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**Nuaulu protection of forest, forms of ritual regulation,
and the recent history of forestry practices in eastern
Indonesia**

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Nuaulu people on the island of Seram in the Indonesian province of Maluku (the Moluccas) sustainably manage forest resources (timber and other products) that they need to build sacred houses, and to provision feasts that accompany important rituals. They do this through a system of protected areas (*sin wesie*). This form of regulation is examined in relation to the literature on a much-discussed set of institutions described for the Moluccas more generally (*sasi*), that have come to feature prominently in debates on how customary practices can

be adapted to deliver conservation objectives. Reference is also made to a third cultural practice (*matakau* or *wate*), scare charms that overlap in some of their functions. The paper compares and analyses the interconnections between these three forms of regulation in the context of deforestation, social change and the recent history of state interventions in forest management practices.

Keywords: Nuaulu, Moluccas, forests, ritual regulation, forestry practice

Introduction

The 1990s saw much discussion of mechanisms used by traditional societies that appeared to have the effect of sustainably managing natural resources, and which might be harnessed in the service of community-based conservation (e.g. Western and Wright 1994). This complemented emerging recognition of the environmental sensitivity and intelligence of traditional peoples among those in the developing global green movement (Ellen 1986). The discussion also built upon claims emanating from the neo-functional ecological anthropology of the 1960s of how ritual might regulate environmental relations in traditional systems of production. The classic work inspiring this approach was that of Roy Rappaport (1968), but the work of Rappaport typifies just the first generation of analyses looking at ritual regulation and sustainability, in which the primary emphasis was on the carrying capacity of ecosystems (see e.g. also Lansing 1991). A second generation, by contrast, has been more concerned with the different

ways in which sacralisation of the environment and traditional ecological knowledge has maintained - indeed extended - biodiversity (Berkes 2008, Posey and Balée 1989). Colding and Folke (2001), for example, provide a useful literature review of social taboos enforcing environmental relations, while Hamilton (2002) has specifically addressed the issue of how resource and habitat taboos (RHT) might protect trees, groves and forest through indigenous sanctuaries.

In the context of Indonesia, similar ideas have found fertile ground (e.g. Davidson and Henley 2007), particularly in observations on the role of local institutions of resource management described generically in the Moluccan islands as *sasi*, and how these have been adapted to modern purposes. Early accounts of AM *sasi*¹ are rooted in the Dutch ‘adatrecht’ literature (e.g. Holleman 1923: 28-39, 144; Volker 1925), and evidently the term could apply to a wide variety of agricultural, forest and maritime resources. Whatever had preceded them, by the late nineteenth and early twentieth century *sasi* had developed into institutional and legal frameworks for regulating – for example - resources ‘in which the security of agricultural crops could be guaranteed for individual groves or collectively held areas’ (Zerner 1994a: 86-7; see also Von Benda-Beckman, von Benda-Beckman and Brouwer 1995). Some of these arrangements remained essentially part of a body of sacred customary law (AM *sasi adat*), others were in Christian and Muslim areas modified by the church and mosque into,

¹ In this paper words in three Indonesian languages are used: Ambonese Malay (AM), Indonesian (Ind.) and Nuaulu (Nua.). Where the term first appears in the text it is accompanied by the appropriate abbreviation.

respectively, AM *sasi gereja* and AM *sasi mesjid*. These regulated production in plantations (AM *dusun*) established to serve religious purposes, while others still were altogether more secular (AM *sasi negeri*) -village *sasi*. For example, Sasaoka and Laumonier (2012) report recent data on how in the Manusela area of central Seram *sasi gereja* were introduced in 2000 to protect coconut, betel and sago, replacing an existing *sasi adat* device, *seli kaitahu*.

As marine resources became commercially important, so these changes were reflected there also. For example, with the growth of *Trochus* shell as an important commodity, *sasi* not only began to be imposed, but their management became increasingly bureaucratized, legalistic, secular, scientific and precise, in contrast to *sasi* traditionally organized through ritual (Zerner 1994a: 91, 93). These arrangements tended to serve the interests of local elites and Dutch colonialists, and Volker (1925) notes how economic benefits generally accrued to a group of local custom specialists or *kewang*. *Sasi*, therefore, became essentially utilitarian in the colonial period (Volker 1925: 295), and could be sold and auctioned (Volker 1925: 24, 305). Though the category of *sasi adat* remained, Ind. *adat* was often deployed in new ways to support *sasi* that were either civil, or in support of churches and mosques. There was increasing governmental control of *sasi*, with opportunities for corruption, potential loss of villager income and consequences for distributive justice. This in turn generated resistance to corporate village *sasi* devoid of AM *pusaka* (that is, sacred intent). By the early twentieth century *sasi* were in decline (Von Benda-Beckman, von Benda-Beckman and Brouwer 1995: 10), and this has been the underlying trend down to the present (Harkes and Novaczek 2003).

The late twentieth century saw some self-conscious re-configuring and upgrading of *sasi* by local people faced with resource depletion. *Sasi* had become weak in many areas by the 1980s (Zerner 1994a: 100), but there had been of a revival in places by the mid-1990s. The apparent success of ‘spontaneous’ *sasi* in the central Moluccas brought them to the attention of the wider Indonesian environmental community through Yayasan HUALOPU, which promoted *sasi* as a socially-equitable system of conservation, and which sponsored a survey (Lokollo and Huliselan 1991) of *sasi*-like practices in Maluku more generally (Zerner 1994b: 1114). Several Moluccan communities received the government Kalpataru award, and the cause was taken up by the then Indonesian Minister of the Environment Emil Salim (Zerner 1994a: 103). *Sasi* was, therefore, resuscitated as a strategy for community-based management practices, ‘reinvented’ if you will as ‘environmental wisdom’ providing solutions to sustainability problems (e.g. Kissya 1995), but with precise topographic coordinates to conform to notions of rationality that echoed those introduced under the colonial jurisdiction (cf Vandergeest and Peluso 2006). Thus, there have been two eras of codification and rationalization with respect to *sasi*: the late nineteenth and early twentieth centuries, and again during the late 1980s and early 1990s (Zerner 1994b: 1115). Moreover, with Emil Salim’s intervention the *sasi* concept was incorporated as part of government rhetoric of development and conservation, with attempts to encourage similar practices in other parts of Indonesia. This, in turn, drew it to the attention of international NGOs and agencies, and there has since been focussed research on the impact of so-called ‘green’ *sasi*, and a critical evaluation of the institution (e.g. Monk et al 1997: 537-557; Zerner 1994a, 1994b; Harkes and Novaczek 2003); see figure 1.

[FIGURE 1 ABOUT HERE]

What is of interest in this historical account is that the re-invention and development of *sasi* in post-independence Indonesia repeated in some significant respects what had happened during the late colonial period: the secularization and rationalization of *sasi* management, the separation of particular *sasi* from a wider set of beliefs and practices of which they were once part, and the process of codification. Moreover, in both periods, *sasi* were often more about the regulation of social rather than ecological relations (Benda-Beckmann, von Benda-Beckman and Bouwer 1992: 2). As Frost (2001: 11, 13) puts it, ‘Sasi’s presentation as “indigenous” and as a system for “resource management” serves a number of different political ends, not all of them ecological’. For example, in Tanimbar – where Frost (2001: 11) undertook her study - *sasi* closure periods in the 1990s would be deliberately lengthened to allow time to work on a new church (p13); or as when marine prices rose during 1998 and the usual ritual sanctions provided an insufficient deterrent to the temptations of pre-emptive harvesting (p14); or when secular village *sasi* were used to generate village revenue (p15); or when officials were accused of corrupt use of the system of fining (p12), and when the opening of a *sasi* was determined less by the regeneration of the stock than by the arrival of *Trochus* or copra traders.

In this paper I examine and compare three sets of social institutions whose purpose is to regulate access to natural resources amongst the Nuaulu population of south central Seram, and which allow us to address some of the issues raised in the burgeoning *sasi* discourse, and that on ritual regulation of forest and allied resources more generally. One regulatory institution (Nua. *sin wesie*) is a specific arrangement for

protecting resources required for major Nuaulu ritual events. The second institution is the more usual arrangement for *sasi* as manifested in that part of the island of Seram encompassing the Nuaulu area, and as described in the general literature. The third is a magical technique (Nua. *wate* [AM *matakau*]) used by individuals and groups to protect crops and other resources from theft and premature harvest. I shall show that while *sin wesie* have plausible beneficial impacts on resource conservation, including forest biodiversity, *sasi* is much more about regulating the relations between different groups, as between Nuaulu and non-Nuaulu. *Wate*, by contrast, is a technique at the disposal of, usually, individuals that focuses on specific locations and resources, and may support the general purposes and functions of the other two.

I also argue that since most attention has hitherto been paid to marine *sasi* (reflecting the commercial interest of key resources), and since the recent focus has specifically been on ‘community-based conservation’ (reflecting NGO and governmental pressure), this has distorted our understanding of the overall context in which this suite of often diverse institutions operate. This is despite the clear recognition by some (Zerner 1994a: 81) that they cannot be essentialized or treated ahistorically. These new data serve to re-balance recent discussion in the direction of terrestrial resources (and forest resources in particular): AM *sasi darat* rather than AM *sasi laut*. More importantly they permit an examination of how social institutions that have the consequence of plausibly regulating certain natural resources in a sustainable fashion might work independent of direct colonial, governmental and commercial pressures, outside the ‘changing hybrid institution’ that is generic *sasi* (Zerner 1994a: 88). As Zerner (1994a: 1117, n39) has noted, we are still ignorant as to what extent

these practices continue to be enacted by local peoples outside the mainstream, and with what effects.

Ethnographic and historical background

My own fieldwork in the Nuaulu area has spanned a period of 40 years, beginning in 1970 and involving nine separate visits. During most of these I have been based in the village of Rouhua, and it is Rouhua data that I largely discuss in this paper.

The people I describe here as Nuaulu today number some 2000 individuals located in six settlements in the *kecamatan* (Ind., subdistrict) of Amahai on the island of Seram (figure 2), within the territorially extensive Ind. *desa* (Ind., local administrative unit)² of Sepa (Ellen 2012b, for most recent published data). Other groups of individuals speaking the Nuaulu language are located in North Seram (where they have been since the nineteenth century) and in the Waraka and Wae Pia area of Elpaputih Bay, where they have lived since the communal unrest in the Moluccas that occurred between 1998 and 2002 (Ellen 2004). Most of those within the traditional domain and *desa* of Sepa still adhere to a belief system and set of ritual practices that sets them apart from most

² *Desa* is usually translated as ‘village’, but in many cases this is misleading as some have populations that are very high, and that cover large areas containing many other local settlements. In 2009 Sepa had an estimated population of 10,000+ and jurisdiction over some 145 square kilometers. As we shall see, this has consequences for effective governmentality, and for the administration of ritualised resource regulation in particular.

Muslims and Christians surrounding them, and which has consequences for how they interact with and manage their environment. Their mode of subsistence focuses mainly on the extraction of sago from *Metroxylon sagu* palms in managed and semi-managed settings, on hunting, on the cultivation of a range of roots, tubers and other crops in swiddens, and on the extraction of a large number of other forest products. There is some freshwater fishing, and a few households engage in marine fishing, though the main subsistence orientation is towards the interior, the forest and mountains, reflecting their self-conception and history as a people.

[FIGURE 2 ABOUT HERE]

Although mostly located away from the coast before the 1880s, Nuaulu have long engaged in exchange relations with the world economy. Before the modern period they were probably contributing mainly forest products (timber, rattan, resin) to the regional exchange economy, though during the twentieth century have been increasingly drawn into a cash economy centred on the production of copra and clove. Their cash-making ventures have diversified in recent decades though the focus is still very much on these two commodities.

The rules relating to Nuaulu land claims are complex and must be seen to operate on several levels. At the highest level Nuaulu are regarded by many local peoples, and certainly themselves, as owning all forest and cultivated land ‘from Makariki to Tehoru’. This is underpinned by mythology, again partly shared with other local peoples. Indeed, before 1880 Nuaulu settlements were distributed over a wide area that is reflected in the language used for toponyms on the first detailed Dutch *Topografische Dienst* maps of 1919. However, given the historically close ‘older sibling – younger

sibling' relationship between the Muslim *kerajaan* (Ind.) of Sepa and the Nuaulu this is sometimes described as Sepa-Nuaulu land. Although Sepa is politically sovereign (Ind. *pertuanan*) in terms of the contract reached between the Dutch colonial regime and the raja of Sepa, in customary terms Nuaulu are widely regarded as the real owners. By contrast, the settlements of Tehoru, Tamilouw, Haya, and Amahai only have access to land along the coast (Ind. *pasisir*). Within this wider area certain places are associated with particular Nuaulu clans based on their history of migration (figures 2 and 3). As Nuaulu villages have been since the 1880s located on the coast, the identification of clan forest is partly linked to known old settlement sites. Thus, areas are designated by their centres rather than their peripheries, and actual boundaries of clan forest are difficult to determine, though lie generally along ridges and encompass valleys rather than following rivers. The consequences of this historic dislocation have become an issue in some recent land disputes.

[FIGURE 3 ABOUT HERE]

Where there is no recent history of planting of groves or swiddening there is relatively free access to mature forest for individuals of all clans, though non-Nuaulu wishing to access forest are expected to first seek relevant Nuaulu permission. In the past failure to seek permission was less problematic than it has become with a rapidly growing population, pressure on land and rising levels of extraction. Also, where Nuaulu individuals not of the clan of the historic owners are extracting – say timber – this needs to have the permission of clan chiefs. Over and above this, a user of forest needs to ensure that the ancestral spirits of the relevant clans are placated, by making the necessary offerings and invocations. Most forest near to settlements will have been

used for swiddens in the recent past and may be newly-planted (Nua. *nisi honue*), old mature gardens (Nua. *nisi monai*) or fallow forest (Nua. *nisi ahue*). Fallow forest may contain fruit trees or other trees planted as a source of exchange income. At this level, and in such areas, land is divided into *wasi* (Nua.) that are associated with individuals and households, and within a *wasi* individual gardens will be cut. The concept of *wasi* comes closest to what Sasaoka and Laumonier (2012), writing of the Manusela area of central Seram, have recently described as ‘forest lots’, though Nuauulu do not otherwise divide up the forest in this way.³ Indeed, the notion of exclusive bounded units of forest do not fit the serial rights of land that Nuauulu practice entails, in which clans, households within a clan, and individuals within a household, can all simultaneously claim rights in a particular piece of land or forest. Moreover, the long-term practicing of swiddening makes it difficult in places to know where long fallow ends and mature forest begins. For example, old settlement sites – some long abandoned – are still important reserves of fruit trees and sago palms.

Nuauulu forest has long been the focus of resource extraction for the wider exchange economy. Nuauulu have been exchanging wood, rattan, resin and other resources for exchange for many hundreds of years to acquire the valuables (textiles and porcelain) that support their ritual practices. Similarly, during the colonial period Nuauulu forest was the source of low level timber extraction. Since Indonesian independence, this has steadily increased, as have government demands on Nuauulu to

³ Sasaoka and Laumonier (2012: 6) say that most forest, 180 of 251 forest lots, consists of *kaitahu mutuani*, or clan forest.

deliver materials for government use, such as timber and rattan for police accommodation. The period 1970-80 was one of relative stability for the Nuaulu population in terms of forest extraction, compared with 1980-1998, which saw an increase in logging, in-migration, infrastructure development and conflict with surrounding groups and the government. By contrast, 1998-2002 was a time of civil disturbance and uncertainty, since which there has been an improvement in the general political situation, but continuing uncertainty and low-key tensions between the Nuaulu and other groups.

Although limited commercial timber extraction on Seram had been a feature of the economy back into colonial times, it was long seen as less profitable than the lowland forests with high numbers of Dipterocarp species found, for example, in Kalimantan (Borneo). By 1970, however, the forestry department had identified areas of 'closed forest' (Ind. *hutan tutupan*), though with poorly defined boundaries, with a view to increasing commercial extraction outside them. Such areas included as separate zones: the river Nua watershed, Latulaluala to the east towards Manusela, and Ulatepatan to the west north of Elpaputih Bay (Data: Departemen Kehutanan, Masohi 1970). By the 1980s new maps encoding better (though far from perfect) data had become available, relying on overseas consultancy, revised forest status classification (figure 3), and basic forest ecology (Ellen 2007). The engagement with the growing forestry industry from about 1980 onwards resulted in the sale of logging rights by some Nuaulu clans to small local timber companies, accusations of theft, and conflict with other Nuaulu clans (as between Rouhua and Tahena Ukuna) and non-Nuaulu as a consequence. These transactions have occurred despite local rights to forest having been

officially expropriated through HPH Hak Pengusahaan Hutan, through which the Ministry of Forestry granted timber extraction rights in concession areas for a period of 20 years. When, in 1999, Forest Law 41/199 replaced the Basic Forest Law of 1967, a new category of '*hutan adat*' (Ind.) recognizing traditional jurisdiction areas (Moniaga 2007: 280), to some extent regularized this situation. However, on maps produced by the forestry department showing the formal status and boundaries, areas historically used by forest-dwelling communities are not indicated (figure 4), in the same way that colonial and post-colonial maps do not indicate swidden areas where forest is being re-generated often in resource rich patches through long fallow (Ellen 2012a).

[FIGURE 4 ABOUT HERE]

As we have seen, Nuaulu have long been informally recognized under shared *adat* as legitimate owners of forest territories on a clan basis, and have alienated logging rights to individual companies and land to the government (for transmigration settlements). The latter involves payment of appropriate 'compensation' to the ancestral guardian spirits of the owning clan. This usually takes the form of five large porcelain plates (AM *piring batu*) and five meters of red cloth (AM *kain bering*), and a cash payment for each household within the clan (e.g. for Sounaue land at Kilo Tujuh in February 1990 this was 10,000 rupiah). By comparison, land prices for individual local purchases operate on a different scale. One hectare of land was sold to a Butonese migrant in 2003 for 1,000,000 rupiah. Purchase of logging rights can sometimes take the form of payment in kind, for example in exchange for a truck. As for prices, at Mawoti on 14 August 2003 one cubit (Ind. *kubik*) of timber commanded 450,000 rupiah for softwood and one cubit of *lengua* (AM *Pterocarpus indicus*) 2,500,000 rupiah. Five

cubits can be carried in one lorry load. Timber sold by Nuaulu is generally purchased by firms in Ambon and Masohi, where there is a sawmill.

I have demonstrated previously in some detail, and with estimates of quantities of timber required for different construction purposes, how Nuaulu subsistence levels of timber extraction might generally be regarded as sustainable (Ellen 1985: 568-77). Nuaulu practices in this regard have not appreciably altered since these data were assembled, though of course the forest around them has been heavily modified through commercial logging, the creation of transmigration zones, and a massive influx of new settlers.

Sin wesie

Nuaulu describe certain areas of forest as *sine wesie*. Sometimes, *sin wesie* are described to outsiders as *sasi*, but while the meaning of these terms to some extent overlap, the use of another more specific term to describe *sin wesie*, namely AM *sasi dusun*, is really quite misleading, as we shall see.

Sin wesie are designated by a clan chief for the provision of resources necessary for the proper performance of key stages in complex ritual cycles. They are owned at the clan level, though at any one time not all clans in a village will have one. *Sin wesie* are located in areas where no individual or household currently have or claim *wasi*. Resources in such areas cannot be harvested without the express permission of a clan chief, even sago palms that have reached fruition must be allowed to rot if restrictions are still in force. Such areas cannot be used for normal consumption. As part of the process of planning for rituals, the boundaries of a *sin wesie* will be agreed at a given

time and thereafter a prohibition enforced on the extraction of any resources from that area until such time as the prohibition is lifted. The prohibition is supported through the sanction of the clan ancestral spirits who, where a prohibition is violated, are said to seek retribution through the visiting of sickness. If a person even enters a *sine wesie* they may become ill. The prohibition is in force until such time as the resources are ready for harvesting or an important ritual has to be performed. The length of time may vary depending on how long the resources take to mature and the urgency of a ritual. As *sin wesie* are explicitly designed to ensure the availability of sufficient materials they are often established many years in advance, taking into account the maturation rates and fruiting cycles of the relevant species. Many rituals require long planning horizons, often spanning several generations, and *sin wesie* may exist for many decades before being opened for extraction. Eventually, a clan chief will lift the prohibition, the resources will be harvested and the forest reverts to its default status, until such time as a new *sin wesie* is established.

One of the main functions of a *sin wesie* is as a reserve for the growing of timber necessary to provide posts for sacred houses (Nua. *numa onate*) around which much Nuaulu ritual and exchange activity revolves, particularly timber used for the main uprights (Nua. *hini*). The construction of such houses, and also the larger village sacred houses (Nua. *suane*) are the focus of complex cycles of ritual activity stretching over many decades (Ellen 2012b). Before the *hini* have been taken it is forbidden to remove any other resources, including meat obtained in hunting. There is some evidence that such *sin wesie* will be terminated after completion of a ritual house.

In addition to timber, *sin wesie* provide a reserve for thatch and sago-leafstalk

walling (both from *Metroxylon sagu*), and for several species of rattan, required for rituals focussed on sacred houses and *suane*, as well as for sago starch, the main ingredient of feasts punctuating the ritual cycles. Sometimes there may be dedicated *sin hatane* (Nua.) that is reserves of sago for use on ritual occasions. The first time sago is used from a *sin wesie* it can only be used for *sekenae* (Nua.) the hard biscuits that feature in important celebratory feasts. Both collective pig hunts (*kasare*), the gathering of *Canarium* nuts, and sago extraction expeditions can take place in a *sin wesie* in support of ritual feasting (Ellen 2010: 129-32). As the work involved in preparation for feasts proceeds, a shelter is built in the *sin wesie* to serve as a base for processing sago required to feed the workers, and for gathering other consumables, such as meat and resin for *kamane* (Nua.) torches. During this period a *matue* (Nua., the foreman responsible for organizing work on sacred houses) sleeps at the sunrise end of the shelter to guard the sago, and the other at the sunset end, and it is he who tends the fire and cures the meat obtained while hunting.

Sin wesie, as we have seen, are organised according to clan, of which five were represented in the village of Rouhua in 2003: Sounauwe-ainakahata, Neipane-tomoien, Peinisa, Soumori and Matoke-pina. In 1996 when I conducted a census of extant *sin wesie*, Sonawe-ainakahata did not have one. There was a *sin wesie* around the headwaters of the Upa river, and again around the headwaters of the Mon river, the first belonging to Soumori and the second to Peinisa. By 2003 Sounaue-ainakahata had established a *sin wesie* at Sounukunesi, Soumori had a new *sin wesie* at Mnunu, above Isonawe, Neipane-tomoien at Wakakau, Matoke-pina at Awao. Peinisa still maintained a *sin wesie* around the headwaters of the Mon. Thus, each clan has a *sin wesie* in

different locations, and in two cases we can confirm that prohibitions had been in place for at least seven years. The locations of these *sin wesie* are shown in figure 5.

[FIGURE 5 ABOUT HERE]

Table 1 (see also Ellen 2010: 129) compares certain metrics for *sin wesie* and other kinds of terminologically-distinguished forest, including general forest (Nua. *wesie*), long fallow (Nua. *nisi ahue*), and old settlement sites (Nua. *niamonai*). The table attempts to show the aggregate ‘usefulness’ of four types of forest distinguished by Nuaulu based on plot survey data collected in 1996. The number of trees for each forest type were listed in relation to uses provided in the Nuaulu Ethnobotanical Database (NED), a cumulative index of all named plants and their uses based on data collected since 1970. For the index of species richness (S), *sin wesie* (e.g. figure 6) was found to have the highest value, followed by *niamonai*, and then *wesie* and *nisi ahue*. These data provide evidence to support the hypothesis that long-term anthropic influences increase local tree diversity. If, however, we measure mean percentage of trees listed as ‘useful’ against the total number of trees in plots of that category, and against the index of species richness, we find that recent long fallow, *nisi ahue*, provides the greatest concentration of resources in areas most influenced by humans by whatever measure. While old village sites score well when total numbers of useful species are determined, and the old Sounaue village site of Amatene was still being regularly visited for its *Durio*, *Canarium*, and *Artocarpus* in 1996, the percentage of actual trees indicated as useful is markedly the lowest of all the categories plotted. And in terms of species diversity and number of useful trees, protected sacred forest (*sin wesie*) is much like any *wesie*, which suggests that forest may not always be selected for special protection

because it has a larger concentration of resources than any other area of forest, but rather because of its physical and social accessibility for a particular clan. This is supported by the evidence for location in figure 5.

[TABLE 1 AND FIGURE 6 ABOUT HERE]

Nuauulu *sin wesie* are, therefore, areas of ritually-protected forest that are undoubtedly resource-rich and the composition of which may reflect age and successional stages of long fallow. In this respect they function in a way similar to those forest patches described by Balée and Gély (1989) and Fernandez-Gimenez (1993). However, *sin wesie* are unlike sacred groves of the kind described for other parts of the tropics that serve as sanctuaries for wildlife (e.g. Byers, Cunliffe and Hudak 2001), or for other parts of Indonesia (Wadley and Colfer 2004), or ‘sacred forest’ in the generally accepted sense of the term. These latter are generally permanent, *sine wesie*, though they may have a long life, are temporary. The upland landscape of Seram is punctuated with spaces – patches of forest, features with mythological and ancestral associations, mountains, old village sites, old cemeteries all of which are regarded as sacred and are avoided for extractive purposes (figures 2 and 3). Some of these were visited only infrequently for many years following Nuauulu relocation in concentrated settlements along the coast after 1880, mainly because they were so remote (e.g. Mawoti and Binaiya). With the opening-up of Seram since 1980, the establishment of the Manusela National Park, and more road-building, such areas have become increasingly more accessible, not only for Nuauulu themselves but for others who they see as a threat - such as loggers, transmigrants and other settlers. In such a context sacred prohibitions may have some marginal affect on limiting resource extraction,

though I have already noted how, faced with the temptation of raising significant sums of cash, Nuaulu have since 1980 granted concessions to logging companies. In such cases they have satisfied the ancestral injunction not to alienate land by insisting on involving a *monne* (Nua., *adat*) payment as compensation. They accept that such transactions may have consequences in terms of ancestral retribution that will be faced by paying fines to ancestral spirits once the signs of their displeasure are evident. I have no evidence that land subject to a current *sin wesie* has ever been disposed of in this way, but the advantage of a *sin wesie* is precisely that it is not permanent. It may be in place for 15 years – the time taken for sago palms to mature and become harvestable – or may be in place for much longer, say 50 years or more while trees mature to a height that will make them useful as *hini*. However, at some point the *sin wesie* will be opened and the land become available for general extraction and other uses.⁴

Sasi

Nuaulu do not volunteer the AM term *sasi* to describe *sin wesie*, though may use it to describe *sin wesie* in the absence of any other suitable Indonesian or Ambonese Malay word. They do, however, acknowledge a family resemblance between the two concepts, and this is reflected in the occasional use of the word.

⁴ The *seli kaitahu* temporary ban on hunting described by Sasaoka and Laumonier (2012) is in some respects similar to Nuaulu *sin wesie*, in 2003 apparently being in force for 79% of the ‘forest lots’ recognized.

A *sasi* in the more restricted sense of the term can theoretically be used in cases where the *ia onate* Matoke⁵ imposes a prohibition on the hunting and collecting of certain species, or for the gathering of fruit or vegetable products. This, however, has happened on rarely in recent decades. A *sasi* might also be organized for the coconut harvest for, say, a period of five to six months, until the fruit are dry and ready for harvesting. During this time individual owners and kin still have rights of harvest but these must be exercised with due care. Similar restrictions may be put in place for clove and nutmeg, in order to ensure that the harvest is properly mature, and so that all harvesting can occur at the same time. The decision to erect a *sasi* sign (figure 7) is made at a *saniri* (AM; Nua., *lowe*) at the formal request of the *ia onate* Matoke, but will usually have been the subject of general discussion among elders for some time previously. The sign is erected by the settlement headman (Nua. *ia onate aia*), and this indicates that it is a secular village matter, rather than principally the domain of ritual or the concern of any individual clan. When the produce is considered ready for harvesting, the *ia onate* Matoke is informed by the persons who made the original request and the *ia onate aia* calls another *lowe* where agreement is reached or not to lift the *sasi*.

[FIGURE 7 ABOUT HERE]

If fruits are taken during the period of the *sasi*, the person involved must pay the *ia onate aia* one large red plate, five meters of red cloth, five long bushknives (Ind.

⁵ The *ia onate* Matoke, head of the Matoke clan) is the *primus-inter-pares* amongst Nuaulu clan chiefs, a status usually translated into Ambonese Malay as *tuan tanah* (lord of the land).

parang). If he fails to do this he is summoned before the *saniri*, asked to account for his action, and then undertake work for the *ia onate* Matoke for a five week period (40 days). Also if the *ia onate aia* requires his work during this period he must do this also. Sometimes *sasi* are arranged between Nuaulu settlements, in which case infringement is punished by both settlements, usually by paying five meters of red cloth to each *ia onate aia*. However, *sasi* is generally never simply a matter for Nuaulu and is more often organized through Sepa, in whom sovereignty (*pertuanan*) is officially vested.

So, in the broader sense, *sasi* is not really, at the present time at least, an endogenous Nuaulu measure at all, but rather an economic device imposed by the *desa* government in Sepa to regulate harvesting of commodities between different groups within the *desa*. These groupings are ostensibly hamlets (*dusun*) but in effect may be different religious groups, as these are highly concentrated locally. Until 1980 the main villages by religious and ethnic differentiation in Sepa were as follows (figure 5): Sepa itself (Muslim); Aihisuru, Watane, Bunara, Hahualan, Rouhua (animist Nuaulu); and Hatuheno (Christian Sepa language speakers), Nuelitetu (Christian Wemale [West Seram] language speakers). Between 1980 and 1998, the composition of the *desa* became more complicated with in-migration of large numbers of Butonese from southeast Sulawesi to the area immediately bordering Sepa on the coast, and the establishment of a new government transmigration zone along the flood plain of the river Ruatan. As a result, a few entire Nuaulu clans and many individual households moved to new settlements at Kilo Sembilan (the Nuaulu part of which is known as Simalouw) and Kilo Duabelas (the Nuaulu part of which is known as Tahena Ukuna), while incoming groups of official transmigrants moved into this same zone from

Saparua, Banda, Kei, Tanimbar and elsewhere, people of mixed Christian (both Protestant and Catholic) and Muslim faith. Kilo Sembilan and Kilo Duabelas eventually fell under the jurisdiction of the *desa* of Sepa. With the outbreak of communal violence in 1998, some villages were destroyed and many (mainly Christian) refugees fled to other parts of Seram, in particular to Waraka on Elpaputih Bay and Wae Pia between Waraka and the river Nua. The picture had not substantially altered at the time of my field visits in 2003 and 2009.

How did all this impact of *sasi*? In 1990 the only *sasi* in operation in the entire domain of Sepa was a *sasi kelapa* (AM; Nua., *sasi nione*), that is a prohibition on the harvesting of coconuts for copra and on the preparation of copra. In effect, this was designed to prevent Nuauulu preparing copra during Ramadan, at a time when it is widely acknowledged that productivity of all kinds declines in Muslim villages in response to the obligation to fast. In 1996, the Sepa *sasi* was operating again for copra along the south coast within the *desa* of Sepa, from the Butonese settlement of Yainuelo in the west to the Lata river in the east, a distance of about 25 kilometers. There were exceptions, however. For example, the *sasi* did not apply at this time to the new Nuauulu settlement of Simalouw in the Ruatan transmigration zone, as many of the recent incoming migrants from elsewhere claimed not to understand it.⁶ In South Seram, in

⁶ This is the same problem that Zerner (1994b) identifies for marine *sasi* in other parts of Maluku where there are high numbers of incomers, such as Butonese from southeast Sulawesi, and this may have contributed to the general decline of the institution in some areas.

areas where incomers are scattered and in the minority they quickly adjust to local indigenous customary regulation of this kind, as has been the case in the Butonese settlement of Yainuelo founded in the 1960s, but it is undeniably a problem where there are larger numbers of migrants, especially in the official government transmigration areas where they are in the majority, and which cut across different local *desa* and *adat* jurisdictions, and which by their very character are socially and physical separated from other parts of the jurisdictions of which they are part.

The *sasi desa* in Sepa is organized by the *staf desa* (Ind.) who include the *saniri kewang* (AM), a council of *adat* officials with special responsibilities for managing the *sasi*. The council comprises a *kepala kewang* (AM, head *kewang*), one person from each *dusun* (the official local administrative units within the *desa*), and includes representatives from each Nuaulu settlement. The responsibilities include: opening and closing *sasi*, policing them, and administering punishment where there are infringements. The raja of Sepa or one of his staff will declare the *sasi* closed and erect signs along the edges of coconut groves where it is to be enforced. In the case of a *sasi* for Ramadan the prohibition on harvesting will be in force for precisely one lunar month as calculated by the religious functionaries, after which the signage will be removed and the harvesting declared once again open.

The sanctions for violating a *sasi* or *sasi pemerintah negeri* (AM) in 1996 were a combination of shaming and fining, in this respect mid-way along the temporal continuum noted by Zerner (1994a: 90-1), whereby older forms of sanction through shaming are being replaced by cash fines. If a prohibition is violated the shaming required involves the culprit circulating the village five times wearing, if a male, only

shorts, and if a female just a sarong and cloth strip over the breasts. In both cases the coarse fibre casings of coconuts are strung and hung around the body, while the culprit continuously bangs a gong or drum. The fine nowadays requires the culprit paying 5000 rupiah for each coconut (or whatever) that has been illegally harvested; also one bolt (AM *kayu*) of usually five *depa* (Ind., or meters) of *kain berang* (AM, red cloth), one bolt of *kain putih* (Ind., white cloth), and one bolt of *kain hitam* (Ind., black cloth). The red cloth represents the Nuaulu (reflecting the distinctive head scarves worn by post-pubertal males), the white cloth represents Muslims (originally from Sepa only) reflecting the white robes worn on the pilgrimage, and the black cloth represents Christians (in 1996 located in the settlements of Hatuheno and Nuelitetu), and reflecting the black clothing traditionally worn by Moluccan Protestant Christians when attending church and other ceremonies. This same colour coding is found in other ritual contexts, for example in the Nuaulu case, the final ritual in the *suane* building cycle, when the decorative ridge piece is added, and where flags are flown (red, white and black) to reflect the three religious groupings in the historic domain of Sepa. If it is between Sepa and Rouhua then 5 meters of red cloth and 5 meters of white cloth must be paid to the raja at Sepa and 5 meters of red cloth to the *ia onate aia* at Rouhua.⁷ In some cases there

⁷ Similar arrangements can be found in other *desa*. For example in April 1971 I witnessed a *sasi* for Tamilouw, an independent polity and *desa* of south Seram speaking the same language as Sepa. Tamilouw includes the largely animist village of Yalahatan. The prohibition applied to the harvesting of all fruit trees (including coconut) for the period April-July in that year.

may simply be a fine of one bolt (*kayu*) of white cloth and payment of a sum of money. Individuals may be excused a *sasi* prohibition if there is a marriage, *adat* ceremony, village work, or funeral to prepare for. People are permitted to collect fallen fruits, and outsiders are allowed to climb palms and eat the fruit.

I have described here the basic operating principles of *sasi* (*sasi pemerintah negeri*) in the Sepa domain as it applied to coconut and copra between 1990 and 1996. In recent decades this commodity has been the most frequent one subject to *sasi* in South Seram, and although *sasi* are by no means rare they have not occurred every year, but rather have been a response to particular circumstances. There are occasionally also reports of *sasi durian* (for *Durio zibenthis*). In the case of a durian *sasi* in the Nuaulu settlements the owners of each tree must, when the *sasi* is lifted, present the *ia onate aia* with 20 fruits, who then distributes two to each clan head (Nua., *ia onate ipane*). If the crop is poor then only five fruit need be given, one for each clan. This kind of redistribution is a symbolic statement of the necessity for the village to act as a collective community of producers and consumers. The 10 other durian fruits are presented to the *ia onate* Matoke clan head. There also reported cases of *sasi langsung* (AM, *Lansium domesticum*; Nua. *nasate*), *sasi atap* (AM, for thatch, usually from the sago palm *Metroxylon sagu*), and *sasi damar* (AM; Nua. *kama wae* in Nuaulu), the resin of the conifer *Agathis alba*). This last is the least common nowadays, but in the first half of the twentieth century the export of ‘Manila Copal’ was an important element in the economy of the colonial Moluccas, particularly from upland west Seram. There have been in recent years *sasi* for commercial sea produce (Ind. *hasil laut*), in particular *loga-loga* (AM, the green snail, *Turbo marmoratus*) and sea cucumber (Ind. *teripang*). These

marine commodities are far less important for all individuals and groups within the domain of Sepa, and anyway Nuaulu do not collect them.

The important thing to note here is that all of these products relate to things for sale. *Sasi* has not applied in recent decades (for which we have some record) to produce harvested for subsistence needs. During Dutch times the government put a *sasi* on hunting deer (*Cervus timorensis*) in south Seram for two years and according to Nuaulu accounts this was very effective in increasing the deer population. Indeed, when hunting resumed, Nuaulu made a present of deer carcasses to the controller in Amahai by way of gratitude. This was described to me as a *sasi* by Nuaulu, but was also regarded as exceptional in being the only instance where such a ban related to game hunting (Ellen 1978: 248, n6). More recently, Monk et al. (1997: 547) refer to a hunting *sasi* in force in the Manusela National Park.

To summarise, for Nuaulu, the term *sasi* is used to refer to: (a) any kind of time-limited prohibition on resource extraction, (b) any kind of time-limited prohibition on resource extraction sanctioned through *adat*, (c) any kind of time-limited prohibition on resource extraction sanctioned through *adat* that involves the regulation of relations between clans within the Nuaulu community, or (d) any kind of time-limited prohibition on the extraction of resources sanctioned by *adat* specifically regulating relations between different villages and groupings with a wider tradition domain or modern administrative unit (*desa*).

Wate

Matakau (Nua. *wate*) signs (figure 8) have long been remarked upon as a common feature of the central Moluccan cultural landscape, but have been little written about (Tichelman 1954). They have also often been seen as related to *sasi* as another RHT, but are really a scare charm used to protect resources or to exact punishment following theft. Though they may be used as such to support a *sasi* or a *sin wesie*, *wate* are more often used by individuals to protect personal and household gardens, while the supernatural sanctions they involve are clan-specific. Volker (1925: 294), as long ago as 1921, noted the terminological slippage and overlap between the conceptual space of *sasi* and *matakau*. For example, he reported the presence of a *matakau negeri* (AM), that is a scare charm authorised by the village head in the Christian village of Sirisore Serani on Saparua island (Volker 1925: 302), that might elsewhere have been described as a *sasi*. In 1970-71 Komisi in the Nuaulu village of Rouhua was happy to place *wate* under the general category of *sasi*, saying that they were the same but that one was for individual action and one for collective action. For the Benda-Beckmans and Brouwer (1995: 5) working on Ambon in the 1980s *matakau* was a kind of ‘private *sasi*’. But there is another difference. Whereas erecting a *sasi* sign is a warning against harvesting and theft, and a threat that any infringement will result in supernatural punishment, a *matakau* sign may be erected both as a preventative measure, and following a theft to exact retribution. More significantly, a *sasi* pertains to *dusun* (*rusun*), that is plantation land (i.e. coconut, clove or nutmeg), and a *wate* usually for individual trees (e.g. *Areca*) and gardens, rather than *dusun* land. Also, inland fishing rights are more likely to be protected by a *wate* than *sasi*.

[FIGURE 8 ABOUT HERE]

A synoptic comparison of three kinds of ritual regulation of the environment

The Nuaulu concepts of *sin wesie*, *sasi* and *wate* undoubtedly overlap, but the focal meaning of each is not the same. One respect in which they are the same is that they are all time limited in their application, in contrast to harvesting proscriptions that are continuous and absolute. These latter might include those applied to certain permanent sacred areas of forest (cemeteries, mountain tops), or those limited in application to particular categories of person, as with clan totems (Ellen 1998). While the terminological overlap indicates a conceptual family resemblance between the three institutions, they are - on balance - distinctive both socially and ecologically. A comparison of some of their distinguishing and overlapping features is shown in table 2.

[TABLE 2 ABOUT HERE]

1. *Time duration*: *Sin wesie* operate for a period of 15-50 years, *sasi* for a period of 1 month to a year, while a *wate* usually operates for the duration of the period when a resource harvestable, say two weeks to several months.
2. *Organisational focus*. Each term relates to a correspondingly higher level of social organization and each incorporates an increasingly larger population and physical area. *Wate* operate at the individual and household level, *sin wesie* at the clan level and *sasi*, mostly, at the political domain level. Historically, the latter has been more influenced by outside - governmental - forces. The level of organization in each case determines the flexibility of application. Thus, *wate* can be arranged quickly and come and go without much coordination, but they apply to quite small areas, generally about one hectare. *Sin wesie*, relating to entirely endogenous Nuaulu practices, require coordination at the clan

level and sometimes above, they generally apply to areas of forest of some tens of hectares. *Sasi*, as we have seen, often involve two or more settlements, or indeed an entire *desa*, encompassing a wide geographic area, and villages of different ethnic and religious orientations.

3. *Specificity of species focus*: *Sin wesie* are instituted with respect to all resources within a particular area, representing 60 or more species, though in practice only specific species and certain categories of resource may be extracted. *Sasi*, by comparison, are focussed on one resource species, while *wate* usually focus on either a particular resource species or a restricted space (say, all cultigens in a one-hectare swidden).

4. *Land use category*. *Sin wesie* are focussed on mature forest and semi-domesticated long fallow, *sasi* are always focussed on domesticated resources in cultivated areas (groves, clumps or individual trees), while *wate* are focussed on groveland and swiddens and domesticated resources. There are differences in the kinds of resources and biotopes to which each apply. Thus, *sin wesie* apply only to forest land, but may include long fallow, managed forest and sago swamp forest. *Sasi* are never arranged for ordinary homegardens or swiddens, or for annual root or seed crops. Protection of these is usually vested in *wate* (usually owned by a clan) but instituted by an individual.

5. *Life form focus*. *Sin wesie* involve tree crops and non-timber forest products, *sasi* focus on tree crops and marine resources and (occasionally) forest game, while *wate* focus theoretically on all owned or processed resources, including crops of all kinds in swiddens. Moreover, in the Moluccas more widely, terrestrial *sasi* relate in all cases documented not to agricultural products in the general sense but to tree products in

particular. Swidden crops – such as yams, taro, are more likely to be protected by *wate*. Thus, there is an important link between *sin wesie* and *sasi* in that both apply to tree resources. It is significant in this respect that trees are fixed in landscape for long periods of time.

6. *Status as property*. *Sin wesie* are applied to collectively owned land and forest at a clan level, *sasi* apply mainly to plantations owned by individuals, but occasionally apply to collective resources such as *kebun sosial* (Ind., gardens and plantations owned collectively by a village), while *wate* apply almost entirely to individually or household level ownership, though different types of *wate* carrying different kinds of sanction may be ‘owned’ at a clan level.

7. *Economic purpose and consumption status*. *Sin wesie* are designed entirely for ritual events and ceremonial exchange, *sasi* (nowadays) in respect of market exchange, and *wate* for both cash crops and resources required for home consumption. In *sin wesie* the resources protected are those required for the performance of ritual (including ritual exchanges) and the *sasi* required to regulate market exchanges.

8. *Management status*. *Sin wesie* boundaries are protected with spiritual sanctions, but growth within the protected area is unmanaged. Areas protected by *sasi* are subject to continual management interventions (e.g. cutting back undergrowth). *Wate* generally protect resources that are subject to a highest level of management intervention.

9. *Ecological consequences*. *Sin wesie* ensure maintenance of species richness and ecological complexity, *sasi* management strategies maintain a simplified ecology, while *wate* may either encourage diversity or specialisation. *Sasi dusun* of the kind reported for the villages of Ambon-Lease relate generally to well-maintained groves of trees (for

example clove or coconut), in which bush and extraneous matter is periodically cut back and new stock planted. In other words, from an ecological perspective they are mono-specific with a low diversity index. By comparison, *sin wesie* are protected areas but otherwise not interfered with. As a consequence, diversity is permitted to generate unhindered by management interventions.

Because of their long time duration, *sin wesie*, are inflexible, but it is this same inflexibility that makes them more effective in conserving general biodiversity and performing essential ecosystem services, even though this is not their purpose. Like the *seli kaitahu* described by Sasaoka and Laumonier (2012) for Manusela forest lots, 34 of which had been closed for more than 20 years, they function as de facto wildlife sanctuaries. Although their purpose is to ensure adequate supplies of a range of culturally useful resources, since those resources are highly diverse (Nuauulu have potential uses for over 80 percent of the tree species in the plots surveyed in 1996) and since protection of these bounded areas inevitably assures protection also for those species that are not extracted or never used, we might say that they have the effect of increasing overall bio-cultural diversity (Maffi 2001: 1-11). With *sin wesie* there can be seen to be measurable ecological benefits in protecting specific areas of forest (with consequences for ecological services), maintaining biodiversity and ensuring sustainable extraction. The first two outcomes are consequential, but the last is deliberate and planned.

By comparison, *sasi* (now in the generally accepted sense) require coordination between different villages within a polity, and therefore can apply to extensive geographical areas at any one time. However, they only refer to a specified resource and

are limited for 1 month to a year. Their ecological effect is, therefore, temporally limited, though given that they are directed at single resources, contribute to the sustainability of that resource but discourage diversity. *Sasi* are planned to regulate economic and political relations between groups not to conserve resources. However, they may have ecological benefits as they deter interventions that might disturb local ecologies, and through the equitable management of existing groves prevent extension into newly cut forest.

The role of ritual in ritual regulation

What these various arrangements have in common is that their effectiveness is sanctioned by mystical beliefs and practices, beliefs and practices that might thought to be undermined by religious change. In the Nuaulu case all three are current, functioning and consistent with the prevailing form of social control through the veneration and fear of ancestors. In other parts of the Moluccas, *matakau* (*wate*) have survived conversion to Christianity and Islam, and are part of a persisting syncretic complex of mystical beliefs (including sorcery, magic and the role of ancestors). There is some decline in *matakau* in areas where Christian churches assert their incompatibility. *Sasi* too still rely to some extent for their effectiveness on beliefs in the role of ancestral spirits and in a general reverence for *adat*, but they have in many places been successfully semi-secularized or adopted by churches, in ways that replace one kind of spiritual sanction with another. Whatever the case, there can be little doubt that their effectiveness derives from a respect for 'traditional authority' (Bloch 1974), whatever way this might be locally constituted and instantiated. Nuaulu *sin wesie* find their sole justification in

creating resource reserves for the performance of traditional (usually clan or 'house' based ritual), so when the rituals cease to be performed (as on religious conversion), and where the clans become less important because they are defined in terms of those (particularly sacred house) rituals, *sin wesie* disappear. Other beliefs about sacred areas of forest and other habitats are also subject to erosion on conversion, though conversion is not the only factor that undermines their integrity. In looking at *sasi* over recent decades in most Christian and Muslim villages we are looking at practices that are severely semantically depleted and only part of a once more extensive array of ritual regulators of environmental relations. Whatever the case, I hypothesize that the disappearance of *sin wesie* is likely to increase biodiversity loss (both alpha and beta) as the aggregate long-term restrictions on the use of certain areas decline.

Various commentators have speculated about how *sasi*-like institutions might have functioned in the context of a pre-Christian and pre-Islamic belief system (Von Benda-Beckman, von Benda-Beckman and Brouwer 1995: 4-5). In looking at the suite of mechanisms for a population that is neither Christian nor Muslim, and adhering to the complex rituals of traditional Seramese society, we can begin to make sense of the origins of *sasi*. The Nuaulu evidence suggests that it is doubtful that original *sasi* were to 'avoid the punishments of spirits and *sasi* enforcers' (Zerner 1994a: 105), but were rather pragmatic arrangements for ensuring the supply of resources necessary to maintain the functioning of ritual cycles, along the lines of Nuaulu *sin wesie*. Moreover, it is too simplistic to suggest that *sasi* are motivated by a general cosmological ethos (Ellen 1996: 625), rather they are a contingent and dynamic answer to a particular perceived short-term problem. As Sasaoka and Laumonier (2012) suggest, belief in

supernatural agencies is the key to what makes such arrangements successful, and - as Rappaport might put it - they are the highest possible cybernetic regulator. Moreover, there are certain practical advantages in having spiritual and magical forces monitoring resources rather than people: they are reliable and always available, can observe continuously, are plural and omnipresent, reliable and can enforce their will in a variety of unpleasant ways. However, although I am not aware of *sin wesie* being violated by other Nuaulu, or knowingly violated by non-Nuaulu, even animist Nuaulu are increasingly prepared to challenge the social control function of supernatural agencies by placating them through retrospective payment of compensation when things begin to go wrong.

Conclusion

It becomes clear from this account that the term *sasi* is used in several – potentially confusing – ways. This makes classifications of ‘types of’ *sasi* hazardous. This observation probably holds for the entire ethnographic area where the term *sasi* and its associated practices are found (the Moluccas), but is indubitably so for the Nuaulu on the island of Seram. To summarise, Nuaulu employ ritual to regulate their environmental relations in many ways, but there are three kinds of regulation that have a family resemblance, and which we can describe using the terms *sin wesie*, *sasi* and *wate*. In the way these terms are used there is a certain degree of overlap and flexibility, and in particular *sasi* is sometimes used in an extended way to refer to *sin wesie*.

Sin wesie are entirely controlled by clans to ensure that adequate resources are in place to service the demanding requirements of ritual cycles, particularly those involved

in constructing sacred houses. At the village level *sasi* may be arranged to regulate relations in terms of extract of common resources between clans. At the *desa* level Nuaulu villages cooperate with other village through the raja in Sepa to regulate harvesting of commodities. Finally there are *matakau* or *wate*, not analysed in detail here which are under the control of individual households and which serve to protect resources of any kind – from swiddens, groves. What this analysis has demonstrated is that it may be helpful to look at the relationship between the entire suite of institutions that operate in any one location with regard to the ritual regulation of environmental relations, rather than focussing in detail on just one. Each institution has a distinct socio-ecological impact that can have very different consequences.

In the literature on community-based conservation the name of Elinor Ostrom (1990) looms large. Interestingly, while Nuaulu *sin wesie* well exemplify the Ostromian principle that resilience of such institutions is best ensured where controlling groups are socially and culturally homogenous and composed of fewer than 3000 individuals, Sepa-level *sasi* encompass social and culturally diverse groups that even in 1996, when the most recent data used here were assembled, constituted over 10,000. In this case the resilience of a traditional *desa* administration (a strong *kerajaan*) must surely be the key. By comparison, because *wate* as a sanction is mainly under the control of individuals, its continued effectiveness depends entirely on sufficient number of the population accepting the moral codes and spiritual sanctions that underpin it. The dynamic interplay of all three provides a plausible basis for adaptive management.

At the opening of the post-colonial period, the export exchange economy of the Moluccas largely revolved around extraction of three kinds of resource: forest resources

(considered open-access and under state control), marine resources (considered open access and under local control), and plantation resources (mainly privately-owned and restricted access). While in the first, local populations were marginal players and denied access rights, with the latter two local people were not only the harvesters of material they produced, but also employed a variety of customary mechanisms to regulate sustainable production to ensure supply. Since the 1980s timber extraction and deforestation have accelerated on the larger islands of the Moluccas, including Seram. As a result, the relevance of local environmental knowledge and local mechanisms to regulate extraction has become ever more apparent. The economic changes of Indonesian *reformasi* from 1998 onwards have led to the individualisation of forest extraction, while decentralisation has provided an opportunity for local people to collaborate in natural resource management with outside non-governmental organisations

I have shown in an previous paper (Ellen 2007) how the static forest classifications produced by an earlier generation of forest ecologists and forestry experts do not always capture the local diversity and patchiness of Seramese forests, and even less adequately address its historical ecology, the role of traditional swiddening and other forms of local management in maintaining it. Moreover, I have shown how local ethnoecological knowledge provides a much more realistic basis for beginning to make sense of its dynamic character and developing a management strategy that would better allow for sustainable production and culturally and social sensitive extraction. In an era of accelerated forest extraction *sin wesie* and related *sasi* institutions provide one small

buffer against over-extraction of resources, and represent one means of ensuring the supply of materials for local people in the face of aggressive extraction elsewhere.

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Figures

Figure 1. Map of Maluku showing distribution of main *sasi* case-studies published between 1990 and 2005. The box indicates the area covered in Figure 2.

Figure 2. South Seram, showing boundaries of *Sepa desa* 2009, Nuaulu settlements mentioned in the text, old village sites, locations of 1996 plot surveys and selected toponyms and sacred places (shown in small capitals).

Figure 3. Map of central Seram showing approximate traditional territories of Nuaulu clans.

Figure 4. Map of South Seram produced by RePPPProt in 1988 indicating official land use and forest status categories. Note that while 'shifting cultivation' is indicated in the key

(L), nothing is shown on the map itself, despite a long history of swiddening by Nuaulu and other peoples in the area.

Figure 5. Map of south Seram with locations of Rouhua *sin wesie* superimposed, 2003.
Key: 1, Bunara; 2, Aihisuru (abandoned 1983); 3, Hahualan; 4, Niamonai; 5, Sepa; 6, Rouhua; 7, Tamilouw.

Figure 6. Plot survey (plot 7) of part of *sin wesie* Peinisa at Mon Sanae, February 1996 (reproduced from Ellen 2010: 132).

Figure 7. Sign erected in Nuaulu area of south Seram for Sepa *desa* copra harvesting *sasi* during July 1970, near Mon (70-9-440).

Figure 8. Scare charms (N *wate*, AM *matakau*) in operation in Nuaulu area of south Seram: (a) March 1971, near Tamilouw, for coconut grove (71-23-08), (b) May 1970, near Mon, for coconut grove (70-30-01), (c) February 1981, for clove grove (81-04-20).

Table 1. General characteristics of Nuaulu forest patch categories based on 1996 plot data (after Table 5.3, Ellen 2010: 131).

	Nuaulu description useful trees	Plots indicated	N plots	Mean S	Mean % N useful trees	Mean % S
1.	<i>wesie</i>	2, 3, 8, 9, 10	5	25 (16, 22, 27, 28, 32)	57	61
2.	<i>nisi ahue</i>	1, 4, 6	2	18 (10,20,23)	81	77
3.	<i>nia monai</i>	5, 11	2	48 (28-68)	26	66
4.	<i>sin wesie</i>	7	1	50	63	60

Table 2. Comparison of basic focal socio-ecological characteristics of *sin wesie*, *sasi* and *wate* for Nuaulu in South Seram.

	<i>Sin wesie</i>	<i>sasi</i>	<i>wate</i>
1. Operational period	15-50 years	1 month to a year	usually for duration of harvesting period: 2 weeks to several months
2. Organisational level	clan	settlement or <i>desa</i>	individual person or household
3. Resource focus	all resources in given area	one resource.	usually one resource.
4. Land use category	forest, long fallow	groves, clumps and individual trees	groveland and swiddens
5. Life form focus	trees and NTFPs	trees	trees or annual crops
6. Ownership status	collective (clan)	individual, household or village level	generally individual or household
7. Economic purpose	ritual events and ceremonial exchange	market exchange	home consumption and market exchange
8. Management status	boundaries protected with unmanaged growth	continual management interventions	generally managed
9. Ecological consequences	maintains species richness and ecological complexity	maintains simplified ecology	may either encourage diversity or specialisation