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**Integration of Marine Resources Management Based
Customary into Modern Conservation Management in
Raja Ampat, Indonesia.**

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Abstract

Integration of indigenous-based management of marine resources with modern conservation in Raja Ampat is one model of MPA approach to achieve the objectives of management. This research aims to describe the adaptations that occur in conservation management aspects, namely: zoning, institutional forms, and surveillance. The different types of conservation management in Raja Ampat are: 1) marine nature reserves; 2) traditional conservation management (SASI); 3) marine conservation areas (regional MPA). The types of zones that are established in the Regional MPA consists of six types namely: 1) core zone, 2) food safety and marine tourism zone, 3) sustainable fishing and aquaculture zone, 4) ship cruise lines zone, 5) the use of traditional and sasi zone, 6) the use of other zone.

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Regional management of MPAs in Raja Ampat is a combination of limited use and no-take marine resource. Management institution is collaborative management between local government and indigenous communities and supported by NGOs. Indigenous people are directly involved in surveillance and monitoring, thereby successful in reducing the level of violation in the conservation area. Involvement of indigenous peoples in the management of protected areas in Raja Ampat is the key to successful implementation of the MPA.

Keywords: Conservation; customary; integration; Raja Ampat

1. Introduction

The waters of Raja Ampat is part of the "world's coral triangle", which found as many as 553 species of coral biodiversity and reef fish of more than 1320 species [26,1]. In general, the condition of the coral reefs of Raja Ampat in very good health condition [14]. Nevertheless, the region is threatened by various activities of marine resource use and physical development activities on the mainland. Some issues about the destruction of coastal ecosystems in the region include: 1) fishing using explosives, potassium, and overfishing [13]; 2) the destruction of forests due to logging still occurs; 3) mining operation carried out can damage existing ecosystems when it is done without regard to the surrounding environment; (4) sand mining is carried out in the area of the conservation area; (5) the construction of the road that passes through protected areas [19].

One resource management tool used to prevent depletion of marine resources in Raja Ampat is the establishment of marine protected areas. But conservation management approaches and management of fisheries resources in Indonesia have tended to be centralized or top-down, where all stages in the process of establishing and managing protected areas comes from the central government, especially the Ministry of Forestry [5]. Management approaches often adopt modern science in the management of protected areas, rather than local knowledge living in the local community for generations. As a result, local communities and local governments do not support the implementation of conservation and management of many protected areas fails to achieve management objectives [12].

As with the general public who live in the South Pacific region that recognize traditional marine resource management in the form of taboo, the indigenous people who live in the Raja Ampat Islands recognize the culture called *sasi*. Conservation management system is very effective to sustain important fisheries resources such as sea cucumbers, trochus and lobsters. At the village or island that is still practiced *sasi*, shows the fisheries resources are still relatively easy to find compared to areas that are no longer practiced this system [16]. In the implementation of indigenous-based natural resource management does not escape also from various drawbacks associated with human impact. The decline resource protected by the SASI include: increase in the number of people in the coastal villages, the decline in agricultural commodity prices, changes in fishing techniques, increased income to pay the debt, and the destruction of coastal habitats [23].

For these reasons, efforts to integrate management approaches undertaken by modern science-based government with customary management based on local wisdom *sasi* be a very wise choice in enhancing the successful management of marine protected areas in Raja Ampat. Conservation model that integrates both

approaches being implemented in Raja Ampat, especially in the form of networks of marine protected areas 5 locations. Management authority is the Office of Fisheries and Marine Affairs and implemented by the Regional Technical Implementation Unit of Small Islands Park of Raja Ampat.

This research aims to describe the adaptive management of marine reserves that occur through the integration of indigenous-based management of fisheries resources with the modern management of water conservation in Raja Ampat. The adaptation is the conservation zoning, institutional forms, and community involvement in supervision.

2. Research Methods

2.1. Location

The study was conducted in a conservation area waters of Raja Ampat, which is located at position $2^{\circ} 25'$ north latitude - $4^{\circ} 25'$ south latitude, and from 130° to $132^{\circ} 55'$ east longitude, has an area of approximately 6084.5 km². Location of the research conducted in the region 5 regional MPAs in Raja Ampat, namely: Ayau-Asia, the Gulf of Mayalibit, Dampier Strait, Kofiau-Boo and Misool (Fig.1). In this area there are a collection of 600 islands large and small. The population of Raja Ampat in 2010 as many as 42,508 inhabitants with density 5.29 people per square kilometer [29]. Most of the populations in this region depend on the fisheries sector.

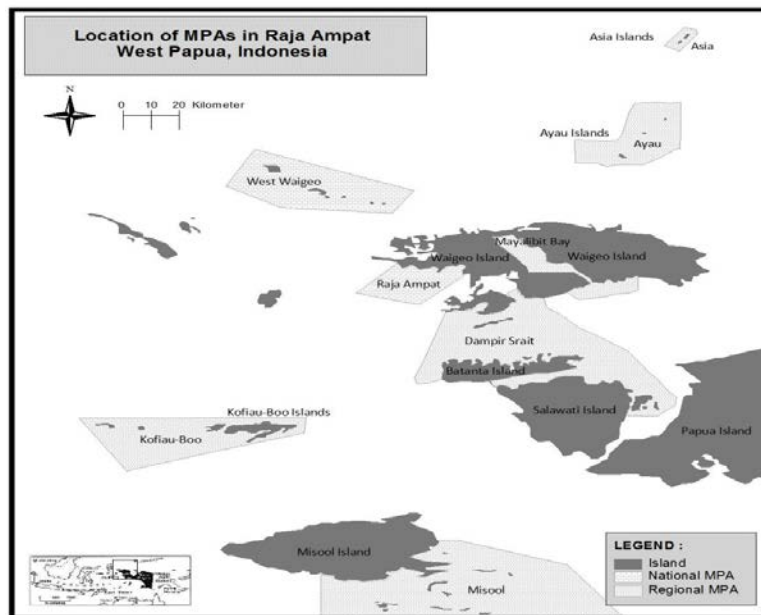


Figure 1. Locations of marine protected areas in Raja Ampat

2.2. Data collection

The data taken in this study is primary data and secondary data. The collection of primary data through interviews with purposive sampling and questionnaire respondents, and field observations. Respondents selected were local residents, community leaders, religious leaders, traditional leaders, village government, local

government and NGO activists. Secondary data obtained from various agencies in the Raja Ampat included Statistics Office, Department of Fisheries and Marine Resources, Raja Ampat tourism bureau Department of Transportation and the Office of the Parliament Secretariat. In addition, data were also obtained from CI and TNC NGO Office and the Office of Coastal Loka respectively in Sorong. The experiment was conducted in 2 phases namely data collection: August-September 2012 and April-July 2013.

2.3. Data analysis

All the observations in this study were analyzed using descriptive statistics. The data obtained is shown in the form of graphs and tables. Description of quantitative data processing is supported and combined with field notes from interviews and open discussion groups and field observations as well as material from secondary data. In addition, an analysis of the situation done with contextual approach to describe events in the field. This analysis is important to understand the fullest possible picture of the regional MPA Raja Ampat.

3. Results

3.1. History and Management of Marine Conservation

The history begins with conservation management of biodiversity data collection coral reefs of Raja Ampat was conducted in 2001 and 2002. Results of the study showed high diversity of reefs in the region thereby increasing the attention of NGOs, local government and local communities. Tomolol Declaration of 2003 resulted in a strong commitment of indigenous peoples to participate Raja Ampat submit their customary rights to waters designated as marine protected areas based on indigenous peoples. In 2007 the local government of Raja Ampat, set the entry into force of the Regional MPA, through decree 66 of 2007 and later established by the Regulation No. 27 of 2008 on the Network of MPAs Raja Ampat. In 2009 the Technical Implementation Unit established Department of Marine and Fisheries Regional Marine Conservation Area through the Regent of Raja Ampat Rule 16.

In 2010 Raja Ampat Government supported NGOs to formulate regional zoning of MPAs in Raja Ampat. One important approach in preparing zoning is to adopt community land tenure Raja Ampat. Submission of certain areas belonging to indigenous resource to be included as one zone in the zoning system becomes important so that the necessary declarations in each location MPAs Raja Ampat in 2011 until 2012. In the Year 2012 to the present management plan has been developed around the existing MPA Regional Park in the form of Coastal and Small Islands Region (TPPKD) Raja Ampat and efforts to improve the status UPTD under KKP Raja Ampat Agency Management Board TPPKD be directly under the Regent Raja.

In Raja Ampat currently has imposed three kinds of marine protected areas, respectively, are as follows: 1) marine nature reserves; 2) Management of traditional protected areas or SASI; 3). regional marine protected areas regional (MPA). Management of marine nature reserves (SAP) managed the central government through the Ministry of Maritime Affairs and Fisheries. Local communities themselves have applied traditional conservation management, known as *sasi* as a form of protection against marine life such as trochus. Regional MPAs management model is a combination of government-run management with traditional conservation

management. This conservation is managed by the local government of Raja Ampat together with the local community.

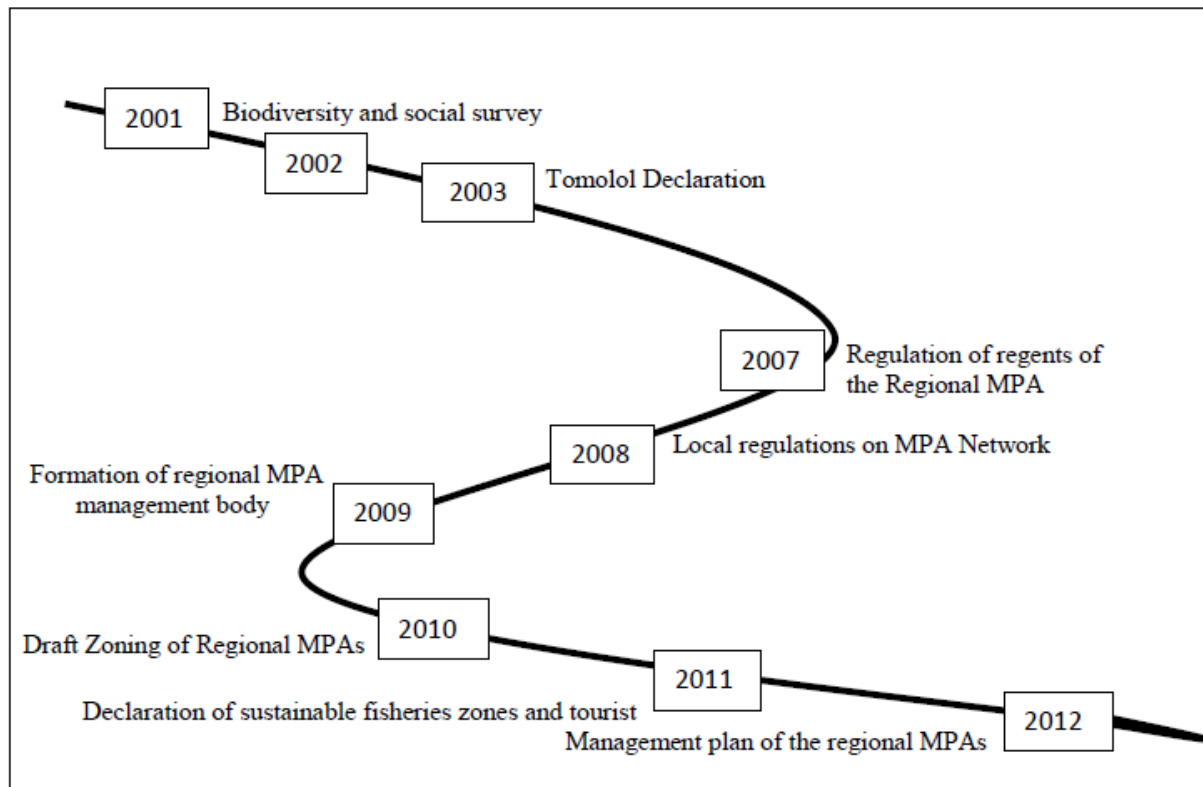


Figure 2. History of regional implementation of MPAs in Raja Ampat

3.2. Zoning

In general the of KKPD zoning in Raja Ampat is based on the Regulation of the Minister of Marine Affairs and Fisheries of the Republic of Indonesia No.17 Year 2008, consisting of: a core zone, restricted use zones and other zones. The results of in-depth consultations with stakeholders, including indigenous people in Raja Ampat MPA produces 6 types of zones. The main principle in considering zoning in the region namely: aspects of the ecosystem; aspects of social, economic and cultural local community; and governance aspects. Moreover, the division of zones take into consideration the wide area which meet optimal marine life, that support the sustainability of marine ecosystems and the local community food (Pollnac and Seara, 2010; Forcada et al 2008). As for the types of regional MPA zone imposed in this area consists of six types namely: 1) core zone, 2) food safety and marine tourism zone, 3) sustainable fisheries and aquaculture zone, 4) lines ship cruise line zone , 5) traditional use and sasi zone, 6) the use of other zone (Table 1).

Core zones in the regional area of MPAs is an area considered by local culture as sacred (taboo) and is forbidden to enter. Area of the core zone in each MPA is the smallest, the extent of not more than 2 percent of the total area of MPAs, even in the Regional MPA of Kofiau-Boo does not have a core zone. The existence of this zone is to accommodate the belief systems of indigenous peoples who still think that the area is guarded by

supernatural powers. This zone is only for research activities. The results of several studies in this area found some charismatic marine species such as manta rays and dugongs [30].

Table 1. Type and extent zone of Regional MPAs of RajaAmpat

Detail Zone	Regional Marine Protected Areas of Raja Ampat (ha)				
	Ayau-Asia	Dampier	Mayalibit	Misool	Kofiau-Boo
Core zone	846	3,986	609	750	0
Food safety and marine tourism zone	10,169	69,800	14,982	79,890	17,200
Sustainable fisheries and aquaculture zone	36,517	193,548	1,398	6,700	4,100
Zone cruise line ships	7,204	11,400	0	0	0
Sasi and traditional use zone	44,791	47,976	34,734	262,590	130,500
Other utilization zone	1,913	9,290	1,377	16,070	18,200

Source [30]

The next zone is a specific regional MPAs Raja Ampat namely food security zones and marine tourism or often called a zone of fish savings. Stipulation of this zone was through the declaration together with all the customary owners of the conservation area, to hand over their customary lands to local governments. Marine resource extraction activity is not allowed (no take zone), however marine ecotourism activities are allowed. This zone is intended to preserve coastal ecosystems where natural habitat, spawning and feeding grounds of manta rays and other species, maintaining biodiversity of fish and other marine life. If the optimum conditions have been achieved in this zone, will be cause spill-over effects to other zones.

Other zones that characterizes the zoning system of marine protected areas in Raja Ampat is sasi and traditional use zone. This zone is intended for local people who still utilize traditional fisheries with fisheries management.. This zone is designed for local people who still utilize traditional fisheries with fisheries management. There are 2 models of fisheries management in this zone are: 1) the management of sasi, and 2) the use of traditional fisheries. Sasi is a fisheries management system by closing the fishing area catching certain of marine biota (sea cucumber, trochus and lobster) in a certain time interval (6-24 months). The purpose of the sasi is to provide opportunities for biota populations achieve optimal harvest size. The method allowed to fish in this zone is traditional fishing with spear fishing gear (*kalawai*) and fish arrows (*jubi*), and diving glasses (*kacamolo*).

3.3. Institution

The Regional MPAs of Raja Ampat is a collaboration between local government and local communities. Its institutional is the Regional Technical Implementation Unit (RTIU) under the Office of Fisheries and Marine Affairs Raja Ampat. The institution set through regulation regent (Perbub) No. 7 in 2011. Establishment was strongly supported by institutional indigenous peoples Raja Ampat, pearl farming firms and managers resort diving. Management is done by the system of marine protected area networks consisting of 5 Regional MPAs

called Regional Small Islands Park (RSIP) of Raja Ampat. RTIU RPSI of Raja Ampat is the first example for the management of institutions set up for regional MPA networks by Indonesian government regulations.

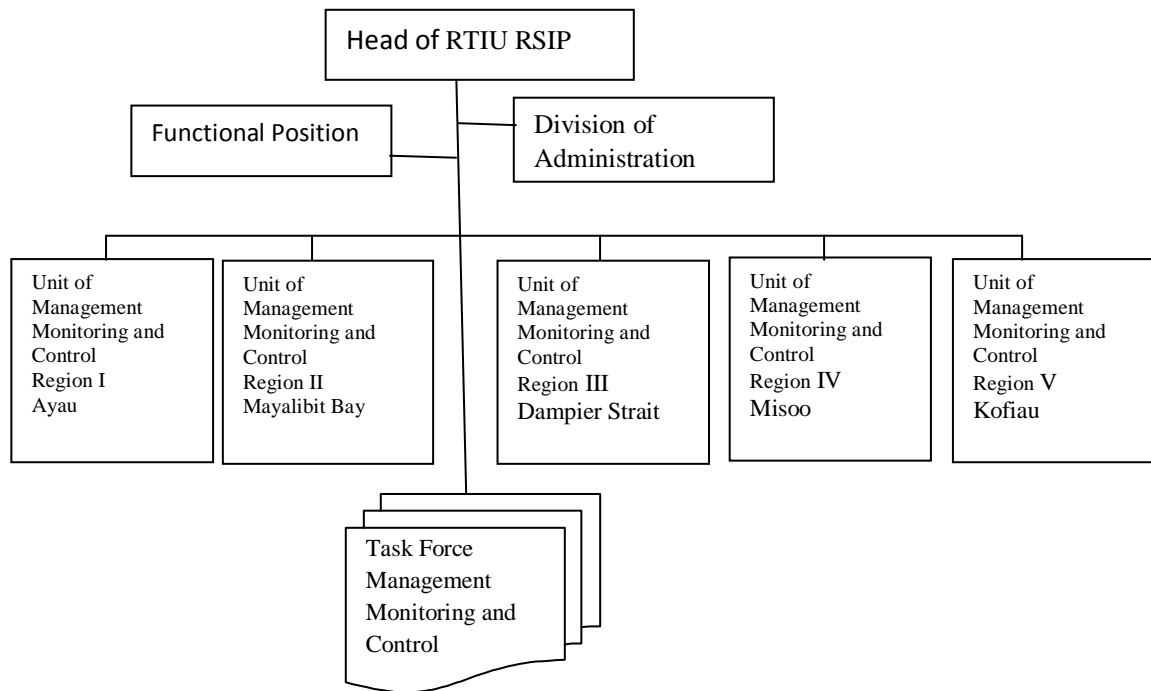


Figure 3. Management Board Structure of Regional Small Islands Park of Raja Ampat

The structure of the management body consists of: 1) leader Small Islands Raja Ampat Park, which includes 5 regional MPAs, and 2) management unit in each regional MPA. The duties and authority head of RSIP as follows: 1) formulate technical policy in the field of management, supervision and control; 2) carry out the management, supervision and control; 3) coordinate the task of managing, monitoring and controlling the technical agencies and stakeholders; 4) develop a program of economic empowerment of the people inside; 5) develop human resources development program; 6) carry out cooperative research and development of marine ecosystem science; and 7) other tasks given by the Regent. Furthermore, for the head of unit from each regional MPA acts as a coordinator in coordinating all stakeholders related to MPA management in the coastal zone, marine, and small islands in the MPA.

3.4. Involving Communities in Surveillance

Supervision of conservation areas involving local communities goes very well in this area. The involvement of indigenous (local) becomes an important requirement in achieving management effectiveness of MPAs in Raja Ampat. Public watchdog group in each regional MPA consists of 1 supervisor coordinator from management body, and as many as four members of supervisors come from the local community. Supervisors from the local community are the choice from the head and the people from village. The local Supervisors in charge and stayed for 6 days in the observation post, which is far from village. After ending the surveillance schedule is replaced by a group from another village. Each village gets the next turn after 2 to 3 months. The number of

member of supervisors team in every village more than 15 people, therefore the next surveillance done by other members from group in the village.

The task from supervisors are: 1) conduct patrols in the region and outside the region; 2) carry out monitoring resource use and collect data; 3) following the training held in each observation post; and 4) Comply with the duties and rules in the post surveillance. Surveillance does every day from morning until late afternoon. Prosecution of violations follow the following requirements: 1) must be agreed upon by the three pillars of the main stakeholders at the village level, the government, religious leaders, and traditional leaders; 2) action by officers patrolling for violators are a warning, to make a statement not to repeat the same actions, and should get out from the area; 3) while the actions taken by the government of village include: penalties, seizure of proof, handed over to police.

4. Discussion

Development of conservation areas in Raja Ampat is the impact from the international movement to preserve ecosystems on earth. There are currently more from 100,000 protected areas in the world, covering more from 12% of the world's land surface [3]. While the number of marine protected areas (MPAs) has risen sharply, from just 118 in 1970 to more from 6300 today [25]. The Government of Indonesia has also launched the development of marine protected areas by targeting the marine conservation area of 20 million hectares in 2020, and until 2013 conservation area in the waters of Indonesia has reached as many as 131 at a national level and wide area reach over 15 million hectares [10].

The success is largely determined by the MPA to form the active participation from indigenous peoples in the region. Since the early initiation of MPA done by the NGO Conservation International (CI) and The Nature Conservancy (TNC) regard indigenous peoples as an important part from success in achieving conservation goals. The steps taken by the initiator in line with suggestions [22] as follows: a) identification of community leaders who will participate in the project; b) to protect coral common consensus through discussion among local stakeholders, NGOs and scientists coral reefs; c) involves elements of the government to obtain the status of an MPA; d) submit to the decision of the central government; e) continue the process of solving problems between the government and stakeholders.

To achieve effective conservation management in Raja Ampat, conservation practitioners must be careful because the MPA that rely on the involvement of various stakeholders including indigenous peoples is complex and requires good planning that stakeholders make a positive contribution in the area management [4] . In indigenous-based management is always associated with the social aspects of the issue which always appeared genuine recognition and community involvement in the management [18]. In determining the legal status of a conservation area should be intensively consulted and received approval by the local community, they always want to control the protected areas that affect the daily livelihood [9].

Integration of natural resource management based on customary with modern conservation lies in public awareness of the importance of indigenous Raja Ampat in maintaining the biodiversity of Raja Ampat's marine

resources. In addition, an understanding of the central government and local governments to Raja Ampat is an important position from indigenous stakeholders in supporting the successful management of marine reserves. They are involved through intensive discussion about the type of zone that will be enforced to its management model. This is in accordance to [24], the success of integrating local knowledge and culture is the key to successful management of conservation in Hawaii. In line with this, [17] concluded that the management of protected areas, including indigenous people and promote genuine issue of people's lives will be successful in achieving conservation goals.

The Raja Ampat conservation management applies the combination approach of limited use, and no-take marine resources. This is similar to the general model of conservation management in Latin America and the Caribbean [10]. The extraction of fishery resources in the zoning of MPAs in Raja Ampat found in: 1) sustainable fisheries and aquaculture zones, and 2) zone and the use of traditional sasi. In sustainable fisheries and aquaculture zones, fishery resource extraction must be done with techniques and tools that are environmentally friendly, while in sasi and tradition use zone more emphasis on traditional management conservation called sasi and using gear that still very traditional such as spear. Meanwhile, no-take areas in the marine resources encountered in: core zone and food safety and marine tourism zone. Utilization for marine tourism is very emphasis on this zone.

Management of marine protected areas in Raja Ampat is not much different from the problems like that of other marine protected areas. MPA main problems are: 1) lack of coordination between government agencies; 2) limited economic resources, 3) lack of patrol and surveillance, 4) management of water resources that low, and 5) changes in vulnerable coastal [2]. Associated with patrolling and surveillance protected areas in Raja Ampat, the involvement of local communities is very well. Since the initiation of protected areas involvement of indigenous (local) becomes an important consideration in achieving successful management. Conservationists realized that many protected areas in developing countries do not have good prospects in the future without the cooperation and supported by the local population [27]. None of the MPA can be successful without the support of the local community [8]. The role from community groups in monitoring the resources is increasing and significant role in the protection and management of marine resources in Australia [11]. Direct involvement of the community in maintaining protected areas in Raja Ampat has increased their awareness of the sustainability of marine resources become the foundation of their livelihood. Therefore, people will obey the rules imposed because of management meets their expectations that in line with conservation objectives [15].

5. Conclusion

Based on the description and discussion of the results concluded that an integration of the management of SASI with conventional management of marine conservation in Raja Ampat. The success of forming and implementing protected area in this region is determined by the active participation of indigenous peoples. Regional MPA management office in the Raja Ampat is a collaborative management between local government and indigenous peoples. The involvement of indigenous peoples in surveillance and monitoring can reduce violations that occur within the marine protected area. Currently managing funds in Raja Ampat MPA derived from donor assistance, but with the effective management and utilization of ecosystem services better, then funding can be achieved autonomously.

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