

Institutional resilience of *sasi laut*, a fisheries management system in Indonesia

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Abstract

In Maluku Province, in eastern Indonesia, natural resources are managed under a locally defined set of rules and regulations called *sasi*. *Sasi* has been in place for over 400 years. It is embedded in the local culture and based on customary law (*adat*). While *sasi*, or remnants of it, are still being practiced on most islands (Ambon, Seram and the Lease Islands), in parts of Maluku it is in the process of dying out. From 1996-1998 a study was carried out by researchers from ICLARM (Philippines) and Yayasan Hualopu, a local NGO, to study the presence of *sasi*, the degree of activity and the reasons for loss or survival of *sasi*. The results of the study can be useful in the revitalisation of traditional institutions or in the process of institution building in the context of co-management.

Introduction

Maluku is a province of over a thousand islands (see map). The island communities are highly dependent on marine resources. Over the past 30 years, there has been an expansion of the small-scale commercial and industrial fishery in the area. One unfortunate result is increasing conflicts between traditional fishers and industrial fishers, destruction of coral reefs by illegal fishers and decline of fish catches (Zerner 1994). Because of the size and complexity of the area, fisheries management, stock assessment and law enforcement are expensive and difficult.

Since the 16th century, resources in Maluku have been managed under a system called *sasi*. *Sasi* can be defined as a set of regulations that govern resource use and that seem to specifically aim to avoid the premature harvest of forest and marine products (Nikijuluw 1995). *Sasi* is usually applied to specific areas on land or in the sea, but can also concern social behaviour. Marine *sasi* (*sasi laut*) prohibits the use of destructive and intensive gear (poisonous plants and chemicals, explosives, small mesh lift-nets), but also defines seasonal rules of entry and harvest and activities allowed in specific parts of the sea. The regulations are guarded and enforced by an institution known as the *kewang*, which functions as a local

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police force. Their legitimacy, as well as that of the *sasi* institution itself, is based on *adat* or customary law.

Despite its profound cultural embeddedness, *sasi* has changed under external influences such as trade (the spice wars), colonisation (by respectively the Portuguese, the English, and the Dutch), religion (Christianity and Islam), and the merger into a national government structure in the 1970's. Current threats to the system are modernisation, commercialisation, and the general loss of traditional values. As a result, some villages have not been able to maintain *sasi*. At the same time, however, other villages have a strong and functional *sasi* system both on land and water. This paper tries to analyse when *sasi*, or aspects of *sasi*, disappeared, which factors cause its decline, but also which factors make it survive. Understanding this process and the factors behind it will help to develop, maintain, or revitalise *sasi* and other fisheries management systems.

The first part of the paper presents the general patterns of decline of *sasi* in the region. The second part is more in-depth and tries to uncover the changes and factors that influence the elements of the *sasi* institution in selected villages. In the synthesis and conclusion the results of the two studies will be compared and combined in order to identify what we have learned from the system.

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Institutional resilience defined

The questions above can be translated in what is called *institutional resilience*. A social institution consists of all the structural components of a society (patterns of behaviour) through which the main concerns and activities are organised and social needs are met (Goddijn *et al* 1980). This general definition can be narrowed down when we look specifically at resource management systems. Berkes and Folkes (1998) distinguish two major functions of a resource management institution: 1) To control access to the resource to exclude foreigners, and 2) To institute rules among users to solve the conflict between individual and collective interests in order to equally divide the resource benefits. The first is called the exclusion problem, the second the subtractability problem. A useful definition then is the one by North (cited in Berkes and Folkes 1998) who describes an institution as the formal and informal constraints or rights and rules and their enforcement characteristics. Examples of formal constraints are rules, laws and constitutions; informal constraints are norms of behaviour, conventions and self-imposed codes of conduct.

Resilience can be defined as the degree to which a system can cope with change without collapsing, or, the ability of a system to absorb perturbations by actively adapting to an ever changing environment (Folke and Berkes 1995). Pollnac (1994) adds to this that the degree of adaptability depends on the specific circumstances of a system. Reduction in resilience means that vulnerability increases, with the risk that the system crosses a threshold and collapses (Folke and Berkes 1995). In other words, where institutional resilience is low, the management system is likely to collapse.

Institutional resilience can therefore be defined as the formal and informal rules and regulations that are in force to secure the right of exclusion and extraction. Important hereby are the enforcement characteristics of those regulations and changes as a result of internal and external influences.

Methodology

The study of institutional resilience was part of a larger study on the performance and impact of the marine *sasi* system (*sasi laut*) in Maluku using the Institutional Analysis Framework (ICLARM-IFM 1996). The overall study comprised four components: 1) Identification of the extent and operation of *sasi laut* systems in 63 villages in the Lease Islands, 2) A performance and impact analysis of the *sasi laut* system in 22 villages, 3) Comparative institutional analysis of six case-study villages, including biological surveys, and 4) a study on the market structure, fisheries policy and the role of the state in fisheries management. The project results are described in Novaczek and Harkes (1998).

Village	Sasi	Island
Nolloth	Strong	Saparua
Haruku	Strong	Haruku
Tuhaha	In the process of revitalisation	Saparua
Hulaliu	In the process of revitalisation	Haruku
Toisapu-Hutumuri	Disappeared	Ambon
Seri	Disappeared	Ambon

Table 1. Case study villages and activity of *sasi*

The resilience study is based on quantitative information from the inventory, the performance study, and the comparative case-study of villages with active *sasi* and those where *sasi* has disappeared or is in the process of revitalisation (Table 1). In addition, key informant interviews covered questions on 1) the objective of *sasi*, 2) the rules and regulations, 3) the role of traditional village institutions, 4) boundaries, 5) compliance and enforcement, and 6) external factors having an impact on the institution. A central issue in asking these questions was change over time.

Objective of *sasi*

The general objective of *sasi*, according to the respondents, is to protect resources from theft and destruction through active monitoring and enforcement. In Nolloth, for example, there are lengthy closed seasons and a minimum legal size for top shells (*Trochus niloticus*) harvested. In Haruku, destructive and overly efficient gear types are banned. Thus in these cases *sasi* does have a conservation objective. Nolloth also illustrates that *sasi* has developed a more economic function with the harvest rights of top shell being auctioned off by the village government when they became more commercially interesting in the 1960s. This was to the dismay of some villagers who saw their personal direct benefits decrease.

A shift from communal harvests to the sale of marine harvest rights occurs in most villages where *sasi* is revitalised by a local government with commercial interests. In both Tuhaha and Hulaliu, village heads plan to auction the harvest rights and use *sasi* revenues for village

development. However, fishers declared that they would respect *sasi* only if they would get direct benefits from a communal harvest.

Rules and regulations

Nolloth, Haruku and Hulaliu have written *sasi* regulations. The set of rules comprises operational rules which specify the products under *sasi*, gear restrictions, and the timing of the harvest, and collective rules which define the decision-making process for closures, access, and enforcement. The third level, the constitutional rules, is defined through *adat*. *Adat* prescribes which persons are involved in *sasi* and what their role is, e.g. who or which clan is responsible for decision-making, conflict resolution, execution of ceremonies and enforcement (see also Ostrom 1990).

The process of decline involves non-compliance to operational rules but this in turn is directly dependent on the effectiveness of the collective choice rules. In Hulaliu, for instance, a conflict between the village head and *kewang* in which the *kewang*'s rights were neglected (i.e. a collective level problem), was the root cause for *sasi* to decline. Subsequent problems with compliance (operational level) were secondary. *Adat* as part of the village culture, however, persisted, and thus the constitutional rules remained intact.

Over the last decades operational rules have been modified. Boundaries of *sasi* areas, frequency of open and closed seasons, division of benefits, restrictions on gear use all may and do change. In practical management terms, this affects the function of *sasi* but does not threaten its continued existence. On the other hand, where the constitutional rules were challenged, e.g. a shift of authority from the *kewang* to the church, the loss of the *kewang*, the introduction of police as enforcers, the promulgation of national fisheries legislation, then the structure or legal basis of the *sasi* institution changed and this can lead to disappearance of part or all of a local *sasi* institution. On the other hand, adaptation of constitutional rules may strengthen *sasi*. One example is Haruku where the people requested the church to become involved in land *sasi*. This now functions complementary to the *kewang*, who are mainly responsible for marine resources.

Because operational and collective rules seem to break down more easily, they, as particular entities, are less resilient than constitutional rules. However, the fact that operational rules, and to a lesser extent the collective choice rules, can be changed or abandoned and then revived is an important feature contributing to adaptiveness and resilience of the larger institution.

Patterns of loss of *sasi* since the 1940's

It was expected that villages surveyed would not be homogenous. Therefore, to display the information, the villages have been grouped by three different features: by dominant religion (Muslim and Christian), by population size (class 1: <1000 people; class 2: 1001-2000; class 3: 2001-3000; and class 4: >3000) and by island (as to indicate, for example, the proximity to the urban centre, Ambon city).

Loss of the entire sasi institution

Of the 63 villages studied, in 19 villages the entire *sasi* institution was lost (Table 2). Most losses occurred in the 1990's and on Ambon and Saparua. On Haruku Island, by contrast, some form of *sasi* has survived in every village.

Sasi institution lost (n=19)	Seram n=1	Ambon n=11	Haruku n=0	Saparua n=6	Nusa Laut n=1	Total n=19
lost in 1990's	5%	16%	0%	16%	5%	42 %
1980's	0%	11%	0%	0%	0%	11%
1970's	0%	16%	0%	5%	0%	21%
Earlier	0%	16%	0%	10%	0%	26%
Total	5%	58%	0%	32%	5%	100%

Table 2. Attrition of *sasi* institution (i.e. total loss of all forms) on each island. Note, one village in Ambon never had *sasi*

Losses have been steady in both Muslim and Christian villages (Table 3), but there is a clear difference when you consider village size. Losses have been greatest in size class 4 (>3000 people) and much less in size class 3 (2000-3000). Apparently, there is an optimum size for villages with regard to *sasi*.

Sasi institution lost (n=19)	Class 1 (<1000) n=5	Class 2 (1-2000) n=5	Class 3 (2-3000) n=1	Class 4 (>3000) n=8	Muslim n=9	Christian n=10
lost in 1990's	40%	60%	100%	25%	44%	40%
1980's	20%	20%	0%	0%	11%	11%
1970's	20%	0%	0%	37,5%	11%	30%
Earlier	20%	20%	0%	37,5%	33%	20%
Total	100%	100%	100%	100%	100%	100%

Table 3. Attrition of *sasi* institution in villages of various sizes and religion. Note, the village that never had *sasi* is a village of Butonese immigrants, size class 4

The erosion and loss of marine sasi

Active marine *sasi* institutions are hard to find. Out of 63 villages inventoried, only 17 had some form of marine *sasi* and a number of these were not functioning (Table 7). Before, marine *sasi* was much more prevalent. We documented 18 villages that lost marine *sasi* in living memory (Tables 4 and 5), meaning that at one time at least 35 villages (56%) had this institution.

Marine sasi lost (Total n=18)	Class 1 (<1000) n=7	Class 2 (1-2000) n=5	Class 3 (2-3000) n=1	Class 4 (>3000) n=5	Muslim n=4	Christian n=14
1990's	0%	0%	0%	6%	6%	0%
1980's	17%	0%	0%	0%	0%	17%
1970's	11%	6%	0%	6%	0%	22%
Lost earlier	11%	22%	6%	17%	17%	39%
Subtotal (lost)	39%	28%	6%	28%	22%	78%

Table 4. Attrition of marine sasi in relation to village size and religion

Central Maluku villages (n=63)	Class 1 (<1000) n = 12	Class 2 (1-2000) n=17	Class 3 (2-3000) n=17	Class 4 (>3000) n=17	Muslim n=20	Christian n=43
Total that now have or once had marine <i>sasi</i>	13%	14%	17%	13%	14%	41%
Never had marine <i>sasi</i> or lost from memory	8%	11%	10%	14%	17%	27%
Total	21%	25%	27%	27%	32%	68%

Table 5. Presence of marine sasi in relation to village size and religion

In over half the cases where marine *sasi* has been lost, the loss occurred prior to 1970 (Table 6). Since then, marine *sasi* has been relatively stable compared to land *sasi*. Most losses in the 1970s to 1990s have been in either Class 1 or Class 4 villages, and in the 1990's the only recorded loss was on Ambon Island (Table 6).

Marine sasi lost (n=18)	Seram (n=1)	Ambon (n=6)	Haruku (n=2)	Saparua (n=4)	Nusa Laut (n=5)	Total (% of losses)
1990's	0%	6%	0%	0%	0%	6%
1980's	0%	11%	0%	0%	6%	17%
1970's	0%	6%	0%	11%	6%	22%
Earlier	6%	11%	11%	11%	17%	56%
Total	6%	33%	11%	22%	28%	100%

Table 6. Attrition of marine sasi per island

Factors influencing activity of *sasi*

The level of activity of both marine *sasi* and *sasi* on land was measured in each of the 63 villages using indicators for the presence of *sasi* (rules), closures (open and closed season), consistency of application (frequency over previous 3 years) and local effort (signage and enforcement). The maximum activity score is 12. Using this system we find that land *sasi* is significantly more active in size class 3 villages (ANOVA, $p=0.01$).

Village	Dominant religion	Homo-geneity	Administrative Status	Size Class	Activity score for <i>sasi</i>	
					Land	Marine
Nolloth	Christian	1	Desa	3	12	12
Haruku	Christian	1	Desa	3	11	12
Pelau	Muslim	1	Desa	4	12	12
Siri Sori	Muslim	1	Desa	3	n.a.	12
Morela	Muslim	1	Desa	3	11	12
Itawaka	Christian	1	Desa	3	11	10
Amahai	Christian	1	Desa	3	12	10
Kabau	Muslim	1	Desa	3	n.a.	9
Ihamahu	Christian	1	Desa	2	12	9
Tengah-Tengah	Muslim	1	Desa	3	12	9
Hatusua	Christian	2	Desa	2	9	9
Porto	Christian	1	Desa	4	10	7
Paperu	Christian	1	Desa	3	9	6
Ulath	Christian	1	Desa	2	6*	6*
Makariki	Christian	2	Desa	2	12	3
Rohua	Christian	1	Dusun in a Muslim desa	3	12	3
Haria	Christian	1	Desa	4	8**	3**

Table 7. Factors related to activity of marine *sasi* in central Maluku. Homogeneity status: 1 = 95-100% is of dominant religion; 2 = 60-80% is of dominant religion. * *Sasi* moved to church in 1992; ** *Sasi* moved to church in 1995

In Maluku, fishing villages are most often overwhelmingly Christian or Muslim. The seven villages where marine *sasi* was most active (score 10-12, see Table 7) were all homogeneously Christian or Muslim, i.e. with at least 95% of the population being of the dominant religion. Out of 17 cases of marine *sasi*, three were inactive (score 3) and another three were weak (score 6-7). One of the cases of inactive marine *sasi* occurred in a relatively non-homogeneous village and a second case was in a Christian hamlet attached to a predominantly Muslim village. Cultural homogeneity can thus be important to the resilience of this traditional institution.

	Adat sasi village (n=15)	Church sasi village with no adat sasi (n=21)	Muslim sasi village (n=6)
Never had marine sasi	20%	48%	50%
Lost marine sasi in living memory	13%	33%	0%
Has marine sasi now	67%	19%	50%
	100%	100%	100%
Historical occurrence of marine sasi (ever had it)	80%	52%	50%
Percentage loss from historical total	17%	64%	0%

Table 8. Loss of marine sasi in villages with different types of sasi institution

The persistence of marine *sasi* is also linked to the fate of other parts of the institution. Villages with marine *sasi* usually have active land *sasi*. Where marine *sasi* has been lost for some reason, the land *sasi* institution that is left behind is also weak (Table 8).

Resilience of marine *sasi* is also linked to the interplay among governing authorities. It has been stable in the Muslim villages where the institution is governed neither by *adat* authorities nor religious leaders (Table 8). In a number of cases *sasi* on marine resources was abandoned or weakened when *adat sasi* was taken over by the church. The activity score of marine *sasi* is significantly higher in villages having *adat sasi*, and lower in villages having church *sasi* (ANOVA, $p < 0.05$).

Reasons for loss of *sasi* between 1940 and 1997

During the inventory of the 63 villages, we asked whether our informants could remember when some aspect of *sasi* changed or was lost, and why this had happened (Table 9). Explanations were often quite explicit and included contextual information pertaining to the evolution of socio-political systems in Maluku. The comments were merely applicable to villages where *sasi* actually was lost or transformed. The numbers represent the number of comments, not the number of villages.

Cause mentioned for decline of sasi	No of times mentioned
<i>Take-over of adat sasi by church</i>	13
<i>Poor leadership led to decline in enforcement and compliance</i>	11
<i>Economic pressures led to non-compliance</i>	4
<i>Change in administrative boundaries</i>	3
<i>Conflict over leadership (adat and formal government)</i>	3
<i>Conflict between church and adat or between churches</i>	2
<i>Conflicts over land rights caused compliance problem</i>	1
<i>Urbanization and degradation of resources</i>	1
<i>Collapse of clove price increased fishing pressure</i>	1

<i>Other (moral disintegration, outsider interference, more heterogeneous population, war)</i>	4
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Table 9. Reasons causing *sasi* to become (partly) non-functional

Weak leadership and conflicts are key elements in erosion of *sasi*. In the opinion of villagers, conflicts within the village government, conflicts between the village leader and *adat*, conflicts between the village leader and the *kewang*, conflicts among church organisations, and conflicts over land all resulted in partial or complete loss of the institution. Conflict between *adat* leaders and village government leading to erosion of *sasi* was reported only in Christian villages and never on Nusa Laut.

Confusion over land and rights was in some cases due to changes in government unit boundaries. In addition, pressure from worsening economic conditions has been mounting since the collapse of the clove price in the early 1990's. Crop failure and decline of the resource were also mentioned as a causing *sasi* to collapse. Changes in administrative boundaries and the effects of World War II were most prevalent on Ambon and Nusa Laut.

The lack of effective enforcement, in combination with economic needs, political turmoil, and urbanisation provided the incentives for people to non-comply. Compliance and enforcement problems seem more prevalent in Christian villages, and particularly on Ambon Island. In eight cases, the village government delegated the authority over *sasi* to the church. Often this was accompanied by a decline in *sasi adat* and marine *sasi*. As of 1997, political or religious conflicts were documented as affecting 12 of the remaining *sasi* villages. In other words, in about a quarter of remaining *sasi* villages the institution is under strain.

Results of the comparative case-study

The findings from the in-depth interviews conducted as part of the case-studies in the six villages, underscore the link between the different components (objectives, rules), the players and the external context of the *sasi* institution and illustrate the interactions among these through time.

The main differences between the strong *sasi* villages are:

- ✂ In Nolloth the benefits from *sasi* accrue to the village government, while in Haruku they are distributed among the villagers.
- ✂ Nolloth is politically more stable than Haruku where the village head has a disputed position.
- ✂ In both villages the *kewang* are active, but in Haruku they are more active in resource management issues.

The main differences between the villages that lost *sasi* are manifested in the process of decline:

- ✂ In Hulaliu decline was caused by conflicts between the village head and *kewang*, as a result of confiscation of resource rent. In Tuhaha the traditional village authorities were bypassed by the new, formal village government.
- ✂ In Hulaliu the current leader has a weak position, the village is divided and lack of support hampers the process of revitalisation. In Tuhaha, the position of the traditional authorities needs to be restored, including a *kewang*, before *sasi* can be re-established.

Between the villages that lost *sasi* differences are less clear. Characteristics of these villages are:

~~///~~ In both Toisapu-Hutumuri and Seri traditional village structures are to a large extent replaced by formal structures.

- ✂ Artisanal fishers have to compete directly with large-scale fishers.
- ✂ Both villages lie on Ambon and close to regional markets and hence are more in contact with modernisation and urban processes.

In the remainder of this paper we describe the various elements of *sasi* and provide an analysis of how *sasi* functions and persists under different conditions.

Role of traditional institutions

Even though Law No. 5, 1979 is expected to have caused confusion in the village, in the perception of ordinary villagers it had no dramatic and immediate impact. Apparently, the requirements of the law, i.e. replacement of the traditional government structure by a formal one, were often implemented at a pace and in a manner suited to the local situation. In most cases the local government basically incorporated the traditional structure into the formal one, and thus change was not clearly visible. Some villages have been rather successful in melding the formal and traditional government structures (i.e. Nolloth). In others, traditional authorities became marginalized (i.e. Tuhaha), or where newcomers entered the village government through elections, villages became politically unstable. In all villages there is some degree of overlap between formal and traditional authorities. The study shows that the degree of overlap is decisive for the continuation and stability of *sasi*. In Nolloth where the traditional authorities function within the new system the *sasi* institution is strong. The villages where *sasi* ceased to function had problems with village leaders who did not successfully collaborate with traditional authorities.

The rituals and knowledge of *sasi* are passed on by certain lineages and persons and are secret and involve an almost extinct indigenous language (*bahasa tana*). In order to preserve traditional *sasi*, it is imperative that the process of passing down of knowledge is perpetuated. Many youngsters, however, lose interest in *sasi*. The process of ‘modernisation’ accelerates as the younger generations leave to study in Ambon city where *adat* is regarded as a superstitious belief. There is a risk that when “the keepers of *sasi* knowledge” die, they will take their knowledge with them. The support and participation of the younger generation, however, is necessary for the success of *sasi* as a viable management institution.

Leadership

Where government officials lack knowledge and are poorly informed about village issues, government decision-making may rest almost exclusively with the village head. The modern village head, thus, may hold a very powerful and authoritarian position and as such he is a key decision-maker in the *sasi* institution.

Before 1979 the position of village leader was hereditary through the royal *raja* line. Nowadays the people elect the village head. Nolloth is a fine example of a situation where the village head was selected because he is the *raja*. This allows him to lead the formal village government and to also be fully and legitimately involved in traditional ceremonies.

Our results support those of Riedel (1886) and Volker (1921) who maintained that compliance to *sasi* rules depended largely on strong and tactful leadership. The village head must be honest and respected or *sasi* is undermined. In addition, local legitimacy is very important and this still stems largely from being part of the *raja* family line. In some villages, formally elected leaders are not legitimate either because they are not from the right family or because the people think a different member of the *raja* line would be more competent or more attuned to villagers' aspirations. Where a village head lacks legitimacy this can undermine *sasi*.

External interests may influence the election of a village head, as was reported in Haruku and also in Hutumuri. Elections can be manipulated either in favour of or against traditional leaders. Under the Indonesian system, all candidates must be screened and approved by the government. Popular candidates may be disqualified at this stage, or some votes may simply be neglected during the election process. On one hand, lingering *adat* structures may make nonsense of the concept of democratic elections; on the other hand, traditional leaders with broad popular support may also be vulnerable.

The boundaries

Marine *sasi* is generally applied to shallow inshore areas. Outside the *sasi* area, other parts of the village territory, including deep water beyond the fringing reef, may also be rented out to outsiders. Generally, boundaries of the *sasi* and other rented areas are clearly defined, have remained largely the same over the years and are generally accepted. Fishers may accept areas of restricted access without complaint, but they do have reservations. For some non-*sasi* rented areas, the lack of legitimacy is compensated by a strong enforcement mechanism. Crucial in acceptance of boundaries of restricted areas are legitimacy of the leaders, direct benefits for the excluded users and a strong enforcement mechanism.

Enforcement and compliance

Enforcement of *sasi* regulations is carried out by the *kewang*, the police, and/or the village government. In Nolloth and Haruku the *kewang* is strong and plays an important role in the enforcement of regulations. In coastal villages there is still a firm belief that ancestral spirits and God guard the *sasi* regulations. Even in cases where the village government is responsible for enforcement, traditional sanctions can still play a role.

The traditional *kewang* is highly legitimate and not in the least because they enforce the law without showing favouritism. The police have the formal authority to implement the rules, but act arbitrarily and are not trusted by the people. Their effectiveness is also hampered by the fact that they reside far from the village and when they are needed, they take too long to arrive. In villages that have no active *kewang* enforcement is difficult. Enforcement authority has shifted from the traditional enforcers to the formal village government. In Christian villages, however, the government may have enforcement support from the church. In Nolloth the church minister closely collaborates with the village head and the *kewang* and he is also present at *adat* ceremonies including those of marine *sasi*. In non-*sasi* villages the church was not seen to play a role in supporting enforcement of fisheries rules.

Where *sasi* is functional, compliance with fishing rules in general is higher than in non-*sasi* villages. Non-compliance by local villagers is not usually a threat to the *sasi* institution, but is a sign of decline which is likely based in problems at the collective choice or constitutional

levels. Non-compliance may also be directed at an authority figure rather than at the *sasi* institution per se. Non-compliance by either locals or outsiders and which is not effectively controlled by the *kewang* is a threat to *sasi* because it is an incentive for people to abandon local management. Although usually intrusion in *sasi* areas is low, in times of economic and political stress the rate of non-compliance can increase.

External influences

In and out-migration and (limited) tourism have no impact on village demography and appear to pose no threat to traditional institutions. Tourism in Haruku, stimulated by *sasi* ceremonies, may even help support the institution. Compared to the villages on Ambon, the communication and transportation links of the villages on Haruku and Saparua are limited. Seri and Hutumuri are heavily influenced by their proximity to Ambon city. It is here that the loss of *adat* ideology and tradition is largest. In these non-*sasi* villages the perceived importance of *sasi* is significantly less than on the outer islands. Apparently, the greater involvement of people in the process of modernisation and globalisation affect the appreciation that people have for *sasi* and traditional structures. This is an important aspect to take into account when reinstitutionalising *sasi* or developing a comparable management institution that must be widely applicable.

Pollution and resource degradation resulting from modern development also pose a challenge to local resource management. The villages on Ambon see their resources decline due to pollution from fish and plywood factories. The environmental impacts of these operations, however, are such that they would be beyond the control and influence of a traditional style village *kewang*. Revitalized local institutions require information management, networking skills and links to government departments that have jurisdiction in environmental protection.

An example of the impact of large-scale development is Haruku, a village that is influenced by mining exploration for copper, silver and gold. This enterprise seriously affects the political stability in the village and also emphasizes the limits of a village-based management institution that is not linked to higher levels of government. The *sasi* institution does not offer villagers the ability to intervene in regional development planning and licensing of mining operations. The *kewang* is powerless to prevent pollution from mining activities affecting *sasi* resources, and there is no provincial or national management body to which they can appeal.

National laws and programmes are implemented through the provincial, district and sub-district government offices, but information on fisheries and environmental law rarely reaches the village level. Knowledge of fisheries regulations is fragmented and generally fisheries regulations are poorly implemented. There are no government patrol boats in the area, and where it comes to protection of fishing rights, the villages are left to their own devices. This may motivate people to work together in defence of local resources. On the other hand, if *sasi* as an institution remains disconnected from governmental power centres, people may give up local operational rules because they are ineffective against externalities.

The revival of *sasi* in Central Maluku

At this moment, fisheries management is not yet a burning issue in most villages because reduced catches are compensated by high fish prices. Few village respondents have any clear idea of what fisheries management would entail, and rather think that the answer to declining

catches is to upgrade their boats and gear. Nevertheless, all fishers in *sasi* villages said that *sasi* is useful and important, as did 90% of fishers in villages where *sasi* is being revived and 70% of fishers in non-*sasi* villages (Novaczek and Harkes 1998). In 14 villages, respondents expressed their desire to reintroduce *sasi* (land, marine or both), or strengthen existing *sasi* practices.

The tendency to revitalise *sasi* is fed by the appreciation of *sasi* by the people, not just as a management system, but as a cultural phenomenon. Where *sasi* is still alive, people explained: “*Sasi has a spirit, and everybody carries it because it is adat and part of their culture.*” The constitutional rules of *sasi* are part of *adat* and they cannot be separated from the local culture. It is at this level that *sasi* as an institution has its strongest resilience. This explains why *sasi* is still spiritually and ideologically significant, even where the practical execution of *sasi* has vanished.

In Hulaliu and Tuhaha the village elites are seriously attempting to revitalise *sasi*. In both cases the reason for revitalising *sasi* has less to do with its spiritual significance and much more to do with the possibility of controlling common property resources to generate government income (see also von Benda-Beckmann *et al.* 1995). In considering revitalisation processes it pays to look back to what caused the loss of operational *sasi* in the first place.

The main reasons for the collapse of *sasi* in both Tuhaha and Hulaliu were political problems, lack of trust among village leaders and the subsequent withdrawal of the *kewang*. The practical execution of *sasi* was abolished but *sasi* remained part of the village ideology. The process of revitalisation builds on this cultural base and re-establishment means reinstallation of the traditional authorities and reactivation of collective choice and operational rules. *Kewang* members have to be chosen and inaugurated, tasks delegated between the formal and traditional authorities and operational rules designed. To be successful, the proponents of *sasi* renewal will have to pay attention to history and be careful to avoid past practices that led to breakdown.

In recent years local NGOs have been working in the Lease Islands. They provide villagers with information on sustainable fisheries development and encourage local leaders to embark on the management of village territorial waters. In short, in the process of revitalization there are three streams of thought which must be reconciled: the wish of the village fishers to preserve *adat* culture and share in the benefits from fisheries resources while protecting their territories from outsiders, the desire of local governments to extract resource rents and the push by academics, environmentalists and managers to develop viable local fisheries conservation and management.

Conclusion

Berkes and Folke (1998) claim that institutional resilience is a built in mechanism to react to external influences. Various social-ecological practices they mention are found in *sasi*, e.g temporal restrictions of harvest, intergenerational knowledge, role of stewards, taboos and regulations, sanctions and ceremonies etc. However, our study shows that these are not the mechanisms, but the components of the institution itself, and as a consequence apt to change. What makes the institution, including all these components, strong (and thus resilient) is that which links these components i.e. legitimacy, trust, collaboration, transparency, etc.

Additionally, relations between those who benefit from the institution and those who manage it need to be sincere and transparent.

A shared notion of the relevance of the institution stimulates a common objective to maintain it, in spite of external influences and in a situation where the temptation to abuse the system for personal benefits is strong. The extent to which external factors affect the social structure in the village depends on the feedback mechanisms, i.e. the degree to which the local institution itself can mitigate the effects of external perturbations. Holling (in Berkes and Folke 1998) speaks in this context of adaptive management. *Sasi* has already outlived repeated predictions of imminent demise (Volker 1925, Cooley 1962) and is clearly both adaptive and resilient. There is therefore hope of rebuilding the institution in the form of a modern element in co-management, in which the needs and aspirations of the various proponents (fishers, local governments, *adat* leaders, environmentalists, fisheries managers) can be successfully accommodated.

From our study we identified the following factors (components and linkages) that contribute positively to the resilience of *sasi* as a local institution and therefore should be considered during the process of revitalizing and modernizing the institution.

1. If the village head descends from the traditional royal *raja* line and if he is a traditional authority, his position is more legitimate than in villages where this is not the case. This legitimacy contributes positively to the execution of his authority with regard to *sasi*.
2. Where the village head is elected with only a small majority, this results in fragile leadership and subsequent political instability. This seriously hampers *sasi* as well as any revitalisation process.
3. A large overlap between the traditional and formal authorities in the village government is a strong indicator that *sasi*, as part of the traditional structures, will be prolonged.
4. Vital for the process of revitalisation is acknowledgement of the traditional village authorities within the new structure.
5. Where traditional institutions such as the *kewang* are acknowledged, enforcement of *sasi* regulations is more effective. If collaboration with the police or other formal institutions is required, a clear definition of rights and mandates should be developed and approved by higher government levels.
6. It is important that the formal and traditional institutions collaborate closely with religious authorities, such as the church or Muslim institutions which are generally stable and not involved in village politics. Where there are strong bonds among these institutions, *sasi* is highly resilient.
7. 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.
8. In newly to be installed *sasi* systems, *sasi* regulations are considered more legitimate if the villagers profit directly. In villages where *sasi* rights are auctioned and people have no control over the revenues there is no incentive to comply with the *sasi* regulations.
9. Collaboration requires a shared value system, in this case *adat*. Where through modernization the younger generation develops new values, the institution must adapt.

The support and participation of the younger generation is necessary for the survival and effective operation of *sasi*.

10. Collaboration, trust and legitimacy are a function of a village size and homogeneity. When the population exceeds 3000 people and/or the village becomes heterogeneous, the cohesive mechanisms break down. In these villages another type of management institution i.e. not traditional *sasi*, needs to be established.
11. 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.

In order to perpetuate the cultural core of *sasi*, the sacred knowledge and rituals in the indigenous language must be passed down before they are forgotten. Berkes and Folke (1998) mention TEK (traditional ecological knowledge) as the basis of management practices. *Sasi* although it limits resource use, is in most cases not explicitly a management system i.e. a conscious effort to manage and conserve the resource. Detailed knowledge of the resource base and related natural systems are lacking, whereas non-scientific and magical explanations for resource decline are still current. In this case it is the loss of traditional knowledge concerning *sasi ritual*, not local loss of *ecological knowledge*, which is a threat to the resilience of the *sasi* institution. The trend to loss of *adat*-related knowledge was already clear decades ago when Cooley (1962) concluded that *sasi* “as part of the *adat* system ... seems completely doomed in the very near future”. It is interesting that 35 years later we are witnessing not just stability but resurgence in at least one form of *adat* institution: marine *sasi*.

Glossary

Adat	= Customary law and ritual practices
Kewang	= Traditional enforcer of <i>sasi</i> rules
Raja	= Village leader from the traditional royal clan
Sasi	= Sets of rules which regulates resource use and social behaviour
Sasi adat	= Sasi based on <i>adat</i>
Sasi darat	= Sasi on land products
Sasi gereja	= Sasi enforced by the church
Sasi laut	= Sasi on marine resources

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