

## Recent Development of Marine Protected Areas (MPAs) in Indonesia: Policies and Governance

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### ABSTRACT

Up to 2007, Central Government of Indonesia (Jakarta) has enacted four National Legislations related to MPA establishment and management. Field visits were conducted to six different MPAs with different level of management – Manokwari, Raja Ampat, Wakatobi, Berau, Komodo and Nusa Penida. The study aimed to document mode of declaration and governance of different MPAs in Indonesia. Our finding from Manokwari and Raja Ampat indicated that various MPAs in Indonesia have been practiced over years, even before the Dutch colonization. Villagers committed and complied with all verbal rules of *Sasi Laut*, local name of community-managed MPAs in Papua. Under New Era (Orde Baru) of Suharto (1970 – 1995), Ministry of Forestry has designated various MPAs spread over the archipelago. All MPAs are equipped with clear zoning regulation and management body (Manokwari, Wakatobi and Komodo). However, the level of compliance were very low and many were considered as just paper park. Since 2004, Ministry of Fisheries and Marine Affairs has given a responsibility in the development and management of MPAs with main objective to sustain marine capture fisheries (Berau, Raja Ampat and Nusa Penida). Roadmap of these new and immature MPAs are not completed, yet need a clear regulation to restrict resource uses and with a clear management body.

**Key words:** marine conservation, fisheries management

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### INTRODUCTION

Government of Indonesia (GoI) was the 8<sup>th</sup> signatory to United Nations Convention on Biological Diversity (UNCBD) on June 5<sup>th</sup>, 1992 – this convention was formally ratified through National Act No. 5, 1994. Consequently, GoI committed to set aside terrestrial and marine areas, designated as protected area. The first national regulation on protected area, included MPA, was enacted in 1990 (cf. National Act No. 5, 1990) with primary objective to protect biodiversity through conservation of its habitats. Since then, number and total area of MPAs in Indonesia have increased tremendously. Four types of MPAs in Indonesia have been identified fit to IUCN categories [1] – “Cagar Alam” (Strict Nature Reserve) was considered fit for category Ia of IUCN, “Taman Nasional” was equal to category II, “Taman Wisata” fit for category V and “Suaka Margasatwa” (Wildlife Reserve) that belong to category IV of IUCN.

Recently, interest in using MPA as a tool for marine resource management has been driven by the expectation that MPA might counteract collapse in marine fisheries. In line with this idea, GoI has formulated policy and enacted a new regulation on MPA that attached to fisheries management scheme (cf. National Act No. 31, 2004 [2]). The National Act is implemented through Government Regulation No. 60, 2007 on Conservation of Fisheries Resources. Under this new regulation, there were four MPA categories have been identified: “Suaka Alam Perairan” (Marine Wildlife Reserve), “Taman Nasional Perairan” (Marine National Park), “Taman Wisata Perairan” (Marine Recreational Park) and “Suaka Perikanan” (Fisheries Refugee). However, there is no study so far to include each of these MPAs into IUCN categories.

Political situation in Indonesia was significantly changing since early 2000. These changes cover many aspects of governance system. The most crucial aspect was the spread of government power, from centralized system toward decentralized system, providing more authority to local governments to manage their own resources. In 2004, central government in Jakarta formulated a policy reform to share authority to local government in the management and conservation of local resources (cf. Article 18 of National Act No. 32, 2004 on local government).

Various, small-sized and isolated MPAs have been practiced over years at many regions in Indonesia [3]. These community-managed MPAs, referred to as “Sasi Laut” in Papua or Maluku, are based on verbal regulation that created through negotiation between local communities and its local leader. Different regions took their own name with almost the same meaning, being a MPA. “Panglima Laot” is a local name that referred to as MPA in Nangroe Aceh Darussalam. Consequently, there are four management bodies who have the right to develop and manage MPAs – Ministry of Forestry (terrestrial and marine protected areas), Ministry of Marine

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Affairs and Fisheries (for MPAs), local governments (provincial and district level government) and local-informal leaders. In this paper, an investigation was conducted to document mode of declaration and governance of different MPAs in Indonesia. Furthermore, the role of MPAs, traditionally thought as an instrument for biodiversity conservation, as a tool for management of Indonesia's marine capture fisheries was also studied.

### MATERIALS AND METHODS

In this study, four national regulations related to MPA management were analyzed: National Act No. 5, 1990 on Conservation of Biodiversity and its Ecosystem, National Act No. 31, 2004 on Fisheries, National Act No. 32, 2004 on Local Government and National Act No. 27, 2007 on Management of Coastal and Small-Islands. The analyses were mainly focused on MPA objectives, management authority and level of protection.

A field visit was conducted to six formal MPAs under different management authorities – Cendrawasih Bay National Park located in Manokwari West Papua; Wakatobi National Park, Sulawesi; Komodo National Park, East Nusa Tenggara; Berau MPA, East Kalimantan; Raja Ampat MPA, West Papua and Nusa Penida MPA, Bali (Figure 1). Furthermore, a short visit was done to two locally-managed MPAs, referred to as “Sasi Laut”, in Village Deer Raja Ampat and Manokwari. These two MPAs are considered non-formal with no legal or formal basis, although level of obedience is considerably high.

For each formal MPA, we participated in a resource use monitoring to gain understanding on level of compliance by users and consistency of patrol team to enforce the MPA regulations. The operational policy of patrol team in the field was cross-checked with related national acts and its MPA derivative regulations. Furthermore, an interview was done to MPA authority and MPA users to investigate the achievement of MPA objective.

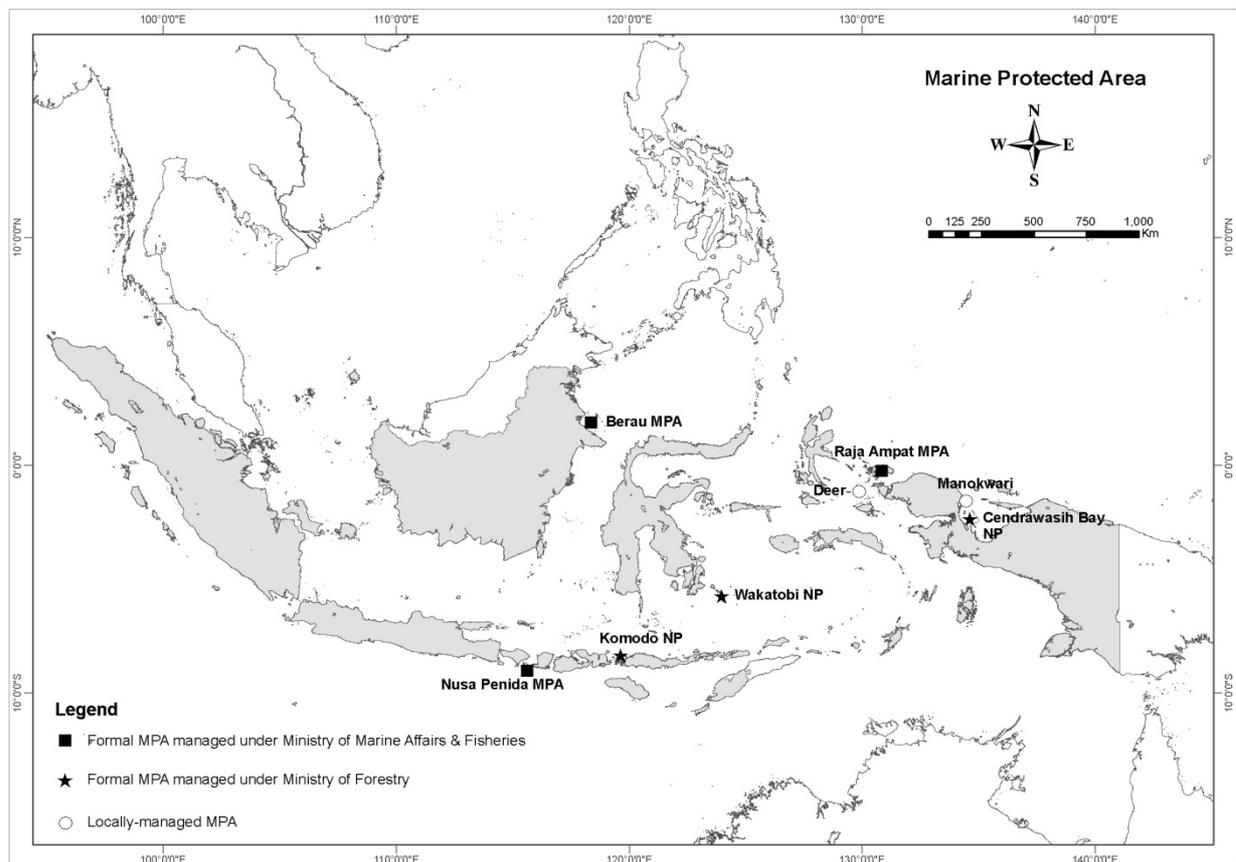


Figure 1. MPA study sites (field visit to Cendrawasih Bay National Park and Nusa Penida MPA were held in 2009; all the rest were completed in 2008).

### RESULTS

Until the end of 2007, government of Indonesia has enacted four National Acts related to protected areas, include MPA's component. The main legislation was National Act No. 5, 1990 on Conservation of Biodiversity and its Habitats, with mission statement to protect biodiversity by conserving their natural habitats. This legislation is very centralistic. Despite the MPA was located within the jurisdiction of local government, MPA authority is under sub-ordinate of central government in Jakarta (Ministry of Forestry). There were five MPAs under this

legislation and four were fit to IUCN-MPA categories. National Act No. 27, 2007, on Management of Coastal and Small Islands proposed another four types of MPA, with main objective to conserve coastal areas and small islands through development of marine tourism. National Act No. 31, 2004 on Fisheries introduced MPA as a tool for fisheries management (Article 13) as the counterpart of the already existing fisheries management tool. The main goal was to sustain marine fisheries and avoid fisheries collapse. In this legislation, central government shared power and responsibility with local government in the management of MPAs. There were four types of MPAs identified under this legislation; three MPA types can be managed by local government. Political pressure following economic crisis in 1998 has forced central government to share power with local government. Central government launched National Act No. 32, 2004 on Local Government. Under this legislation (Article 18), local government was given a mandate to manage MPA that within their jurisdiction (0 – 4 nm for District Government; 4 – 12 nm for Provincial Government). So far, there were 15 different names exist in Indonesia refer to as MPA. The principle management authority were Ministry of Forestry, Ministry of Marine Affairs and Fisheries and MPAs those managed by local governments (district or provincial governments).

### **Sasi Laut**

The real history of Sasi Laut could not be traced back; there was no village (formal) leader or community members who can provide information on the initiation of Sasi Laut. Both locally-managed MPAs (Deer and Manokwari) are owned by village members and considered as common property. They practice an open-closed MPA system. Village leader, together with Church and community prepare a ceremony for the opening of Sasi. During the procession, all community are well informed on the period of Sasi open to community and the rules of extraction, including tax charged. Village leader records each user who will pay a portion of tax from the sale of the fish. Also, he/she will act as Sasi authority, includes enforcement of Sasi's rules. Village leader confirmed that there was no experience on violation of MPA rules by local community.

National Parks under Ministry of Forestry

Komodo National Park was established in 1980, ten years prior to National Act No. 5, 1990. The park consisted of terrestrial area with main objective to protect Komodo Dragon, and the adjacent marine areas, totaling around  $180 \times 10^3$  ha. In 2000, park authority revisited the zoning plan in connection with 25-year Management Plan of the park. All the park regulations took effect since 2001. Park authority formed a joint patrol team, consisted of park authority, police and navy. Enforcement team paid more attention to deer poachers in the terrestrial part of the park. Marine patrol was done through a floating ranger station (a wooden boat around 30 GT equipped with small dinghy).

Regular marine patrol inside the park started in May 1996. The main objective of the patrol was to combat destructive fishing practices (fishing with dynamites and potassium cyanide). As the enforcement being operated, park authority observed significant decrease in destructive fishing activities. Patrol team then continues to just focus on destructive fishing and hardly pay attention to zoning, especially No-Take Zone (NTZ). As the consequence, fishermen continue to concentrate inside NTZ, and over-exploiting the fisheries.

Wakatobi National Park was officially declared in 1996, covering only marine area with total area of  $1.3 \times 10^6$  ha. Zoning that attached to Management Plan was finalized in 2001, but revisited and completed in 2007. NTZ covers only 3% of total park area, but includes 30% of critical habitats, such as coral reefs, mangroves and sea grass. With an outreach period of one year, NTZ was fully enforced since 2008. Park authority showed a decreased incidence of fishermen who fish inside NTZ (result of resource use monitoring activities). Destructive fishing practices (blast fishing and potassium cyanide) were pressed down to almost negligible incidence.

Cendrawasih Bay National Park is located at the most eastern part of Indonesia. The park was initially designated in 1990 but officially declared in 2002. It covers only marine area with total area of around  $1.4 \times 10^6$  ha. Until the end of 2008, zoning together with Management Plan were still in the process of negotiation with local community. The park received least financial support and technical expertise from central government in Jakarta. Number of park staff per ha of park area was the least compared to both Komodo and Wakatobi National Park.

### **MPAs under Ministry of Marine Affairs and Fisheries**

As National Act on Fisheries was launched in 2004, Berau was the first district that designates a MPA at the end of 2005. Legal basis for this MPA was National Act No. 31, 2004. In 2007, District Raja Ampat designated a network of MPA that consisted of six separate MPAs. District authority used National Act No. 32, 2004 as legal basis for their MPA indicating that it will be closely managed by local district government. Nusa Penida MPA was declared in 2010 following long preparation since 2003. However, their zoning plan was just recently completed with wide stakeholder participation. Where as the two former MPAs has no zoning plan in place.

All of these three MPAs have nor Management Plan in place, neither management body. Hence the governance system could not be evaluated. Berau and Raja Ampat conducted regular monitoring on resource use with intensive support from international NGOs. More occasionally, Nusa Penida MPA conducted resource

use monitoring with dominant support from local dive operators and with active participation of local community.

Table 1 Characteristic nature of each MPA site

No	Main characteristics	Locally-managed MPAs		MPAs managed under Ministry of Forestry			MPAs managed under Ministry of Marine Affairs and Fisheries		
		Deer, Kofiau Papua	Manokwari Papua	Cendrawasih Bay NP	Wakatobi NP	Komodo NP	Berau MPA	Raja Ampat MPA	Nusa Penida MPA
1	Year of establishment	Not known	Not known	2002	1996	1980	2005	2007	2010
2	Letter of enactment	Local (verbal) agreement	Local (verbal) agreement	Ministry of Forestry	Ministry of Forestry	Ministry of Forestry	Bupati District Berau	Bupati Raja Ampat	Bupati District Klungkung
3	Legal basis	Local-customary law	Local-customary law	National Act No. 5, 1990	National Act NO. 5, 1990	National Act No. 5, 1990	National Act No. 31, 2004	National Act No. 32, 2004	National Act No. 31, 2004
4	MPA characteristics	Marine	Marine	Marine	Marine	Marine & terrestrial	Marine	Marine	Marine
5	Total marine area	< 50 ha	< 50 ha	1.4*10 <sup>6</sup> ha	1.3*10 <sup>6</sup> ha	1.2*10 <sup>5</sup> ha	1.2*10 <sup>6</sup> ha	8.4*10 <sup>5</sup> ha	2.0*10 <sup>4</sup> ha
6	Zoning system	All are No-Take Zone (NTZ)	All are No-Take Zone (NTZ)	Multi-zone with NTZ < 5%	multi-zone with NTZ < 5%	Multi zone with NTZ > 50%	In progress	In progress	Nearly finalized
7	Management body	Local leader	Local leader	BTN	BTN	BTN	NA	NA	NA
8	Management plan	NA	NA	completed	completed	completed	NA	NA	NA
9	Regulation on restricted use	verbal	verbal	Ministry's Decree	Ministry's Decree	Ministry's Decree	NA	NA	NA
10	Enforcement	Occasional	Occasional	Occasional	regular	regular	Occasional	occasional	occasional
11	Level of compliance	Very high	Very high	Low	High	Low	-	-	-
12	Protection scheme	Open & close	Open & close	Permanent closure	Permanent closure	Permanent closure	Planned for permanent closure	Planned for permanent closure	Planned for permanent closure

## DISCUSSIONS

Local community surround both locally-managed MPAs (Deer and Manokwari) highly complied all regulations on Sasi Laut. There might be two reasons for this very high obedience – first, the MPA was selected out of places that considered hallow by local community. Even only passing Sasi, if it was done during close season, it can be considered as taboo. This psychological pressure avoided local members to violate the Sasi rules [4]. Secondly, penalty for every violator would be decided through community meeting with village leader, and this meeting was considered very taboo – community would perceive violator very humble. Communities in Raja Ampat and Manokwari have long traditional experience in practicing MPA through Sasi. This may trigger a better management of newer and bigger MPAs established surround Papua with different management authority [3].

MPAs that managed under Ministry of Forestry are considered very centralistic – most decisions regarding MPA management were under the control of central institution in Jakarta. Local MPA authority acted more as implementing agency. Blue print or MPA system plans that include site selection in Indonesia was prepared through intensive surveys held between 1980 and 1984. It seems that the surveys [5][6][7] and development of site selection criteria were conducted by mainly scientists [8][9][10]. Local governments (the districts this survey was done) did not aware on the national MPA system plan. As the consequence, MPA authorities faced refusal problem by local communities and users, especially in the enforcement of MPA regulations [11]. To gain local support, Ministry of Forestry should reformulate their operational policy toward local engagement.

Studies showed that most of Indonesia's capture fisheries are either full or over-exploited [12][2][13]. Policy formulation workshop commissioned by Ministry of Marine Affairs and Fisheries [14][15][16] conclude a comparable advice. Under current fisheries status, every government plan to increase fishing effort can be considered as flawed, putting sustainability and long-term profitability of Indonesia's fisheries at risk. Furthermore, most of coastal habitats that support fishery stocks are degraded due to destructive fishing practices [17][18][19][20] – More than 70% of coral reefs are under stress condition and total mangrove area is declining every year. Indeed, as common in Southeast Asia, marine resources in Indonesia are seriously

threatened by destructive and over-exploitation [21]. So, the current conventional fisheries management tool may not enough to prevent marine resources from over-exploitation and habitat degradation [22].

Where fisheries are heavily exploited (over-exploitation), setting aside and protecting some critical areas as MPA could replenish the surrounding fisheries [23][24]. This could be done through mainly two mechanisms: spill-over of recruits and export of eggs-larvae to the adjacent fishery [25][26]. Also, MPAs could protect and hence, improve habitat quality available to support fisheries [27]. It was very strategic and appropriate when Government of Indonesia decided to use MPA as fisheries management tool, coupled with the currently existing tool. So, the new national Act on Fisheries introduces MPA as an approach to fishery management. A MPA, of course, should meet certain criteria to provide benefit for fisheries [28][29]. This need proper knowledge and experience on design, selection and management of MPAs.

This study showed that MPAs in Indonesia do not reach the objective to improve adjacent fishery. Over-fishing would result in reduced catch, and fishermen have to find other places to fish. MPA is characterized by the presence of sizeable No-Take Zone (NTZ). As MPA becomes mature, there will be more and bigger fish inside NTZ compared to fished areas. Fishermen would always stay close to un-fished areas and even tend to enter NTZ. This was the main difficulty to strictly implement MPAs when surrounding fisheries are heavily exploited. MPA authority will need intensive resources to maintain their presence in the field, to enforce all MPA rules.

In conclusion, MPAs in Indonesia may function in two ways: to protect marine biodiversity that meet global value and to maintain sustainable utilization of marine resources, especially marine capture fisheries. The study showed a lesson learned that Sasi Laut regulations were highly obeyed by local user. This experience has the potential to support implementation of different MPA types in Indonesia. MPAs managed under Ministry of Forestry seem to be centralistic, with minimum involvement of local government and stakeholders. MPAs that managed under Ministry of Marine Affairs and Fisheries has the opportunity to involve more and wider stakeholders. However, these MPAs were still in early phase and immature; so there was no success story that can be outreach to public regarding positive impact of MPAs to fisheries.

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