
	PA for marine	**76**	**13,529,197.66**
	Total PA	**566**	**36,069,368.04**

(Source: Ministry of Forestry and Ministry of Marine Affairs and Fisheries)

Table above shows that currently 10.6% of the total terrestrial land area is within PA, while only 1.27% of the marine environment is within PA.

Description and background

A total of 490 terrestrial conservation areas have been established in Indonesia, covering an estimated area of 22,540,170.38 hectares or approximately 15 percent of the country's total land area. These conservation areas are designated on all major islands and island groups to cover all major habitat types and include 43 National Parks, 239 Nature Reserves, 70 Game Reserves, 13 Hunting Parks, 22 Grand Forest Parks, and 103 Nature Tourism Parks.

The gap analysis report of Indonesia has identified 76 marine conservation areas covering a total area of 13.5 million hectares. An additional 77 terrestrial conservation areas, which encompass a total area of 3.7 million hectares, have both coastal and marine features. In total, there are 153 marine conservation areas in the country covering an area of approximately 17.2 million hectares. These marine conservation areas have been classified under the IUCN Protected Area categories and include 46 conservation areas under Category Ia/Ib (Strict Nature Reserve/Wilderness Protection Area), 20 under Category II

(National Parks); 20 under Category IV (Habitat/Species Management); 32 under Category V (Protected Landscape/Seascape); and 35 under Category VI (Protection with sustainable use of natural resources).

The primary function of these coastal and marine conservation areas is to ensure the sustainability of ecological processes in critical habitats such as mangrove forests, coral reefs and sea grasses. The current protected area system covers 758,472 hectares (21.97%) of mangroves, 747,190 hectares (22.05%) of coral reefs, and 304,866 hectares (17.32%) of sea grasses. The national goal is to protect at least 30% of the total coverage of these critical habitats in Indonesia. To meet the 30% coverage target, an additional 277,335 hectares of mangroves, 240,873 hectares of coral reefs and 527,912 hectares of sea grasses need to be included in the current protected area system.

Governance types

Based on the IUCN protected area matrix with governance types, Indonesia has all the types as explained below:

1. Governance by government

   Government Protected Areas include protected areas that are very restricted in utilization (Nature Reserve/ Category I and Wildlife Reserve/ Category IV), for example: Pangandaran Nature Reserve, West Java Province and Nusa Dua Bird Wildlife Reserve, Banten Province.

2. Shared governance

   Co-Managed Protected Areas (CMPAs) include protected areas that managed by multi stakeholders including government and non government party, for example: Wakatobi Marine National Park, South-East Sulawesi Province and Raja Ampat Marine Park, Papua Province.

3. Private governance

   Private Protected Areas (PPAs) include protected areas managed by private party, for example Indonesia Safari Park, West Java Province and Bali Birds Park, Bali Province.

4. Governance by indigenous people and local communities

   Indigenous/ Community Conserved Areas (ICCAs) include protected areas managed by indigenous people or local communities under government sponsored for its law (village regulation or district regulation), for example Lubuk Larangan (PA for

freshwater fish), West Sumatera Province, Awig-awig (PA for marine), Bali Province and Hutan Larangan (PA for biodiversity and forest function), West Lampung Province.

Key threats

1. Population growth

2. Economic development/ priority

3. Habitat degradation

4. Climate change

Barriers for effective implementation

1. Political/ societal obstacles

2. Institutional, technical and capacity related obstacles

3. Lack of accessible knowledge/ information

4. Economic policy and financial resources

5. Collaboration/ cooperation

6. Legal/ juridical impediments

7. Socio-economic factors

8. Natural phenomena and environmental change

Status, priority and timeline for key actions of the Programme of Work on Protected Areas

Status of key actions of the Programme of Work on Protected Areas

Status of key actions of the Programme of Work on Protected Areas	Status
• Progress on assessing **gaps in the protected area network** (1.1)	2
• Progress in assessing **protected area integration** (1.2)	2
• Progress in establishing **transboundary protected areas** and **regional networks** (1.3)	1
• Progress in developing **site-level management plans** (1.4)	2
• Progress in assessing **threats** and opportunities for **restoration** (1.5)	2
• Progress in assessing **equitable sharing** of benefits (2.1) • Progress in assessing protected area **governance** (2.1)	1
• Progress in assessing the **participation** of indigenous and local communities in key protected area decisions (2.2)	1
• Progress in assessing the **policy environment** for establishing and managing protected areas (3.1) • Progress in assessing the **values** of protected areas (3.1)	1
• Progress in assessing protected area **capacity** needs (3.2)	3
• Progress in assessing the **appropriate technology** needs (3.3)	4
• Progress in assessing protected area **sustainable finance** needs (3.4)	2
• Progress in conducting **public awareness** campaigns (3.5)	3
• Progress in developing **best practices and minimum standards** (4.1)	3
• Progress in assessing **management effectiveness** (4.2)	1
• Progress in establishing an **effective PA monitoring system** (4.3)	2
• Progress in developing a **research program** for protected areas (4.4)	2
• Progress in assessing opportunities for **marine** protection	3
• Progress in incorporating **climate change** aspects into protected areas	1

Status: 0 = no work, 1 = just started, 2 = partially complete, 3 = nearly complete, 4 = complete

(Insert notes as appropriate)

Priority actions for fully implementing the Programme of Work on Protected Areas:

A. Program Element I: Direct Actions for Planning, Selecting, Establishing, Strengthening and Managing PA Systems and Sites

- PA System Design and Representativeness

    1. PA targets and indicators

    2. Site-based PA planning and management

    3. PA and climate change

B. Program Element II: Governance, Participation, Equity and Benefit Sharing

- Community involvement, benefit sharing and sustainable development

C. Program Element III: Enabling Activities

- Institutional and policy framework

- Sustainable financing

- Building human resources capacity

D. Program Element IV: Standards, Assessment and Monitoring

- Monitoring, evaluation and reporting

    1. Management effectiveness evaluation

    2. Monitoring and evaluation strategy

    3. Information systems

Timeline for completion of key actions
2010-2015

Action Plans for completing priority actions of the Programme of Work on Protected Areas

Action 1: Site-based PA Planning and Management

Key steps	Timeline	Responsible parties	Indicative budget
1. Identify good examples of management planning and zoning systems and use these to develop best practice standards for use in other PA	2010-2012	NGOs, MoF, MoMAF	
2. Undertake an analysis of actions needed to strengthen the legal basis for zoning and enforcement activities and revise legislation or regulations as necessary	2011-2014	MoF, MoMAF, NGOs	
3. Review infrastructure, equipment and resource needs for all Pas and identify sources of funding to fill gaps through the sustainable financing strategy	2011-2015	NGOs, MoF, MoMAF	
4. Strengthen law enforcement in PA through enhanced training of staff in law enforcement procedures and ensuring they are adequately resourced to undertake regular patrolling	2014	MoF, MoMAF, police, NGOs	
5. Strengthening law enforcement coordination with law enforcer and other relevant government agencies	2014	MoF, MoMAF, police, NGOs	

Action 2: Dealing with climate change

Key steps	Timeline	Responsible parties	Indicative budget
1. Research on building resilience to climate change into PA network design	2010-2013	NGOs, MoF, MoMAF, MoE	
2. Raise awareness amongst policy-makers and community of implications of climate change on small islands and other PAs	2010	MoF, MoMAF, MoE, NGOs	
3. Develop methodologies and agreed processes for carbon accounting and trading related to REDD and other mechanism in PAs	2010-2013	NGOs, MoF, MoMAF, MoE, MoFinance	
4. Integrating climate change issue into PA's site based management to protect biodiversity in PA's	2011	NGOs, MoF, MoE, provincial/ district government, local university, NGOs	

Action 3: Community involvement, benefit-sharing and sustainable development

Key steps	Timeline	Responsible parties	Indicative budget
1. Undertake a review of boundary or land disputes and the underlying reasons and develop and implement a program to cooperatively resolve the problems with local communities, local government and other stakeholders	2011-2015	MoF, MoMAF	
2. Integrate Pas in Regional Spatial Planning	2012	MoF, MoIA, MoMAF, local government	
3. Develop suitable alternative livelihood scheme from environmental services generated by individual PA	2011		
4. Evaluation and re-design the collaborative scheme for more equitable sharing of both cost and benefit arising the establishment and management of PA	2011	MoF, MoMAF, NGOs	
5. Build in lesson learnt in pilot collaborative management programs to develop policy and revise legislation or regulations to provide a sound legal basis for effective participation of major stakeholders in PA management through collaborative mechanisms	2014	MoF, MoMAF, MoIA, NGOs	
6. Develop policies and procedures to involve tourist operators in managing eco-tourism in Pas and sharing responsibility in Pas management	2015	MoF, MoMAF, MoE, NGOs, MoT	
7. Provide case-studies, campaigns, publicity materials to improve the understanding of communities, public and key stakeholders	2015	NGOs, MoF, MoMAF	
8. Review experience with sustainable development activities in buffer zones within or adjoining PAs in Indonesia and their role in contributing to management of Pas or impacting on condition and sustainability of Pas. Clarify buffer zone concepts and approaches	2012	NGOs, MoF, MoMAF	
9. Initiate a program working with MoEducation on PA education in schools	2010-2015	NGOs, MoEd, MoE, MoF, MoMAF	
10. Develop measurement mechanism on developed community empowerment program	2011		

Key steps	Timeline	Responsible parties	Indicative budget
11. Develop of species, nature and culture based tourism in PA's by involving all key stakeholders	2011	MoF, NGOs, MoTourism, tour operator, traditional communities	

Action 4: Institutional and Policy Framework

Key steps	Timeline	Responsible parties	Indicative budget
1. Develop mechanisms for coordination amongst PA management authorities across agencies at national, provincial and local levels	2011	MoE, NISP Partnership Committee	
2. Develop institutional arrangement to effectively manage all types of PA in line with PP NO. 6/2007 to develop KPHKs	2011	MoF	
3. Revise Act No. 5/1990 and implementing to accommodate all issues concerning effective PA management including the roles of local community and other stakeholders within the framework of Collaborative Management, incentive mechanism for private Pas and how PNBP can be directly invested to the management of PAs	2011		
4. Develop implementing regulations under Act 31/2004 on Fisheries for the establishment management of MPAs	2011	NGO, MoMAF	
5. Develop institutional framework at local level for the management of MPAs	2015	NGO, MoMAF	

Action 5: Sustainable Financing

Key steps	Timeline	Responsible parties	Indicative budget
1. Continue existing mechanisms to obtain direct financial assistance and in-kind support for PA management through the NGO sector and bilateral or multilateral donors	2015	MoF, MoMAF, MoE, NGOs	
2. Work through the National Implementation Support Partnership to mobilize additional support for PA management in Indonesia	2010	NISP Partnership Committee supported by NGOs	
3. Analyze best options and develop regulation for sustainable funding mechanisms for Pas in	2010-2011	NISP Partnership Committee	

Key steps	Timeline	Responsible parties	Indicative budget
Indonesia		supported by NGOs, MoFinance	
4. Review the current budget process for allocation of budgets to Pas to ensure allocations are based on estimates of the management requirements and biodiversity values of each PAs	2011	MoFinance with MoF, MoMAF, MoE	
5. Develop guidelines, tools and capacity building for PA managers to assist them develop systems on self and sustainable financing of PAs	2011	MoFinance with MoF, MoMAF, MoE, Provinces	
6. Carry out a "Making the Case for Pas" campaign to mobilize domestic support and funding for PAs	2010-2015	NGOs, MoF,MoMAF,MoE	
7. Develop REDD pilot project in PA's for funding to support management of the PAs	2010-2015	MoF, NGOs, MoE	

Action 6: Building Human Resource Capacity

Key steps	Timeline	Responsible parties	Indicative budget
1. Undertake a comprehensive training needs assessment for staff of PA management agencies at all levels of management	2010	NGOs, MoF, MoMAF, MoE	
2. Re-establish the School of Environmental Conservation Management and work with NGOs and donors to develop a long-term training and capacity building program incorporating priorities identified through the needs assessment	2011-2012	MoF, MoMAF, NGOs	
3. Development of career path for PA staff from field level to management level and support staff to develop long term technical expertise in specialist areas through development of training and education system on the conservation for all levels of management	2012	MoF, MoMAF	
4. Develop guidelines, tools and capacity building for PA managers to assist them implement effective PA management	2012	MoF, MoMAF, MoE, Provinces	

Action 7: Management Effectiveness Evaluation

Key steps	Timeline	Responsible parties	Indicative budget
1. Complete management effectiveness for monitoring, evaluating and reporting for all PA categories in national and regional level, and revise best management practices based on recommendations arising from the study	2011-2012	MoF, MoMAF, NGOs	
2. Adopt, as a routine component of PA management for all PA categories, ongoing systems for evaluating management effectiveness of individual PAs	2010-2015	MoF, MoMAF, NGOs	
3. Regularly adapt management practices based on findings of Management Effectiveness evaluations	Started from 2010	MoF, MoMAF	

Action 8: Monitoring and Evaluation Strategy

Key steps	Timeline	Responsible parties	Indicative budget
1. Review current M and E systems and develop a comprehensive M and E strategy for PAs	2010	NGOs, MoF, MoMAF, local government	
2. Develop training program for managers and staff to implement the M and E strategy	2011	NGOs, MoF, MoMAF	
3. Develop system for reporting based on M and E findings, scientific knowledge including: [1] annual PA monitoring and evaluation report, [2] CBD WHC and Ramsar Convention reporting	2011	MoF, MoMAF, MoE, local government	

Action 9: Information Systems

Key steps	Timeline	Responsible parties	Indicative budget
1. Assess information management needs at national and local levels for consideration of funding needs identification	2010	MoF, MoMAF, MoE, NGOs	
2. Develop and implement programs to monitor the status of biodiversity within PA systems and sites	Started from 2010	MoF, MoMAF, MoE, NGOs	
3. Develop information system within MoMAF for marine resources	2014	MoMAF, NGOs	

4. Establish national standards and strengthen linkages between PIKA, NBIN, MoMAF databases, NGO networking information system and the national Clearing House Mechanism so that data can be effectively shared and reported	2014	MoE, LIPI, MoF, MoMAF, Bakosurtanal	
5. Develop training programs to support information management in resource management agencies	2012	MoF, MoMAF, MoE, NBIN, Bakosurtanal, NGOs	

Abbreviation:

Bakosurtanal   : National Survey and Mapping Coordination Agency
LIPI   : the Indonesia Institute of Sciences
MoE   : Ministry of Environment
MoEd   : Ministry of Education
MoF   : Ministry of Forestry
MoFinance   : Ministry of Finance
MoIA   : Ministry of Internal Affairs
MoMAF   : Ministry of Marine Affairs and Fisheries
MoTourism   : Ministry of Tourism
NGO   : Non Governmental Organization
NISP   : National Implementation Support Partnership

Key assessment results

Ecological gap assessment

A gap analysis was initiated to determine the representativeness of biodiversity in Indonesia's existing conservation area system and determine the level of representation of ecosystems to ensure their long-term survival. An ecosystem classification map was produced for the major island and group of islands based on the analysis and overlay of forest cover maps, maps of essential ecosystems and species maps. Three types of ecosystems were identified:

- Critical/important ecosystems - areas that are important for species protection that include the extent of the species habitat and home range and/or essential ecosystem such as peat, savanna and marsh.

- Buffer/corridor ecosystems - areas that are still forested but not essential to the species as habitat and/or home ranges which can serve as wildlife corridors and link between conservation areas.

- Disturbed ecosystems - areas that have no forest or are not essential ecosystem and not used by species as habitat and/or home range both within and outside the conservation area. The overlay of the map of conservation areas with the ecosystem classification map resulted in the identification of the critical ecosystems that are currently outside of the existing network of conservation areas. The ecological gap analysis was conducted separately for each of the seven major islands or group of islands, namely: Sumatra, Kalimantan, Java-Bali, Nusa Tenggara, Sulawesi, Maluku and Papua.

Representation of different habitat types (i.e., lowland rainforest, peat swamp forest, montane forest, tropical pine forest, etc.) in the network of conservation areas was also analyzed per major island or groups of island.

Results of the analysis showed that many identified important ecosystems are not represented in the conservation areas network in Indonesia. Although existing conservation areas cover approximately 15% of the country's land area, there are many important habitat types that are under-represented in the network of conservation areas. In Sumatra, for example, only 3.42% of the fresh swamp forests and 6.98% of the peat swamp forests are found within conservation areas. Representation of lowland rainforests in conservation areas in all of the seven major islands or groups of islands is below 10%, with Kalimantan having the lowest representation at 2.46%.

Montane rainforests and tropical pine forests have the highest percentage of representation in Sumatra with 31.63% and 34.73%, respectively. The same trend in habitat representation is followed in all the other major islands.

Marine gap analysis

The percentage coverage of the critical habitats within conservation areas per province was analyzed to determine the area of the critical ecosystems that would need to be prioritized for protection. Out of the 33 Indonesian provinces, only nine have met or exceeded the conservation target of protecting at least 30 percent of their mangrove forest ecosystem. The Provinces of Lampung, Banten and Jambi have protected more than 80percent of the mangrove forest ecosystems in their area. Five provinces do not have any conservation areas that cover mangrove forests. These are North Maluku, West Sulawesi, South Sulawesi, Bangka Belitung and South Sumatra. However, as mangroves are not equally distributed among the political geographies of the country, the provinces of South Sumatra, East Kalimantan and Papua, having the largest mangrove areas in the country, would need to exert more effort to meet their conservation targets.

Five provinces have met or exceeded the target for conservation of sea grass ecosystem. The Provinces of East Nusa Tenggara and Papua have protected more than 90% of sea grasses in their respective jurisdictions. Maluku Province has the largest coverage of sea grass ecosystem and would need to exert more effort compared to other provinces to meet its conservation target.

Indonesia also initiated a comparison of the representation of marine ecosystems within conservation areas by eco-region. There are 12 marine eco-regions in Indonesia: eight do not meet the conservation target of at least 30% of mangrove forests protected, nine for coral reefs, and 10 for sea grasses. None of the three critical habitats are protected within the Halmahera Eco-region.

Marine species concerns in Indonesia focus on the mega-fauna, specifically the marine turtles and dugong. Of the seven known species of marine turtles, six are found in the waters of Indonesia. Out of the 95 marine turtle nesting sites identified in the country, 47 are protected and the remaining 48 are located outside of the conservation areas. Of the 28 identified dugong habitats, 13 are protected and the remaining 15 habitats are found outside of the conservation areas.

In Indonesia 242 KBAs 227 IBAs and31 AZEs have been identified in the gap analysis. Out of the 242 KBAs only 105 KBAs are fully protected, 29 KBAs are partially protected and 108 KBAS have yet not protected.

For marine protected areas, identification of Indonesian marine eco-region has been initiated. Twelve eco regions have been prioritized for conservation based on its biodiversity and representativeness. Major habitats within those 12 eco regions include coral reef (22.7%), mangrove (22%), and sea grass (17.3%).

Management effectiveness assessment

The term management effectiveness reflects three main "themes" in PA management:

1. Design issues relating to both individual sites and PA systems
2. Adequacy and appropriateness of management systems and processes
3. Delivery of PA objectives including conservation of values

Marine

Conservation program are not present within four out of twelve eco regions. Meanwhile other eco regions are still facing problem is providing of management plan, institutions, infrastructure, and human resources/staffs. Further challenges include surveillance system, sustainable uses of the conservations areas for community and local economy, and securing commitment from local government. To increase the effectiveness of MPA management, three different level of managements were proposed: i) national marine park is governed by the national unit, ii) local marine protected areas are governed by the local governments, and iii) LMMA that is governed by local community. In application, it requires clear strategy and management plan, management of protected area networks, synergy of role and responsibility, and strengthening of partnership with community, university, private sector, and NGO. Ministry of Marine Affairs and Fisheries released the Guideline of Assessment for Marine Protected Area Management Effectiveness (2011) made by TNC and the pilot projects are in Wakatobi Marine National Park and Berau LMMA.

Sustainable finance assessment

A recent study on PA funding in Indonesia calculated that current funding for PAs in Indonesia is US$ 53.37 million, with US$ 38.01 million coming from government budget., US$ 11.51 million coming from NGOs and US$ 3.85 million coming from bilateral and multilateral donor. The study also calculated that the optimal level of funding for effectively managing existing PAs is US$ 135.31 million. The current shortfall is therefore US$ 81.94 million (not including infrastructure costs). There is a shortfall for all classifications of PAs in Indonesia and this will be further exacerbated by the need to expand the MPAs system to include under-represented areas.

Financial requirement assessment for marine had been undertaken at 2006 where the findings showed that marine protected areas management requires US$ 70 million/year (for 13.94 million ha of MPA).

Capacity needs assessment

Existing training programs covering PA management include Ministry of Forestry Centre of Forestry Education and Training, Bogor Agriculture Institute, Gadjah Mada University and other universities. Several international NGOs have special training programs for conservation and law enforcement program.

Under the current structures and management of the Ministry of forestry staff and transferred between divisions and are unable to build-up long term expertise in various specialist areas of PA management.

For marine, a number of capacity building activities have been implemented as a result from need assessment. These activities are undertaken with the collaboration with university and international partners (NOAA and CTSP). It includes training of trainers, training on basic management of MPA, technical guidance for conservation activity, community economic development, public awareness, and information exchange between MPA staffs.

Policy environment assessment

This assessment ensure that the overall institutional and policy framework needed to support effective management of PAs is in place. The assessment includes:

1. Coordination among PA agencies at national and district level

2. Cross-sector issues and mainstreaming

Protected area integration and mainstreaming assessment

Policy on integration of conservation areas onto spatial planning strongly mandated by the Spatial Planning Act (26/2007), Disaster Management Act (24/2007), and Coastal and Small Island Management Act (27/2007). For example, areas that prone to natural hazards, essential for evacuation, and required for disaster mitigation (e.g. coastal setback areas) need to be designated as protected areas. These mandates provide strong legal basis and policy to integrate protected areas within broader development activities and to address multi interest other than biodiversity such as disaster mitigation and climate change adaptation.

Integration with fisheries development also has been endorsed and mandated by the Fisheries Act (45/2009) where to sustainably managed fisheries resources, protection of marine species and habitats are required.

Protected area valuation assessment

Indonesia has protected area valuation assessment especially for marine protected area. Some protected areas (Kepulauan Seribu Marine National Park and Bali Barat National Park) have valuation assessments that had been done by researchers and post graduate students, and some valuation had been done by local government (Lembeh Strait, North Sulawesi Province).

Climate change resilience and adaptation assessment

Action on building resilience into the design and management of MPAs is particularly urgent because, for example, of the prospect of significant loss of coral reefs through coral bleaching. Significant impacts on terrestrial PAs are also possible, with a need for planning of wildlife corridors, planting fruit trees on restoration program, PA boundaries and buffer zones to allow for movement of species in response to changing habitat conditions. Forest fire prevention drives by climate change, including the developing canal blocking to keep water rise level especially in peat swamp forest.

On the positive side, national and international schemes for trading carbon are now being developed and there is potential for PAs to play role in these types of schemes as carbon sinks. This may be an avenue to bring more funding to PA management in Indonesia.

Worksheed for Capacity Needs to implement Marine PoWPA Actions

Key Marine Assessment and Action	Capacity required to fully implement the PoWPA Target
• What is the progress on assessing marine **gaps in the protected area network** (1.1)	Technical capacity to gather or conduct assessment on designating the potential MPA network
• What is the progress on filling marine gaps in the protected area network? (1.1)	
• What is the progress in assessing marine **protected area integration opportunities** (1.2)	Linking terrestrial PA, and marine and coastal Pas incorporation of conservation/MPA objectives on to sector development
• What is the progress in implementing marine protected area integration? (1.2)	Marine spatial planning/zoning
• What is the progress in establishing marine **transboundary areas** and **regional networks** (1.3)	Technical capacity to design/determine potential areas for network (connectivity assessment) Communicating the result to policy maker/stakeholder
• What is the progress in developing **site-level MPA management plans** (1.4)	• Public communication skill • Tools for MPA management e.g. GIS, target prioritization
• What is the progress in assessing marine **threats** and opportunities for marine **restoration** (1.5)	• Best practice in marine habitat restoration • Marine ecosystem based approach for development
• What is the progress in mitigating marine threat and implementing marine restoration measure (1.5)	
• What is the progress in assessing and improving **equitable marine benefits sharing** (2.1)	• Community participation and consultation skill methods • Economic valuation of MPA designation/management
• What is the progress in assessing and diversifying marine protected area governance ? (2.1)	• Legal drafting of different type of MPA governance
• What is the progress in assessing the **participation**	• Community facilitation • Group discussion skill

of indigenous and local community participation for MPA (2.2)	• community based resources mapping
• What is the progress in improving protected area participation for MPA	
• What is the progress in assessing the enabling marine **policy environment** for establishing , managing and financing protected areas (3.1)	• Translating MPA issues into broader development activities/programs, e.g. poverty and economic development • Funding raising/proposal development
• What is the progress in improving the protected area marine policy environment? (3.1)	
• What is the progress in assessing the marine values of protected areas) (3.1)	• Valuation of MPA • Communicating valuation result to stakeholder
• What is the progress in assessing marine protected area **capacity** (3.2)	Assessment of minimum standard for MPA management in term of number of staff and facilities.
• What is the progress in improving marine protected area capacity? (3.2)	
• What is the progress in assessing marine-specific appropriate technology needs? (3.3)	• Marine species movement tracking • Marine environmental quality monitoring system
• What is the progress in developing marine **appropriate technology** (3.3)	
• What is the progress in assessing marine protected area **sustainable finance** needs (3.4)	• ecotourism development in MPA
• What is the progress in improving marine protected area **sustainable finance** needs (3.4)	• Fund raising/proposal development • Benefit cost analysis of MPA
• What is the progress in conducting marine protected area **public**	

awareness campaigns (3.5)	
• What is the progress in developing marine **best practices and minimum standards** (4.1)	• Reporting and presentation of MPA pilot project and success story
• What is the progress in assessing marine protected area **management effectiveness** (4.2)	• Monitoring and evaluation method/framework • Data collection and analysis for assessment • setting of management indicators
• What is the progress in improving marine protected management effectiveness? (4.2)	
• What is the progress in improving marine protected area management **effectiveness**(4.3)	•
• What is the progress in establishing an **effective MPA monitoring system** (4.3)	
• What is the status of assessing marine research needs for marine protected area? (4.4)	
• What is the status of developing a marine **research program** for protected areas (4.4)	
• What is the status of incorporating **climate change** aspects into protected areas?	• Incorporation of climate change impact onto MPA management • MPA resilience site planning

REFERENCES

Director of Marine and Aquatic Resource Conservation (2011) *Presentation*. Kebijakan Pengelolaan Kawasan Konservasi Perairan. Jakarta: Ministry of Marine Affairs and Fisheries.

Ministry of Forestry (2010) *National Action Plan for Protected Areas for Indonesia 2010-2015.* Jakarta: ---