

AN INSTITUTIONAL ANALYSIS OF SASI LAUT, A FISHERIES MANAGEMENT SYSTEM IN INDONESIA

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Acknowledgement

I wish to acknowledge the co-authors of this study Irene Novaczek, Ansye Sopacua and Max Tatuhey, as well as our research partners from NGO Yayasan Hualopu and Pattimura University in Ambon. This research was funded by IDRC, the Danish aid agency DANIDA, ICLARM and The Netherlands Government.

ABSTRACT

In Maluku Province, Indonesia, natural resources are managed under a locally-defined set of rules and regulations known as *sasi*. *Sasi* has been in place for over 400 years. It is embedded in the local culture and based on customary law (*adat*). In theory, *sasi* rules that restricted access and limited harvest periods have the potential to provide long-term ecological as well as related economic benefits. While *sasi* - or remnants of it - are still being practiced on most islands, in parts of Maluku it is in the process of dying out. In 1997-98 a study was carried to assess the presence of *sasi*, the degree of activity, the reasons for loss or survival of *sasi*, market and management structures, and performance. Performance was expressed in terms of biological and social sustainability, efficiency and equity. The results of the study can be useful in the revitalization of traditional institutions or the establishment of new co-management institutions in the context of decentralization in Indonesia and elsewhere.

Introduction

The research was conducted in Central Maluku, Indonesia (Figure 1). Indonesia has a total coastline of approximately 81 000 km. With 200 million people to feed, marine resources are of tremendous importance. However, like most countries that own valuable marine resources, the ecosystem is affected by coral reef destruction and overfishing, thereby in the long run, threatening the livelihood of coastal inhabitants. Maluku is no exception where it comes to prolonged destruction of the coastal habitat. What makes the region so special though, is that while marine resources are being destroyed at one place, there are still several regulations in place that implicitly protect the resources in specified areas (Zerner 1994a). This system is generally known as *sasi*. *Sasi* is still being practiced in Ambon, Seram, and the Lease Islands of Haruku, Saparua and Nusa Laut.

Sasi

Sasi can be defined as a broad set of rules and regulations that govern resource use. *Sasi* regulations prohibit the premature harvesting of forest and marine products, but are also applied on social behavior (Kissya 1994; Zerner 1994b; Benda-Beckmann et al. 1995; Nikijuluw 1995; Mantjoro 1996). With regard to marine resources or *sasi laut* (*laut* = sea) there are regulations on the use of poisonous plants and other chemicals, destructive nets and gear such as the *bagan* (lift net). There are also regulations on access to the *sasi*-governed areas, activities that are permitted, and seasonal rules of entry and harvest.

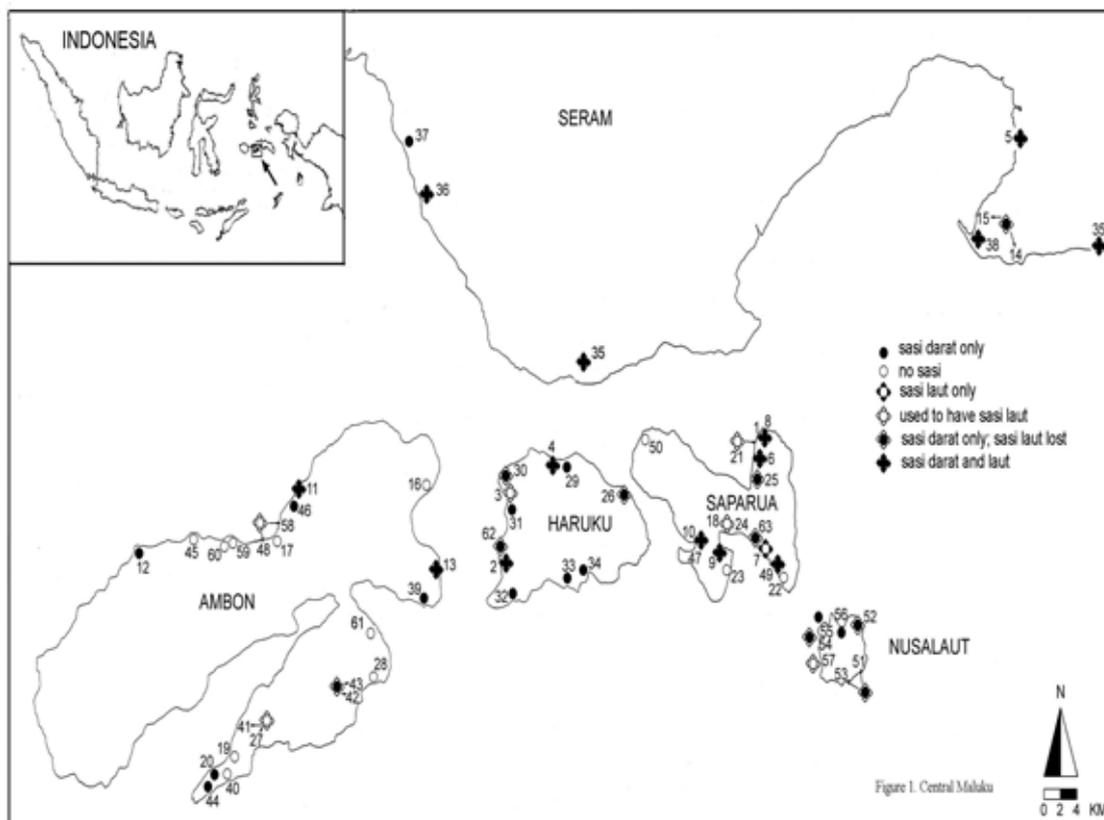


Fig. 1. Central Maluku, Indonesia

All these rules are in turn guarded and enforced by an institution known as the *kewang*, which functions as a local police force (Kissya 1995). Their legitimacy, as well as that of the *sasi* institution itself, is based on *adat*. *Adat* stands for customary law and tradition (KITLV 1925). *Sasi*, as an integral part of the *adat*, is an intrinsic part of Moluccan society. Nevertheless, throughout the ages, the *sasi* system has been threatened and changed under influence of trade (spice wars), colonization (Portuguese, English, Dutch), religion (Christianity and Islam), and the imposition of nationally-defined government structures in the 1970s. Current threats to the system are modernization and commercialization which cause a general erosion of traditional values. These aspects are more elaborately dealt with in the discussion on institutional resilience in the research report (Novaczek et al. 2001a).

Research Components and Approach

The study was based on existing studies (Ruhunlela 1993) and the research framework of the Fisheries Co-management using institutional analysis (ICLARM-NSC 1996). The study comprised four components:

1. An inventory of 63 *sasi* villages in Ambon, south Seram, and the Lease islands;
2. A performance study of 11 strong and 11 weak *sasi* villages;
3. Case studies of 6 villages: 2 where *sasi* was strong, 2 where it had disappeared, and 2 where *sasi* was lost, but was being revitalized; and
4. A market study and study of government-management structures.

1. In order to determine how many villages actually have a working *sasi* system and how many have not, the study aimed to cover all the villages in Ambon and the Lease Islands. In total 63 villages were inventoried. Complete coverage was achieved in the Lease islands, while on Ambon we left out the suburbs of Ambon city. Included also were a few villages located in south Seram where *sasi* was being practiced as well.

In every village 3 village officials were interviewed using a standard survey to determine the strength of *sasi* by indicating the presence and extent of *sasi* activity. Map 1 shows which villages had *sasi* in 1998 and which had lost it, distinguishing *sasi* on land and marine resources.

2. From the inventory 11 villages with strong *sasi* were selected and 11 with no *sasi* in order to demonstrate its performance in terms of equity, efficiency and social and biological sustainability (Table 1). In reality most villages have some kind of *sasi* or at least some remnants of it. The values for each indicator are based on the perceptions of fishers using a self-anchored ladder scale (Pomeroy et al. 1996). Additionally, biological surveys were carried out to assess the impact of *sasi* on the resources.

Table 1. Performance indicators of *sasi* study

Equity	1.	Role of fishers in management	⇒	The degree of influence that fishers have in decision-making processes regarding fisheries management
	2.	Access to marine resources	⇒	The individual access that fishers have to marine resources
	3.	Fair distribution of fishing gear	⇒	The division of (expensive) fishing gear among the fishers in the villages
	4.	Economic equality	⇒	The distribution of income (disparities) among the villagers
Efficiency	5.	Communal decisionmaking	⇒	The degree to which villagers are able to make decisions (on the fishery) communally
	6.	Ease of entry into the fishery	⇒	The costs and/or fees that need to be paid before people can start fishing
	7.	Control over access to fishery	⇒	The ability of people to define who is entering the water and which resources are used
	8.	Compliance with fishery rules	⇒	The degree to which people stick to the fisheries rules
Social Sustainability	9.	Family wellbeing	⇒	Degree of wellbeing in terms of housing, food, and health
	10.	Income	⇒	The rise or decline in income
	11.	Tradition of collective action	⇒	The occurrence of communal activities in the village (e.g., construction of roads and houses)
	12.	Discussion of village issues	⇒	The degree to which village issues are openly discussed in the village
	13.	Community harmony	⇒	The lack or occurrence of conflicts in the village
Biological Sustainability	14.	Marine-resource health	⇒	The state of the resource in terms of coral health, numbers of fish, water clarity, etc.
	15.	Fish catch	⇒	The amount and size of fish caught

3. Nolloth and Haruku were both celebrated and widely-known examples of the *sasi* system. These two strong *sasi* villages were compared with two villages where *sasi* was lost (Tuhaha and Hulaliu) to understand the process of decline. Both these villages appeared to be in the process to revitalize the *sasi* system at the time of this study. This made the cases even more interesting to study institutional resilience, i.e., what makes an institution strong and what makes it collapse. Yet, in order to make a

real comparison between *sasi* and non-*sasi* villages, the study was extended to two villages on Ambon Island with no *sasi* at all (Seri and Hutumuri).

In each village a comparative institutional analysis was carried out. Data were gathered on contextual variables, structure and function of institutional arrangements and management outcomes. Semi-structured interviews were used to understand the patterns of interaction and why institutional changes occur. A 6-person team carried out 176 surveys while another 157 persons were interviewed, among whom were 45 women (Table 2).

4. Apart from the standard interview, it was deemed important to map out the market structures. For this purpose, another 42 people were interviewed comprising pole-and-line fishers, bait fishers, small-scale fishers, retailers, traders and representatives from the fishers' cooperatives. Another 16 women, the main local retailers, were interviewed (Table 2).

Furthermore, a team from Yayasan Hualopu interviewed government representatives on the provincial, district and subdistrict levels. They talked to representatives from the Ministry of Planning, the Ministry of Forestry and the Ministry of Transport as Indonesia, despite its vast marine territory and length of coastline, had no Ministry of Fishery at the time of writing. Additionally, the team interviewed naval and police personnel to determine the responsibilities of both institutions in enforcement. The results of the study on the management structures are published in Marine Policy (Novaczek et al. 2001b).

Table 2. Research components of institutional analysis of *sasi* and numbers of respondents

Project objective and research component	Methods	Geographic area	Type of Informant	Number
1. Inventory of <i>sasi</i> institution in central Maluku	Structured interviews	63 villages on Nusa Laut, Saparua, Haruku, Ambon and Seram Islands	Village official <i>Adat</i> leader Church minister Fisher, elder Teacher, researcher Total	83 24 6 48 2 165 (7 women)
2a. Performance analysis of <i>sasi</i> at the district level	Structured interviews & ladder survey	22 villages on Saparua, Haruku, Ambon, and Seram	Fishers Total	332 332 (73 women)
2b. Performance analysis of <i>sasi</i> : biological aspects	Biological survey (direct survey, informal interviews)	Saparua (Nolloth, Itawaka, Ihamahu), Haruku (Haruku) and Ambon (Toisapu, Hutumuri, Seri, Airlow)	Village officials Fishers <i>Adat</i> leaders Women Total	5 2 1 1 9 (1 woman)
3a. Institutional analysis 6 villages: contextual variables and outcomes	Structured interviews & ladder survey	Nolloth, Haruku, Tuhaha, Hulaliu, Seri, Hutumuri-Toisapu	Fishers Total	176 176 (8 women)
3b. Institutional analysis: Resilience of local institutions	Semi-structured interviews	Nolloth, Haruku, Tuhaha, Hulaliu, Seri, Hutumuri-Toisapu	Village officials <i>Adat</i> leaders KUD staff Elders Youth Fish traders Women's leaders Male fishers Female other Male other Total	25 7 7 21 18 22 14 10 9 23 157 (45 women)
4a. Fisheries and market study	Structured and semi-structured interviews	Major and minor fish landing areas and markets on Ambon Seram, Saparua, Haruku	Pole & line fishery Bait fishery Small-scale fishers Fish retailers Fish traders Fish factory staff KUD managers Total	1 9 9 16 4 2 1 42 (16 women)

Project objective and research component	Methods	Geographic area	Type of Informant	Number
4b. Government management structure at provincial, district and subdistrict levels	semi-structured interviews	Ambon city (provincial capital), Masohi (District capital), Saparua island, Haruku island (subdistrict offices)	Bappeda (Planning)	4
			Dept. of Forestry	2
			Dept. of Fisheries	
			Provincial	1
			(Sub-) District	8
			Dept. Transport	4
			Law bureau	1
			Environment bureau	1
			Police	3
			Navy	2
	Total	26 (0 women)		
			Total number of interviews	907 (150 women)

The full (updated) details of the study are presented in the ICLARM technical report entitled “An Institutional Analysis of Sasi Laut in Maluku, Indonesia” (Novaczek et al. 2001a).

Results

Patterns of interaction. *Adat* defines the *sasi* institution and lays down the basic ethics and codes of conduct. Respect for ancestors, positions of traditional village leaders and the use of ceremonies are all important components of the *sasi* system. The constitutional rules in the *sasi* system stem directly from *adat* and are rather complex with a philosophical basis (see for types of rules Ostrom 1990).

The collective-choice rules define how players in a *sasi* system work together, for example, the selection of *kewang* members and adaptation of operational rules. Access and withdrawal rights are also defined under these rules. The day-to-day activities in the *sasi* system, such as timing of the harvest, limitations on gear use and decisions on marine products to be harvested, are part of the operational rules. To a certain extent these rules coincide with formal legislation, such as the rule on blast fishing and use of cyanide.

People with a decision-making role are the traditional *adat* leaders, the village head (*kepala desa*), the *kewang* head and, to a lesser extent, the religious leaders. In many cases, the personality and legitimacy of the village head is determining for the success of a *sasi* system. *Adat* positions are inherited through family lineages. The connection of the village head with the traditional royal lines (*raja*), his collaboration with *adat* leaders and support during elections are crucial for his legitimacy. He plays a key role in the decision-making process. The *kewang* who are essentially a kind of traditional police enforce both the rules and prosecution of offenders. Even though the *kewang* have no legal power, their traditional legitimacy is perceived to be high.

Incentives to cooperate and comply. Compliance is a key factor in fisheries management. Many villagers were not aware of formal fisheries regulations which clearly illustrates the importance of *sasi* regulations in such regions. Incentives to comply are fear of the *kewang* and, to a far lesser extent, the police. Interestingly none of the 176 respondents from the villages witnessed the presence of patrol boats to enforce the formal fisheries regulations. Fear of divine retributions, judgments by ancestral spirits and excommunication from society are also powerful incentives to comply. The fact that *sasi* is based on *adat* and thus part of the local culture is important: “*Sasi* has a spirit and everyone carries it.” Legitimacy, flexibility, clarity of objectives, and benefits of an economic, social and environmental nature are all incentives and can be grouped under what was stated by most respondents, i.e., that “*sasi* is good.”

Outcomes. Equity in terms of access to resources regulated under *sasi* is not a major issue for family food security or income because *sasi* covers only a few species and relatively small areas. Most income is derived from the deepwater pelagic fishery freely. The sale or auction of harvest rights to people outside the village is perceived as unfair and equal division of the catch (like the communal harvest of the *lompa* fish in Haruku) is preferred. However, control over resource management and compliance to

fisheries' rules is higher in *sasi* villages as opposed to non-*sasi* villages. Also the communal decision-making process is also perceived to be stronger and more stable.

Sasi is fundamentally male-dominated and women are excluded from the decision-making process. On the other hand, the hierarchical structure and low level of bureaucracy make it perhaps not very democratic, but certainly efficient. Although *sasi* is hierarchically-organized, the general community largely refrains from questioning these arrangements because the structures are largely in line with traditional laws and perceived as benefiting all.

Sasi has a significant positive impact on social sustainability. *Sasi* villages have higher levels of interaction on community issues, a stronger tradition of collective action, and significantly fewer conflicts. There is no demonstrable economic benefit from *sasi*, but conversely, *sasi* does not bring economic disadvantages.

Sasi rules that restricted access and limited harvest times clearly have the potential to provide economic and biological benefits. Biological surveys suggest limited biological benefits to certain protected species. Top shell (*Trochus niloticus*), currently on Indonesia's endangered species list, would easily have been extinct in Maluku if not for *sasi*. Also the presence of sea cucumber is more common in *sasi* areas. The effects of *sasi* on coral reefs are not clear, but biological surveys do suggest that reefs are protected from blast fishing whenever the area is guarded. The possible impact of *sasi* on the broader (pelagic) fisheries resources is also unclear, but it is very well possible that these inshore areas happen to be critical spawning or nursery habitats for pelagic resources.

Conclusions

In Maluku province, coastal villages claim *de facto* rights over the marine territory based on *adat* (KITLV 1925). Access and withdrawal rights are usually restricted to – and shared among community members. In other words, the resources are regarded as common property goods. In the study area there is an overall decline in compliance to fisheries rules, fish catches and environmental health. Fishers in small canoes are surprisingly able to cover large distances and fish even side-by-side with industrial fishers. The *sasi* institution is in decline and in many villages has disappeared. Yet, the need for effective conservation and management is more urgent than ever and an important question is in what ways *sasi* can be a suitable model or basis for future fisheries management.

The existence of *sasi* means that certain important management concepts are widely known and valued as part of local culture that are important in any marine resource management and conservation regime. These include:

- The concepts of community-tenure rights over a marine area, of open and closed areas and seasons, and of limiting access to resources;
- Locally-developed and agreed-upon regulations. These may be specific to the village (limitation of gear types, size of fish or shellfish harvestable) or may reinforce national laws (prohibition of blast fishing, use of poison);
- Local wardens or enforcers (the *kewang*) who have defined rules of process as well as prescribed sanctions to impose;
- An overall goal of improving or maintaining community welfare which, being rooted in *adat* or the concept of the unity of man with nature, is consistent with modern concepts of sustainable use;
- A hierarchical institutional structure wherein various tasks are divided among clearly-defined bodies (i.e., the village government, the *kewang*, or the church);
- Low or no financial cost to formal government, i.e., *kewang* members and church leaders involved are not paid wages, although they may receive a share of harvests. Local government offices may also receive income from the sale of harvesting rights for communal resources; and
- Resiliency and the ability to evolve.

Sasi has an efficient and legitimate base through *adat* on which to build the structures required for efficient co-management arrangements. The *sasi* institution has already proven to have demonstrable social and environmental benefits. Yet, it has also certain weaknesses that should be taken into account when setting up new management structures:

1. The limited scope of *sasi* on only a few species and specific local inshore waters, as opposed to a wider range of resources, for example pelagic species;
2. *Sasi* has a strong hierarchical structure and is highly dependent on the village head;
3. The drawbacks of flexibility that opens the door to manipulation for ends that neither conserve nor manage the resources;
4. Lack of financial resources which limit the effectiveness of the system, for example, enforcement required by the *kewang*;
5. Limited access to new information and alternative technologies due to the fact that existing communication channels are either weak or nonexistent; and
6. The influence of urbanization, population growth and modernization which can cause marine *sasi* practices to erode.

The declining fish catches throughout the study area, however, signal the failure of higher levels of fisheries management. The lack of a responsible ministry and unclear management authorities of government institutions makes policy development a complicated issue to be dealt with.

In the process of decentralization and moving towards co-management of natural resources, it is important to analyze the centralized character of the Indonesian society. In Indonesia, the community and village organizations are controlled through existing government structures. Also within the villages, the strong hierarchical structures discourage input from the overall population. The village leader has a powerful role and fisheries management depends a great deal on his motivation and proactiveness. There is a strong segregation within the villages between economic classes and between men and women. In this light, it is a challenge to integrate the principles of decentralization (equity and participation) in local village structures and to achieve functional collaboration between the village and the various government levels.

Legal researchers have pointed out that under various national laws, the village head has the responsibility to ensure that local resources are managed to provide optimal benefits for the local community. Also according to the current structures the village head plays a key role. To avoid the risk of collapsing management structures or political instability as the result of reelections, a viable option would be to base the management institution on more stable traditional institutions such as *adat* or the church. Existing or revitalized traditional institutions such the *latupati*, an island-wide congregation of village leaders, could also form an important basis for resource management and a tool to exchange information.

Sasi combines the authority of the village head with the legitimacy and ethics of *adat*, and therefore seems to be the logical institution for management of inshore waters. This importance is however not acknowledged through explicit legal rights of tenure or management. Once provided with a defined legal mandate, villages could formally delegate management duties to a local *sasi* institution or *kewang*. The involvement of local institutions in monitoring and enforcement, and as partners in development planning, would lead to a more conducive situation in which inshore waters would be managed under a system of co-management.

Powerful externalities affect fishers and resources over time, including new world market demands for marine resources, collapsing clove prices, monetary and political instability, and climate change. The turbulent cultural and social history of Maluku and the impact of national development policy further contribute to complexity. Because *sasi* has no legal basis, it remains highly vulnerable to these externalities. Nevertheless, as a result of its relatively high institutional resilience, the *sasi* institution has so far been able to withstand the pressures.

In conclusion, *sasi* offers a solid foundation for resource management in the region (see also Hualopu 1996). It provides a structure that is culturally embedded, a functional enforcement mechanism, and a set of rules and regulations that are acceptable to most. The familiarity with management concepts, the

acknowledgement of a need to protect natural resources, perceived benefits and general appreciation of *sasi* makes it highly legitimate. With a formally acknowledged *kewang* who have access to funds, training and a network, enforcement of regulations can be carried out locally in a legitimate way. With the assistance of NGOs, scientists and government, (co-) management structures could be established that include the principles and components of *sasi*.

Epilogue

Recent political developments on the Lease Islands and Ambon have not only affected *sasi*, but undermined the total social structure of the islands as well. Because of unclear reasons since January 1998, Maluku has been the scene of violence between Christian and Islamic people. The battle, which is speculated to have been instigated by outsiders, has been largely attributed to religion and divided Ambon Island into separate Christian and Islamic areas. Entire villages are burned down and refugee camps house ten of thousands of people. The social disintegration has been severe and at the time of writing, the researchers can only hope that the violence will cease and a permanent solution agreeable to all parties be negotiated and accepted. The extent in which the violence affected local structures such as the *adat* and *sasi* can however only be left to speculation at the time of writing.

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