

Benefits of *Sasi* for Conservation of Marine Resources in Raja Ampat, Papua

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Abstract

Residents of Raja Ampat, Papua, have been practicing *sasi* for generations to manage local marine resources. Recognizing its importance for marine resource conservation, efforts have been made to integrate *sasi* into current conservation management approach. This study was carried out with 3 objectives: (1) to define and elaborate *sasi*; (2) to examine the benefits of *sasi* for conservation of marine resources; and (3) to evaluate the change of *sasi* in the context of conservation. Multi-method approaches were employed to collect data from local communities in Dampier Strait District MPA in 2 separate sampling periods. Results indicated that *sasi* in Raja Ampat could generally be categorized into *samson* or *kabus* which basically reflect different aspects such as location, type of commodity, implementing ceremony, period of closure, the influence of monsoons, and communal ownership. The benefits identified included the increase in target fish production, the lowered level of exploitation, the improved recovery of fish stocks, and the increase in the local people's income. From the modern conservation management point of view, it was obvious that *sasi* could help protect and sustain marine biological resources. Therefore, it is essential to incorporate *sasi* into modern conservation management practices and vice versa.

Keywords: *sasi*, traditional management, benefits, conservation

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Introduction

As in other regions in Indonesia, Raja Ampat's coral reefs are severely threatened by various activities of marine resource utilization by local residents and migrants. Some of the issues that threaten the existence of coral reefs in this area are fishing with explosives and potassium, overfishing and the influx of nutrients and sediments into waters due to deforestation and land clearing for settlement (Larsen *et al.* 2011). The effort made by the local government to prevent the depletion of marine resources in Raja Ampat is by employing good fishing management such as applying restrictions on fishing equipment and areas. In addition, the Raja Ampat District Government and the Ministry of Marine Affairs and Fisheries of the Republic of Indonesia since 2006 have initiated the establishment of regional marine protected areas. The problems that can still be found in the management of marine-based conservation in this region are: (1) the role of the government is more dominant than the community's role, (2) the central government often ignores the customary rights of local communities, (3) management of protected areas is based only on modern science, disregarding local

wisdom (local knowledge and technology) (Damanik *et al.* 2006).

One form of local wisdom in Raja Ampat which has the potential for conservation is *sasi*. *Sasi* is the spatial and temporal closure of an area of natural resources in the form of agricultural fields (gardens), forests, coral reefs, and fishing locations (Thorburn 2000). The area closure is intended to give a chance for certain animals or plants to grow and thrive in order to produce more crops (Mansoben 2003). The results of the research conducted by McLeod *et al.* (2009) in this area has demonstrated that the villages which still maintain the practice of *sasi* have better marine resource conditions compared to villages which have already abandoned the practice. This study is supported by a previous study by Hickey & Johannes (2002) and Novaczek *et al.* (2001) which showed that the spatial and temporal closure of the waters for trochus harvesting for certain lengths of time in coastal villages have been far more profitable than continuous trochus harvesting practices.

Management of natural resources based on this custom has received significant attention as a potential conservation

and the nature conservancy (TNC) NGO Secretariats and the Office of Coastal Affairs in Sorong. The study was conducted in two data-collection stages: August to September 2012 and April to July 2013.

Data analysis All the observation results obtained in this research were analyzed using descriptive statistics. The data obtained were analyzed and displayed in graphs or figures and tables. The description of quantitative data was supported and combined with a review of field notes from interviews and field observations as well as material from secondary data. In addition, an analysis of the situation was done using a contextual approach to explain events in the field. This analysis was important to obtain a complete description of the research location.

Results and Discussion

The *sasi* system in Raja Ampat Natural resource management using the *sasi* system is still found in almost all the villages in the study site. The location of the implementation of *sasi* is an area of customary ownership of a village or clan groups in the form of bay waters, capes and small islands. *Sasi* in Raja Ampat is one of the expressions of customary rights of clans (tribes) on marine resources (McLeod *et al.* 2009). Natural resource management practices like this are also found in the Indo-Pacific region (Lam 1998; Cohen & Foale 2013). *Sasi* is an example of a social institution established to safeguard the utilization of natural resources in the form of prohibiting residents from harvesting forest or marine products in a certain place for a certain duration (Mansoben 2003; Adhuri 2013). The final goal of the implementation of *sasi* for local communities in Raja Ampat is harvesting the marine resources with a higher yield both in quantity and size, as well as generating a large amount of cash revenue (Handayani 2008).

Every ethnic group in Raja Ampat has their own terms for *sasi*. The Maya people who live in Dampier Strait call *sasi kabus*, while the Matbat people who dwell on Misool Island call it *samsen*. In other Papua regions such as Biak and Jayapura, it is known as *sasisen* and *tiatiki*, respectively (Mansoben 2010). In Kupang, East Nusa Tenggara, the practice of temporary closure of an area is known as *lilifik* (Anakotta *et al.* 2009). *Sasi* itself is a well-known term in the management of natural resources in the Moluccas (Wahyono

et al. 2000). In the Pacific region where the indigenous culture still retains ownership, *sasi* management is also known as *taboo* in Fiji (Lam 1998), *tabus* in Vanuatu (Caillaud *et al.* 2004), and *tambu* in Solomon Islands and Papua New Guinea (Foale & Manele 2004).

The types of *sasi* found in the Dampier Strait and Raja Ampat in general are shown in Table 1. The types of *sasi* are each distinguished based on the location, the type of commodity, the institution which performs the ceremony, the closing and opening times, communal tenure (Monk *et al.* 1997; Adhuri 2013), and the influence of the monsoons. Based on the location of the resources, whether they are found on land or at sea, *sasi* is classified into *land sasi* and *marine sasi*. Another type of *sasi* in Raja Ampat is always associated with a the type of agricultural or aquacultural commodity that has high economic value and is a major source of income for local communities such as coconuts, trochus, sea cucumbers, and lobsters. Therefore, the naming of *sasi* is tailored to the type of commodity. In addition, based on the establishment ceremony, *sasi* can be distinguished into *custom sasi*, if their establishment is based on a customary ceremony, and *church sasi*, if it is done with a church ceremony.

Other types of *sasi* known in Raja Ampat are based on the effect of the seasonal winds, customary tenure, and the implementation duration. Strong winds for several months in the waters of Raja Ampat do not allow fishermen to catch fish. This condition is referred to by local people as *season sasi* and the enactment of *sasi* will end as the windy season ends. Meanwhile, based on customary tenure system, *sasi* is distinguished into *clan (family) sasi* and *village sasi*. *Clan sasi* is applied to land owned by the clan usually in form of agricultural fields, whereas *village sasi* is implemented on an area which is community property of the village, for example, the waters in front of the village. Based on the time of implementation, *sasi* can be distinguished into *temporal sasi* and *permanent sasi*. *Temporal sasi* is implemented for a short period of time, approximately 3–24 months, whereas *permanent sasi* is implemented in a longer period of time or in an area that does not have any harvesting time. *Permanent sasi* is a system adopted from the modern conservation, which is a no-take zone.

The implementation of *sasi* can be classified into *open sasi* and *closed sasi* which can be done by a customary or

Table 1 The types of *sasi* found in the Raja Ampat

Aspects	Types of <i>sasi</i>
Location	<i>Land sasi</i> and <i>marine sasi</i>
Type of commodity	<i>Coconut sasi</i> , <i>trochus sasi</i> , <i>sea cucumber sasi</i> , <i>lobster sasi</i>
Implementing ceremony	<i>Customary sasi</i> and <i>church sasi</i>
Closed-open time	<i>Temporal sasi</i> and <i>permanent sasi</i>
Influence of the monsoons	<i>Monsoon sasi</i>
Communal ownership	<i>Family sasi</i> and <i>village sasi</i>

religious ritual or a combination of the two. *Closed sasi* is closing an area or prohibiting the harvesting biota from a certain area for certain length of time. On the other hand, open *sasi* is the opportunity to harvest marine resources in an area which was previously closed against resource utilization activities. *Sasi* is marked with palm leaves which are placed on the beach or Indonesian bay leaf trees which have had all of their leaves sheared off but the branches and twigs left intact and are planted facing the sea in front of the village and on each end of the village. Before the influence of Christianity and Islam, in Raja Ampat, the *sasi* ceremony was performed by a shaman known as a *mirinyo*. The *sasi* ceremony conducted using church rituals are basically the same as *custom sasi*, differing only in the prayers. The people believe that the prayers or mantras spoken by the priest or the shaman will invoke protection from supernatural powers which will protect the sea and punish violators of *sasi* with illness that will end in death. It is also believed that the mystical powers will provide food for the marine biota which will make the harvest abundant (Nikijuluw 1994; Mustaghfirin *et al.* 2012).

Sasi rules may include the types of marine life or fish that may be caught, the type of fishing gear used for harvest, the harvesting time, and number that can be harvested (McLeod *et al.* 2009). Most of the *sasi* areas forbid the harvesting of 2 commodities, sea cucumbers and trochus. The fishing equipment allowed in harvesting in *sasi* locations are only simple fishing equipment such as fishing poles, fish spears, and traditional diving goggles called *molo glass*. The utilization of fish resources for family consumption and earning cash can only be conducted beyond *sasi* areas. Catching fish outside of *sasi* areas must also use environmentally friendly fishing methods.

There is no specific institution or individual who oversees the local regulations in Raja Ampat. The rules are not written, but people are very observant of the rules or agreements made, and they are ready to be given sanctions if they break the rules. Violation of local wisdom will have terrible repercussions for the perpetrators, supernatural sanctions in the form of illness or death. Aside from the punishment above, other penalties can be imposed on *sasi* violators such as reprimands, monetary fines, confiscation of fishing gear and boats, and exile from the village. So far, *sasi* rules and sanctions for persons who violate them are still very effective in preventing and deterring violators in Raja Ampat (Handayani 2008).

The benefits of *sasi* for marine conservation Observations of fish production targets of *sasi* such as sea cucumbers, trochus and lobsters harvested from the Regional MPA of Dampier Strait until now has not yet been conducted because none of the *sasi* areas in this MPA have been opened. However, based on interviews and direct observations, there are indications of an increase in the number and size of protected biota. Some species of fish and protected biota such as sharks and turtles that were very rare before the establishment of *sasi* are now often encountered by fishermen and local residents.

Data about the increased fishery production is shown from the results of the *sasi* opening in the marine protected area of Kawe in Figure 2. In this picture, it shows that during the establishment the first period of *sasi* from the year 2007 to 2009, the number of sea cucumbers harvested by local fishermen was 12 species and 919 individuals. The total weight and average weight of individual sea cucumbers after processing were 88.5 kg and 0.10 kg, respectively. The

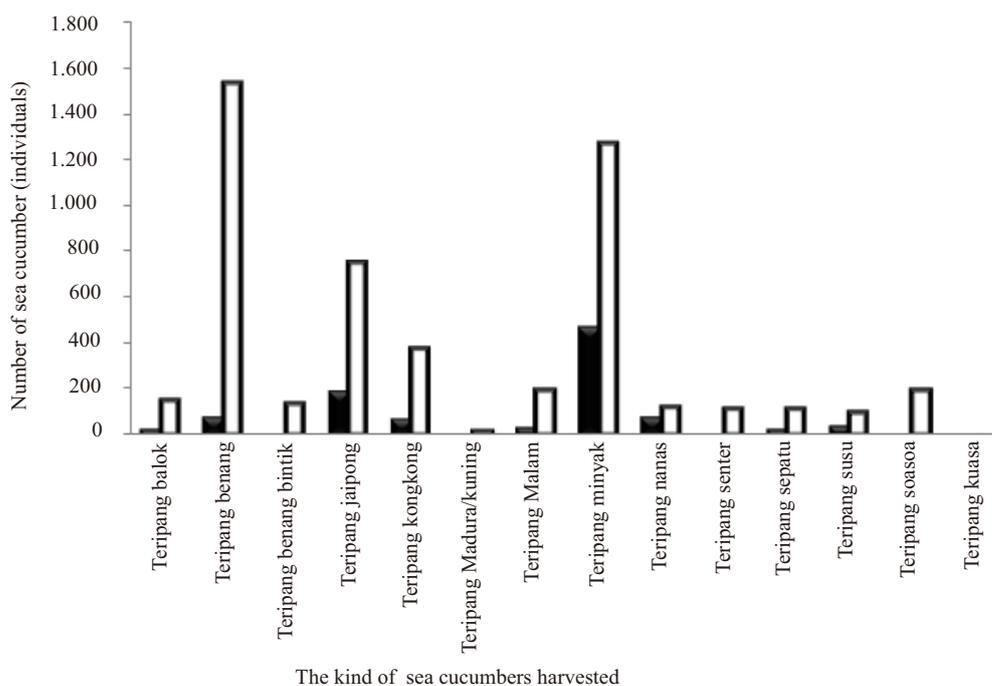


Figure 2 The number of sea cucumbers harvested during Kawe's *buka sasi* in 2009 and 2012.

establishment the second period took place between 2009 and 2012 which produced as many as 16 species of sea cucumbers and 5,067 individuals. The total weight and the average weight of individual sea cucumber after processing were 460.5 kg and 0.09 kg, respectively.

The implementation of *sasi* rules in an area in the waters of Raja Ampat which was previously overfished has increased production and improved stocks of sea cucumber, trochus, and lobster as well as protected marine biota. This outcome is in line with the opinion of Aswani & Sabetian (2010) who stated that closed areas have resulted in a threefold fish biomass increase in Vanuatu and a twofold increase in the Solomon Islands in comparison to areas that were not closed. Similar results were shown by Samoilys *et al.* (2007) who stated that there is a significant difference in the fish population, where it was better in protected waters than in unprotected waters. This outcome was consistent with the high abundance of trochus harvested in the Solomon Islands in an area which was closed for 9 months compared to areas which were not closed (Foale & Day 1997). This suggests that the *sasi* management model can be an effective tool to prevent excessive harvesting of fish resources that does not observe resource sustainability principles.

The implementation of *sasi* also has a positive impact on the trochus stock recovery in Raja Ampat. The observation of trochus stocks in the *sasi* location in the regional MPA of Kawe, during the open *sasi* in the 2009 to 2012 period is shown in Table 2. The trochus harvest in 2009 in an area which was closed for 2 years numbered 626 individuals with a total weight of 243 kg, and an average weight of 0.39 kg individual⁻¹. The number of trochus in 2012 increased further when the *sasi* location was closed one year longer than the previous period. The total number of trochus harvested was 1,285, the total weight 589 kg, and the average weight 0.46 kg individual⁻¹.

From the production data of *sasi* in the regional MPA of Kawe, it can be seen from the data for both sea cucumbers (Figure 1) and trochus (Table 2) that there is an indication that the longer an area is closed, the higher the numbers of sea cucumbers and trochus that can be harvested. This fact can lead to the conclusion that a fishery location would produce sustainable resources if it is never exploited. However, this method does not provide a direct economic impact on the local fishermen whose lives depend on fishing unless there are alternative livelihoods. The research by Cohen and Foale (2012) showed that in the Indo-Pacific waters, periodic closures will provide benefits for short-lived and fast

growing species with a low fishing level, but it is the opposite for long-lived species with a high level of fishing. Therefore, it is necessary to study the relationship between the length of closing time of the *sasi* area and the economic value obtained by Raja Ampat fishermen.

The community's enthusiasm in supporting the implementation of *sasi* in Raja Ampat is based on their empirical experience that before the implementation of *sasi*, the fisherman's catches were shrinking and more difficult to obtain. This is because of the high level of fish resource utilization due to the rapid population growth, an increasingly open market access, as well as the increasing number of migrant fishermen who catch the fish themselves or buy fish from local fisherman (Johannes 1978). The results of the fisheries research in the Gulf of Kabui, Raja Ampat by Bailey *et al.* (2008) found that in 1999, the number of migrant fishermen was 20 people and it increased to 250 in 2006. Evans *et al.* (1999) stated that the decline of fisheries resources in several *sasi* locations in Moluccas was caused by the population growth and changes in fishing practices. The implementation of *sasi* in Raja Ampat has had a positive impact, seen through the decline in the number of both local and outsider fisherman who fish in no-take areas. This will assist the improvement of the coastal ecosystem in this area. Campbell *et al.* (2012) showed that the restriction in the use of fishing nets in the *panglima laot* indigenous-based management in Aceh successfully reduced habitat damage and maintained fish biomass.

Proceeds from the sale of trochus, based on data for 2 periods of *open sasi*, showed an increase in the sales value of the commodity as shown in Table 2. The income value received from the sale of trochus in the period of 2007–2009 was IDR4,854,000 and increased to IDR11,782,144 in the period of 2009–2012. The income received from the sales of the commodity is usually used for constructing public facilities such as the church, village streets, and the boat dock. Another benefit of the implementation of *sasi* is reducing the cost of management of the protected areas because the local people participate in monitoring and safeguarding their resources. In addition, the success of an area management will provide a bonus in the form of improved nutritional status and health of the local population due to the availability of fish resources (Aswani & Furusawa 2007). The marine conservation practitioners have agreed that community-based marine protected areas such as *sasi* can improve food security in coastal communities (Weiant & Aswani 2006).

Table 2 Weight, number, weight per individual, and the selling price of trochus during Kawe Regional MPA's *buka sasi* in 2009 and 2012

Year	Closing time (year)	Weight (kg)	Number (individual)	Weight (kg individual ⁻¹)	Price (IDR)
2009	2	243	626	0.39	4,854,000
2012	3	589	1,285	0.46	11,782,144

Sasi in the context of marine conservation in Raja Ampat

Efforts to adopt *sasi* into modern conservation management systems by conserving the marine resources in Raja Ampat started in 2003 through the customary declaration of Tomolol. In 2006, the indigenous people submitted their land to local government to be managed in a marine conservation system. Then in 2009 the local government and Regional House of Representatives issued Raja Ampat District Regulation Number 27 pertaining to the establishment of the regional network of marine protected areas in Raja Ampat region which covers 6 locations: (1) Ayau-Asia, (2) Kawe, (3) the Dampier Strait, (4) the Gulf of Mayalibit, (5) Islands Kofiau-Boo, (6) and South East Misool.

The adoption of the values of *sasi* in the effort to develop marine conservation in Raja Ampat has had a positive impact on the sustainability of fishery resources in Raja Ampat. These changes occurred because of the success of the NGOs working in Raja Ampat in disseminating conservation benefits for the sustainability of fishery resources to the community and local leaders in this area. An important effort has been done in this adaptation process: the renewal of the *sasi* culture for the management of marine resources. It can be seen in the adaptation of elements of modern conservation science into the implementation of *sasi* in the region. Identification results discovered during the study found that as many as 12 *sasi* elements have changed in terms of the implementation of marine protected areas in the study locations as shown in Table 3.

The changes in the implementation of *sasi* in Raja Ampat, if compared to before the establishment of the regional MPA in Raja Ampat, can be classified into 3 aspects

which are (1) the areas managed, (2) the institutions, and (3) the management system. The changes to the area aspects and marine resources that are managed in the context of conservation include the size of the area, *sasi* signs, boundary markers, targeted resources, and the size of the harvest. The changes in the institutional aspects include the increased number of stakeholders and the formation of a supervisory institution. In the aspect of the management system, *sasi* adapted these elements: purpose, length of time, legal basis, and form of sanctions.

Management of marine resources using a traditional system in general has several weaknesses, for example the limited area, the lack of boundaries, and the target resources are only certain species without any harvesting size limit. Through modern conservation approaches, a much larger area for the implementation of *sasi* in Raja Ampat is being considered. Prior to the establishment of protected areas, the average size of (temporal) *sasi* was less than 100 ha, and after the implementation of the conservation area, it exceeded 100 ha. Specifically for food security and tourism zones or permanent *sasi* zones, it covers an area of more than 100 ha. For example, the food security and tourism zone of Tapor Tamyam in Kampung Yenbuba covers an area of 2,500 ha. The increase in area of about 25 times will ensure all the biota within the *sasi* can thrive, especially species that have extensive cruising areas such as pelagic fish.

In general, the changes within *sasi* implemented in Raja Ampat Regional MPA also happened to the biota which is the target of *sasi* system's protection. Before the establishment of the regional MPA in Raja Ampat, there were 3 species of marine life with high economic value which were protected:

Table 3 *Sasi* changes in the context of the MPA establishment in Dampier Strait

<i>Sasi</i> elements	Before implementation of regional MPA	After implementation of regional MPA
1. Size of area	Small (< 100 ha)	Large (> 2,500 ha)
2. <i>Sasi</i> sign	Tree, coconut leaves	Information board
3. Border sign	None	Buoys and site coordinates
4. Target of resources	Sea cucumbers, trochus, lobsters	All marine biota
5. Harvesting size	Any size	Complies with science
6. Purpose of <i>sasi</i>	Collecting more money for building the church	Fish bank and tourism
7. Institution	The head of the village, the village representative body, traditional leaders, and church leaders.	The head of the village, traditional leaders, and church leaders and conservation management authorities
8. Supervision	Local people	Groups of rangers and local people
9. Enforcement of the rules	Customary sanction	Customary sanction and police
<i>Tutup sasi</i> duration	6–12 months	More than 2 years—permanently closed
<i>Buka sasi</i> duration	3 months	15 Days
Mechanisms of consensus	Consensus level of a village or several villages, usually without documentation	Consensus level of a village or several villages, documented by collective agreements by signing an official report and Board Agreement

sea cucumbers, trochus, and lobster. The number of species that were protected increased after it was declared as a conservation area. As in the regional MPA of Kawe, the kinds of organisms which are targeted in *sasi* protection in addition to the 3 types above are giant clams, turtle eggs, fish, and other marine and terrestrial biota. Moreover, modern *sasi* is equipped with a coordinate system and buoys that clearly mark the conservation areas. According to Dangebun *et al.* (2013), one of the causes of failure in the implementation of marine protected areas in Indonesia, especially in Southeast Aru Islands Maluku Province, is unclear area boundaries.

Institutional of Sasi in Raja Ampat has accommodate a limited basis elements from outside the village such as NGOs, tourism entrepreneurs, and universities. NGOs and universities provide advice in managing the of Sasi, while tourism entrepreneurs play a role in the utilization of the area for tourism. According to Berkes *et al.* 2001, the role of civil institutions such as NGOs have become part of fisheries management. Prior to the enactment of the management of marine protected areas in Raja Ampat, institutional of Sasi is very simple according to the social structure of the community. Sasi proposed and facilitated by community leaders that exist in the village, such as village government, traditional leaders and church leaders. Therefore, by involving civil institutions from outside the community in the management of of Sasi is one solution to maintain the continuity of of Sasi system in this area.

Sasi in Raja Ampat is not equipped with a resource-overseeing body, which functions: supervise, determine the timing of SASI and arrangements harvest size, as well as the utilization of sale proceeds. SASI management in Raja Ampat conducted jointly by all members of the village community. This differs to the *sasi* system in Maluku which is equipped with a supervisory agency called Kewang or "rangers" whose job is to supervise and manage *sasi* areas and the entire terrestrial and marine customary area (Wahyono *et al.* 2000; Tuhulele 2013). With the implementation of the conservation system in Raja Ampat, the *sasi* which is implemented in this area is now equipped with a community-based supervision system. The structure of the public monitoring group consists of one supervisor coordinator and as many as 4 members from the local community.

A fundamental change that has occurred to the *sasi* management system is the inclusion of this system into the Raja Ampat Regional Regulations. *Sasi* system implementation in Raja Ampat received legal power through the establishment of Raja Ampat District Regulation Number 27/2008. In this regulation, as stated in Chapter I, Article 15, it is declared that in the establishment and conservation management, elements of local wisdom need to be considered. Furthermore, in the draft of the 20 Year Park Management Plan of the Small Islands of Raja Ampat, it was suggested that it be divided into 2 zones associated with the *sasi*. The zones are: (1) the *sasi* and traditional utilization zone, and (2) the food security and tourism zone. The *sasi* and traditional utilization zone is a fishing zone allocated for people who still use traditional tools, with the aim to ensure the sustainability of the livelihoods of traditional fishermen. Whereas the food security and tourism zone is a no-take zone

that is reserved for fish and other marine biota breeding, aimed to function as food reserves for the community, and provide economic benefits through marine tourism activities (Mustaghfirin *et al.* 2012).

A formal establishment of *sasi* areas is very urgent because in the future, its existence will be eroded by the population growth and increased investment into the region. According to Caillaud *et al.* (2004), the continuity of traditional management in an area is strongly influenced by development, the influence of religion, education, and other cultures. Muehlig-Hofmann (2007) explains that the success of community-based conservation management is largely determined by strong local leaders. While according to Cinner *et al.* (2007), indigenous resource management institutions are not impervious to population growth and economic modernization; therefore, if the system is to be used as the basis of modern conservation initiatives, it is necessary to filter out the impact of socio-economic transformation.

The *sasi* system has also adopted modern conservation management concepts by increasing the closing time and shortening the opening time of *sasi*, and even applying permanent closure of some areas. The closing and opening system approach to conservation is one aspect of *sasi* management that aims to provide adequate time for the ecosystem to recover itself. The opening-closing system is similar to the temporary closure system in conservation management (Cinner & Aswani 2007). Prior to the establishment of the regional MPA, area closures lasted for 6–12 months while the area was opened for over 3 months. After the establishment of conservation in Raja Ampat, the closing time was more than 24 months but the opening time was less than 15 days. In the zoning system implemented in the Raja Ampat Regional MPA, there is a food security and tourism zone. The customary zone in Raja Ampat waters which has been declared as permanent *sasi* areas are areas which have these characteristics: they have a high diversity of coral species, and they are spawning and nursery grounds for fish. The customary community has permanently closed these areas. At the research location, there are as many as 4 permanent *sasi* which covers 20.77% of the 336,000 ha of Dampier Strait Regional MPA area.

The success in adopting traditional marine resource management to modern conservation has improved the condition of coral reefs in the Oceanic countries (Aswani *et al.* 2007). The difference between the concepts and practices of indigenous-based management and modern conservation can lead to the failure of the integration of the 2 systems, but if the difference is understood and respected, the hybrid system has great potential in achieving effective management because: (1) it is highly flexible; (2) it can conserve resources, and (3) it can achieve community goals (Cinner & Aswani 2007). Results of a study conducted by Cohen and Foale (2011) on the adaptation of customary fisheries management with modern marine conservation the countries in the Pacific region found that indigenous-based management that has adopted modern conservation elements has these characteristics: (1) it is similar to customary closing, (2) it can be managed by local management institutions, and (3) it is agreed upon as a management tool by the government, NGOs, and local communities.

Conclusion

Sasi in Raja Ampat is known as *kabus* or *samson* and is distinguished by these aspects: the location, the type of commodity, who performs the ceremony, the closing and opening times, the influence of the monsoons, and communal tenure. *Sasi*, which has been practiced from generation to generation, has a positive impact on the management of marine resources including maintaining the sustainability of fishery resources, recovering fishery stocks, reducing the exploitation rate, and increasing fishery revenue. The existence of *sasi* in Raja Ampat was adapted due to the establishment of the regional marine protected area in the following aspects: (1) the areas managed, (2) the management institution, and (3) the management system. The existence of *sasi* all this time has been able to protect the sustainability of aquatic resources due to the high compliance of the Raja Ampat local population to customary rules. In addition, they realize the potential and the benefits which the added values of marine resources could bring through marine tourism compared to capture fishery alone. The *sasi* management system will be able to survive (is resilient) in the face of social, economic, and cultural changes if the system adopts modern conservation elements such as changing temporal *sasi* to permanent *sasi*.

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