

## **Marine Resource Management in Central Maluku, Indonesia**

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Between June 1997 and September 1998 collaborative research on fisheries management in Central Maluku, Indonesia, was carried out by Hualopu Foundation, Pattimura University and the International Center for Living Aquatic Resources Management (ICLARM) (Manila).<sup>1</sup> The focus of the research was the inventory and institutional analysis of the traditional management system called *sasi*, but studies of formal government management as well as of the fish harvesting and marketing systems were also carried out. The result is a lengthy report (Novaczek & Harkes 1999) which can be obtained from ICLARM by those wishing to see the detailed data that back up the findings. What we present below is the executive summary of the research.

### **1 The Maluku fisheries**

The marine resources of central Maluku are very rich but are under severe pressure, particularly from destructive fishing techniques. After a period of rapid increase in fishing pressure and catches, there is now clear evidence of overfishing of several important commercial stocks (shrimp, skipjack, small pelagics) and therefore a need for more cautious management. Nevertheless, economic pressures provide a strong incentive for further expansion of fisheries.

The fishery is numerically dominated by artisanal fisher-farmers having low-technology boats and fishing gear and limited formal education. It is the artisanal and small-scale sectors of several islands of central Maluku (Haruku, Ambon, Saparua, Nusalaut and Seram) which are the topic of this research. When a sample of 508 fishers was divided into age classes (<45, 45-60, >60) it was noted that the younger fishers include a

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relatively greater proportion of Muslims than are apparent in older generations of fishers. Younger fishers are also more focused on deep water pelagic resources. Fishers are also moving from the artisanal to the small scale sector and onto larger commercial vessels as crew.

Both artisanal fishers and commercial crew earn marginal incomes, have no say over fish prices, and are unorganized. Profit sharing systems that are in place provide incentives to fishers to maximize catch, if necessary through use of destructive gear such as very fine mesh nets. At the same time, enforcement of national fisheries regulations is lax and there are serious deficiencies in government management agencies in terms of motivation, coordination, knowledge, infrastructure and funding support. Local village institutions which sometimes manage fisheries (*sasi*), are well respected by the majority of fishers, whether they live in a village which has the institution or not, but have less credence with the younger, commercially oriented fishers.

The majority of rural, coastal villagers are still directly or indirectly dependent on the fishery. They clearly recognize that inshore and pelagic fisheries resources in Maluku are in decline. Ninety six percent of 508 fishers surveyed reported declining catches, with an average decline of over 30% in the past 15 years. Fewer than 10% encourage their children to enter the fishery even though they themselves find it to be a fulfilling occupation. Fishers also report an overall decline in social interaction and cooperation and compliance to fisheries rules. Collapsing inshore fish catches have driven subsistence fishers ever farther out to sea and future conflict with commercial sectors is inevitable if management and conflict resolution arrangements are not set in place. In particular, fishers see the explosion in the numbers of large fishing vessels, fish aggregating devices and floating lift nets, as well as more efficient modern gear, as the root of their fisheries' problems. They also are quick to point to degradation in the marine environment such as damage from blast and poison fishing and water pollution, as factors. However, fishers in general do not perceive that management options are available to redress the situation. They also still consider ocean resources to be unlimited, even though local resources may be depleted. They see the solution to declining catches as being an increase in their fishing power (bigger boats and motors). In other words, if you can't beat 'em, join 'em!

NGO and academic researchers, noting these trends, have begun to push government to look for ways to revive or establish local management, with *sasi*, a traditional resource management institution, as the basis. We explore relationships between the *sasi* institution and contextual factors of central Maluku to see whether *sasi* is a useful model or basis for future local management. Because case studies were carried out only in Christian villages, the findings below are not necessarily true for Muslim villages.

## 2 Societal context of fisheries management

Social and political structures in the Christian villages of central Maluku reflect the centralized and hierarchical national structures. Decision-making processes involving higher government levels are not open for local input, nor are local decision-making processes participatory. The leaders have little confidence in the abilities of common villagers. Environmental groups, which are outside of the government and church hierarchies, are rare. Indonesian citizens are trained to identify with the state rather than with local groups. Although similar types of organizational structures (church, government and *adat* [traditional] institutions and organizations) are found in most of the villages, there are differences in terms of the relative role of *adat* leaders in village society and government. Villages in the study area range from relatively isolated, highly traditional rural communities where *adat* leadership is paramount, to more modern urban satellite villages where *adat* leaders lack significant influence. *Kewang*, an *adat* enforcement organization, plays a central role in village resource management in the more traditional villages with an active *sasi* institution. *sasi* is a system under which particular areas, crops or resources on land or in the sea may be put under harvest prohibition for limited periods. *Kewang* members, selected under rules that vary from place to place, act as unofficial police, guarding those crops and marine resources which are under *sasi*.

The spread and functionality of village organizations, whether church, government or *adat*, is dependent on 1) provision of economic benefits, 2) broad support by the villagers, 3) stable leadership and 4) the ability to stay at arms length from village politics. Church organizations are most

stable but as their spiritual aim is more important than economic benefits, membership is limited. Government groups are often dominated by upper classes and are most vulnerable to political instability, for instance when a village chief is elected with a slim majority and faces a strong opposition. *adat* organizations may either be supported by church and government powers, as in Nolloth on Saparua Island, or there may be a power struggle among the authorities which leads to the disappearance or weakening of *adat*, as reported in a number of the 63 villages documented. If village leadership is not perceived to be legitimate, village organizations that are typically headed by the village leader or his wife, become dormant or dysfunctional. Thus, functionality of government and *adat* groups is highly dependent on the presence of a culturally legitimate and strong village leader. Because village government leaders are used to taking orders from above rather than initiating action, future local management institutions must be supported by higher government levels. Village leaders will need assistance and incentives to be proactive and creative in developing new management arrangements. The institution must be meaningful to ordinary villagers, provide economic benefits (preferably direct), and for stability should be linked to the *tiga tungku* (three hearthstones, ie, church, state and *adat* ) but at the same time buffered from direct impacts of political strife and changing village leadership.

### **3 Local management institutions**

Coastal villages typically claim de facto rights of access and withdrawal over fairly extensive areas of both land and sea. *Sasi*, the local institution under which some fishing activities are regulated, is nested in traditional culture, called *adat*, which lays down the basic ethics and codes of conduct. In other words, the constitutional rules of *sasi* are part of *adat*. As an institution, *sasi* has never been static but has changed with the times. *sasi* and the underlying *adat* culture have waxed and waned, absorbing and reflecting the impacts of colonialism, war, economic development and social change. Despite past predictions of imminent demise, both *sasi* and *adat* persist and in 1997, *sasi* is still widely supported and believed to be a good thing, even in villages where the institution no longer functions. The spiritual aspects of *sasi*, its cultural legitimacy, ceremonies, and

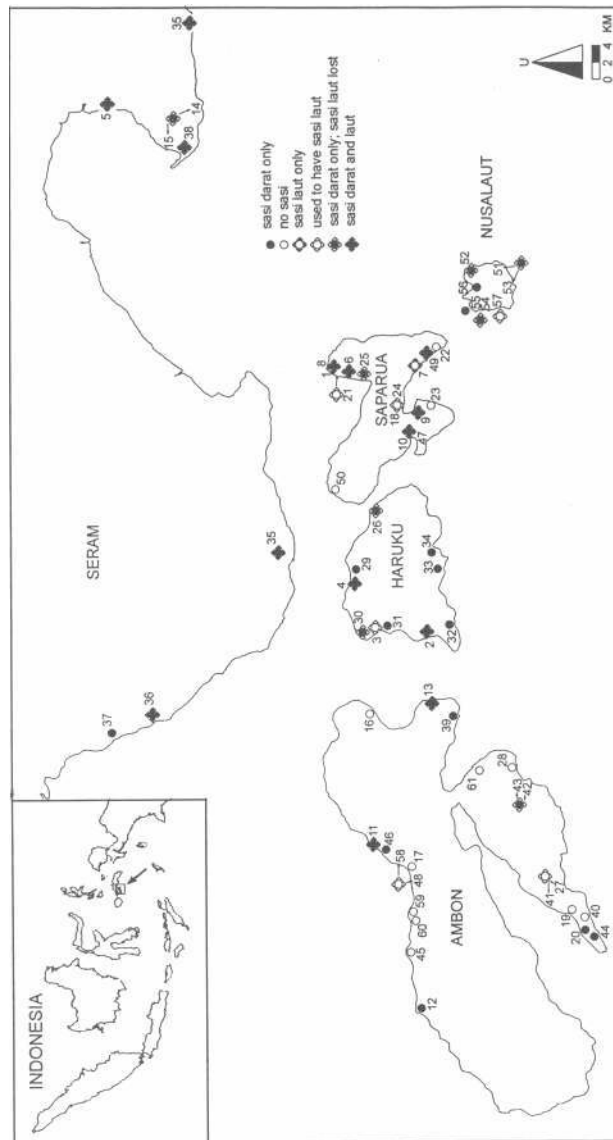
the relationship to indigenous tenure rights all encourage support by the community. Modern village leaders are often attracted to *sasi* as a culturally acceptable basis for collection of resource rents to support local government.

The majority of the 63 central Maluku villages documented (these include every village on the islands of Haruku, Saparua and Nusalaut, half of the rural coastal villages of Ambon island and a small number on Seram) still retain some form of local *sasi* institution but only a quarter have rules pertaining to marine management. *sasi* practices vary from village to village. In the case of marine resource management (marine *sasi*) a village may or may not have, for example, rules restricting gear types, access restrictions for specific areas, restrictions on the size of shellfish to be harvested, prohibitions on destruction of coral or mangroves. The governing and enforcing authorities may be *adat*, church, local government and/or private individuals holding harvest rights. The character and legitimacy of the village chief (*kepala desa*) is the key to successful function of the institution because he holds ultimate decision-making authority.

There is often, but not always, a *kewang* to patrol *sasi* areas, and catch and prosecute rule breakers. In villages where *sasi* has evolved into an almost purely commercial transaction, the *kewang* are no longer traditional leaders. Collective choice rules, a mixture of tradition and modern innovation, define how the players in *sasi* work together. The operational rules of marine *sasi* regulate day-to-day activities in the marine territory and/or *sasi* area. These operational rules may be indigenous or may mimic national legislation, and are subject to revision. This adaptivity is important to the resilience of the institution but has also led to the development of a patchwork of marine management efforts lacking a unified purpose and also lacking a set of minimum standards.

Marine *sasi* is most prevalent in mid-sized villages distant from the urban centre of Ambon. In no case is management under *sasi* comprehensive; only small areas of shallow water and few species (most often *Trochus*, sea cucumbers and small pelagics; less often corals, mangroves and various small shellfish) are regulated. Nevertheless, the existence of *sasi* means that certain important management concepts are widely known and valued as part of local culture. Using *sasi* as the basis for development of a modern management institution can therefore be con-

Figure 1: Fishing Villages and Sasi



sidered to be efficient as it reduces potential costs of public education and enforcement.

Government staff generally agree that local institutions are useful and hold a strategic position close to the resource and to fishers. Also, younger fishers especially tend to see the community as having responsibility for management. However, *sasi* and *kewang* lack formal legal status and they are effectively isolated from regional, provincial and national management structures. The *kewang* as a group have no role in the process of planning for fisheries development nor in the process of developing provincial fisheries policy and regulations.

Stakeholders are motivated to comply or cooperate with the *sasi* institution according to the incentives and options inherent in their situation. The outcome of the interaction between the management institution and resource users was assessed in terms of social and biological sustainability, and the efficiency and equitability of management.

Equity in terms of access to resources is not a major issue because *sasi* covers few species and small areas. *sasi* also has no effect on distribution of fishing gears or on economic disparities. However, fishers are not neutral about equity issues in cases where harvest rights are sold or auctioned. If benefits are not seen to be fairly distributed or if they accrue to outsiders this can lead to non-compliance but where the decision-makers are respected and use the proceeds for community development, this arrangement can be very efficient and also reasonably equitable. Where marine resources under *sasi* are harvested as a communal crop and distributed equitably among the population, fishers do not complain.

Fishers perceive control over resource management to be tighter in *sasi* villages, and compliance to fisheries rules is greater. Communal decision making process is also stronger and more stable. Although decisions are said to be made "by the community", the voices of fishers may or may not be heeded, and women are excluded. *sasi* is therefore not equitable in this sense. Common fishers in *sasi* villages feel no more involved in decision-making than fishers in non-*sasi* villages. However, the hierarchical structure is very efficient and culturally acceptable as long as leadership is strong and legitimate.

*Sasi* has no impact on the economic status of individual artisanal fishers, probably because the resources managed under *sasi* constitute a rela-

tively small proportion of family income. The major difference between *sasi* and non-*sasi* villages is in terms of social sustainability. Generally there are fewer trends of deterioration through time in *sasi* villages. Fishers in *sasi* villages felt that there was a strong tradition of collective action, greater discussion of village issues and greater harmony. Social sustainability, especially family well-being and income, is positively influenced by whether fishers are members of village organisations and satisfied with their jobs.

There was no evidence that *sasi* had any impact on the health of the fishery in general, doubtless because *sasi* pertains only to small, inshore areas and most fish are caught in the deep sea. Both *sasi* and non-*sasi* villages suffer from blast fishing. *sasi* areas are also vulnerable to damage caused by external forces such as mining exploration. At a local level, guarded *sasi* areas suffer less damage than adjacent unguarded areas. On a regional level, however, coral reef condition is more closely related to population density and fishing pressure than to presence or absence of the *sasi* institution. More research into the condition of a larger number of guarded *sasi* areas would be useful.

*Sasi* has demonstrable benefits in protecting the shellfish *Trochus niloticus* (*lola*) and sea cucumbers (*teripang*). Although there was suitable habitat and a history of exploitation in non-*sasi* villages, *teripang* and *lola* were extremely rare. This suggests that *lola* and *teripang* may now be largely confined to *sasi* areas which are subject to harvest restrictions and guarded.

Socio-economic variables correlated with the performance indicators for *sasi* included the style of village decision-making, job satisfaction, belief in the importance of *sasi*; attitudes towards changing and bending rules and selling harvest rights, the type of gear owned, external income and economic score, and whether fishers are part of village groups and/or are involved in communal fishing (see Table 1). Interestingly, resource health was not directly related to the desire to change rules. Fishers with more expensive gears feel they have more say in decision-making.

Surveys reveal that fishers in general find it important that all stakeholders are represented in decision-making. Fishers who feel that village decision-making is based on consensus or majority agreement have more positive scores on all performance indicators. For a management system it is thus important that the decision-making process is perceived



Table 1.1: Performance indicators

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

to be inclusive. Insulation of the management institution from village politics is also important. Where formal and traditional leaders collaborate closely, and where leadership is highly legitimate, *sasi* thrives. What makes the *sasi* institution strong (and thus resilient) is that which links the various players and components ie, legitimacy, trust, collaboration, transparency, etc. A shared notion of the relevance of the institution is also needed to stimulate a common objective to maintain *sasi* in spite of external influences.

*Sasi* provides a valuable example in that it has proven that rules pertaining to gear types, access, closed areas and seasons, etc. can be successfully developed and applied at the local level by villagers who have relatively low levels of formal education as well as only a hazy concept of resource management per se. In the absence of a science-based rationale for management, an ethic of working together for the benefit of the community, attachment to a cultural tradition and the tendency to comply with sanctions based in religious beliefs have in this case combined to form the basis of a resilient and, within its narrow scope of application, demonstrably effective institution. Whether this degree of success can be replicated at a larger scale, or in the context of more modern, culturally heterogeneous communities, has yet to be seen.

*Sasi* also provides an alternative to the western idea that local management must be highly democratic and inclusive. The paternalistic model is potentially very efficient and cost-effective, putting little demand on the time of busy fishers, farmers and women, and is also, at least for now, culturally acceptable. What is important is not to further entrench current elites by allowing the system to become inflexible and non-transparent. Should democratic ideals and gender equality one day become the norm, the management institution must be able to evolve to accommodate increased need for participation.

Various contextual realities are at work around the revitalization of *sasi* as a management institution. The national ethic of non-questioning obedience to central authority prompts village leaders to do nothing but the potential to collect resource rents through *sasi* makes reviving the institution very attractive. For fishers themselves the incentives are more linked to culture than to a consciousness of the need for management. Strong market demand coupled with high dependence on the fishery make vil-

lagers wary of management that might restrict access or impose catch limits. On the other hand, competition among sectors may push artisanal fishers to organize themselves and demand clear access and withdrawal rights on pelagic fishing grounds.

The perpetuation of *sasi* (as opposed to introduction of a totally new institution), especially if it includes religious leaders, would be an asset in that compliance would be encouraged. With a local institution involving respected traditional and religious leaders, resource users would feel secure. However, loss of interest of younger generations and the subsequent loss of *sasi* knowledge linked to *adat* is a threat to *sasi* as a cultural institution and could therefore undermine its effectiveness as a resource management structure. It is important to ascertain the importance of traditional language and ritual, and how much needs to be incorporated into a revitalized institution.

Modern village institutions should provide a transparent, inclusive decision-making process, mechanisms to change rules, mechanisms to enforce rules, direct benefits for the fisher-managers, a funding base (part of which could be generated by village organizations), and a stable management structure that includes, but is not dependent upon, the village government. The needs and aspirations of the various proponents (fishers, local governments, fisheries managers, *adat* leaders, environmentalists) must be successfully accommodated. Local institutions need to be involved not only in local monitoring and enforcement but also as partners in development planning and implementation, stock assessment and allocation, licensing etc. In addition, to have a place in negotiating access and withdrawal rights for artisanal fishers in offshore waters, local institutions will need to engage or be nested in a larger institution operating on regional, provincial and higher levels. Presently, there is no identifiable lead agency dedicated to coastal and fisheries management in Maluku.

Factors which contribute positively to the resilience of *sasi* as a local institution should be considered during the process of modernizing local management. For instance, the legitimacy of a village chief who descends from the raja line contributes positively to the execution of his authority with regard to *sasi*. A large overlap between the traditional and formal authorities in the village government is also beneficial, and acknowledgement of the traditional village authorities within formal gov-

ernment is vital to revitalization of *sasi*. Where traditional institutions are acknowledged, enforcement of *sasi* regulations is more effective. Formal and traditional institutions should also collaborate closely with religious authorities. Where there are strong bonds among these institutions, *sasi* is highly resilient. On the other hand, political instability and weak leadership seriously hamper *sasi* as well as any revitalization process.

For optimal collaboration between *kewang* and the police in enforcement, a clear definition of rights and mandates should be developed. *sasi* regulations are considered more legitimate and compliance increases if the villagers profit directly from management. It is necessary to define the *sasi* structures, powers and responsibilities within the framework of provincial and national legislation, to provide local institutions with more capacity to deal with external threats and become involved in development planning, execution and evaluation.

Collaboration requires a shared value system, in this case *adat*. Where through modernization the younger generation develops new values, the institution must adapt. Collaboration, trust and legitimacy are a function of a village size and homogeneity. In larger, more heterogeneous villages another type of management institution ie, not traditional *sasi*, needs to be established. While revamping the institution to increase functionality in resource management, it will be useful to retain traditional titles and structures as well as elements of ceremony, to provide a strong spiritual and cultural basis. However, care must be taken not to alienate new generations of fishers.

The 1990s appear to be a critical decade, ie, *sasi* must adapt to modern society and gain formal legal status or it may, at the operational level, cease to function. There are various options for providing a legal basis for local management bodies, including drafting of new provincial laws or amending existing national legislation (Zerner 1992).

In conclusion, the *sasi* institution has sufficient benefits that it can and should be used as the basis for building local level management institutions. *Sasi*, however, takes many forms and it requires further study to determine the optimal configuration. Extension of the inventory would provide a better picture of how widespread *sasi* and other village-level management efforts are. It would also be worthwhile to investigate the motivations of blast fishers and the influence of *sasi* and *adat* on this activ-

ity. Case studies to clarify the role of *adat* and religious leaders, to identify key contextual factors and incentives, and to study resilience in Muslim villages are needed. There is also a need to follow up on progress of revitalization in Hulaliu, Tuhaha and other sites.

More detailed biological assessments inside and outside of guarded *sasi* areas would be extremely useful in quantifying the impact of different forms of *sasi*. Is habitat better protected when harvest rights are auctioned or sold and then protected by private guards or when they are guarded by a *kewang*? Which fisheries' rules directly or indirectly protect fisheries habitat and to what degree? Biological research should also be performed comparing *sasi* areas of different sizes in order to investigate impacts on fish numbers and diversity. Is there an optimal size for a protected area? Would no-take zones located in or near *sasi* areas increase productivity?

Once more information is available, a small number of alternative *sasi*-based institutions could be devised, combining what appear to be the best attributes of traditional institutions now in place. These alternatives could then be tested at pilot sites and results fed in to fisheries policy and legal reform.

## REFERENCES

- Novaczek, I and Harkes, I. 1999. *An Institutional Analysis of Sasi Laut in Maluku, Indonesia*. Technical report, ICLARM.