

CHAPTER 6

A Comparison of Traditional and Innovative Subsistence Strategies on Buano during Periods of Socio-environmental Stress, 1980–2003

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Introduction

Agricultural and other forms of subsistence modernization typically seek to raise productivity through strategies that assume certain conditions of ecological and social stability. Where such stability is long-term and where the process of modernization leads to increased yields, dependable income and a perceived rise in the standard of living, there is a often assumed to be a corresponding narrowing of the underlying traditional knowledge base. Knowledge that in the past ensured some kind of buffer against uncertainty is increasingly perceived as redundant in the context of modernization. However, knowledge loss of this kind can create major problems where ecological and social disruption follows a long period of stability and of measurable improvement. In contrast, where traditional knowledge is still extant or recoverable, such strategies may become an important part of how people respond to periodic shortfall in production and to natural disasters, until a degree of normality has been re-established. Alternatively, in such situations, people may actively seek new coping mechanisms, which build upon traditional knowledge and blend it with introduced knowledge in innovative ways.

This chapter examines these ideas in relation to the inhabitants of Buano, a small island in the eastern Indonesian province of Maluku, which in recent years has been subject to environmental stress, population displacement and subsistence dislocation following social and political unrest in the region. Local people have responded to these

circumstances by using a combination of traditional and new strategies. The chapter also examines the environmental consequences of rapid social and political change that these events entailed and of the local resource management strategies that have been employed. The data that I discuss arise from fieldwork conducted in the area on various occasions between 1998 and 2003.

Background

Buano is a relatively small island, located off the western end of Seram (Figure 6.1), the largest island in the eastern Indonesian province of Maluku (the Moluccas).¹ Physiographically, the island is hilly with rapid surface drainage and a very low groundwater supply. The population is distributed between two main indigenous settlements of people historically speaking an Ambon-Timor language of west Seram (Collins 1984: 94–95). Both these settlements are located on the southeastern coast of the island, while some groups of immigrant Butonese (originating from southeast Sulawesi) occupy hamlets scattered along the coast from the northwest to the southern part of the island. The two main settlements, Buano Utara and Buano Selatan, are situated very close to each other (Figure 6.2), and it is the relationship between these that I shall focus upon in this chapter. Buano Utara is the larger of the two settlements, with a population of 4,400 people in 1997. The people of this village are Muslim, have a strong sense of identity based on the retention of the local language, and appear to have retained customary practices more strongly than the people in the neighbouring settlement. Although the two settlements are of roughly equal territorial extent, Buano Selatan had a population of only some 440 people in 1997, and its people have a strong association with the Ambonese Malay language and Christianity. This pattern of retention of local languages and cultural practices in Muslim settlements and their erosion and replacement by generic Ambonese norms in Christian settlements is a widespread feature of historic patterns of change in the central Moluccas (Collins 1980, 1983).

Before the seventeenth century, what are now the two indigenous settlements of Buano formed a single community. The earliest known settlement was inland, in an elevated location, and later moved to the coast. It is likely that Islam was introduced during the sixteenth century, as the population became connected to the sultanates of north Maluku, such as Ternate. The settlement divided following the introduction of Christianity by the Dutch during the mid-seventeenth century, as reported in Dutch East India Company (VOC) documents.² Although religious affiliation led to differences in local customs, economic relations and patterns of resource extraction and management over time, the underlying plant

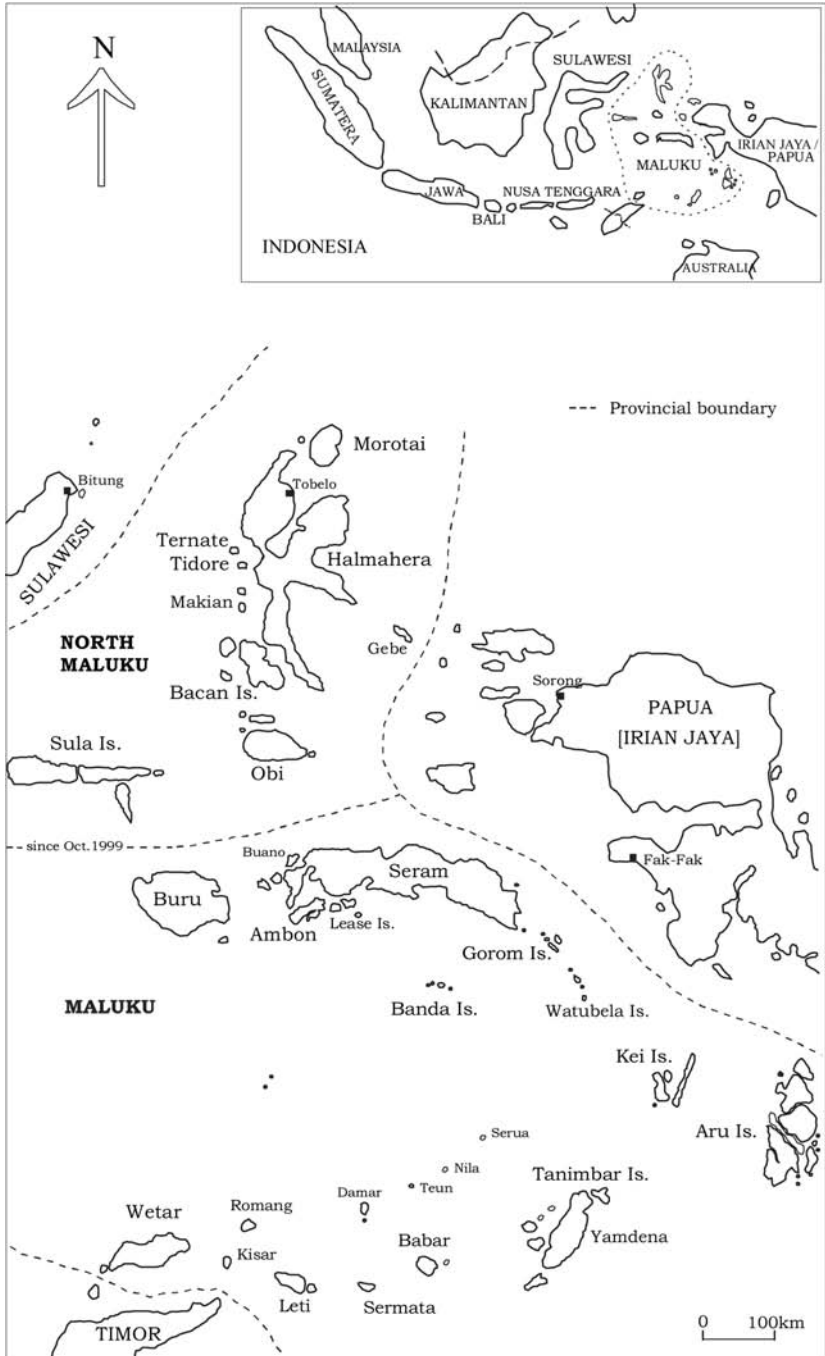


Figure 6.1. Maluku and adjacent parts of Indonesia

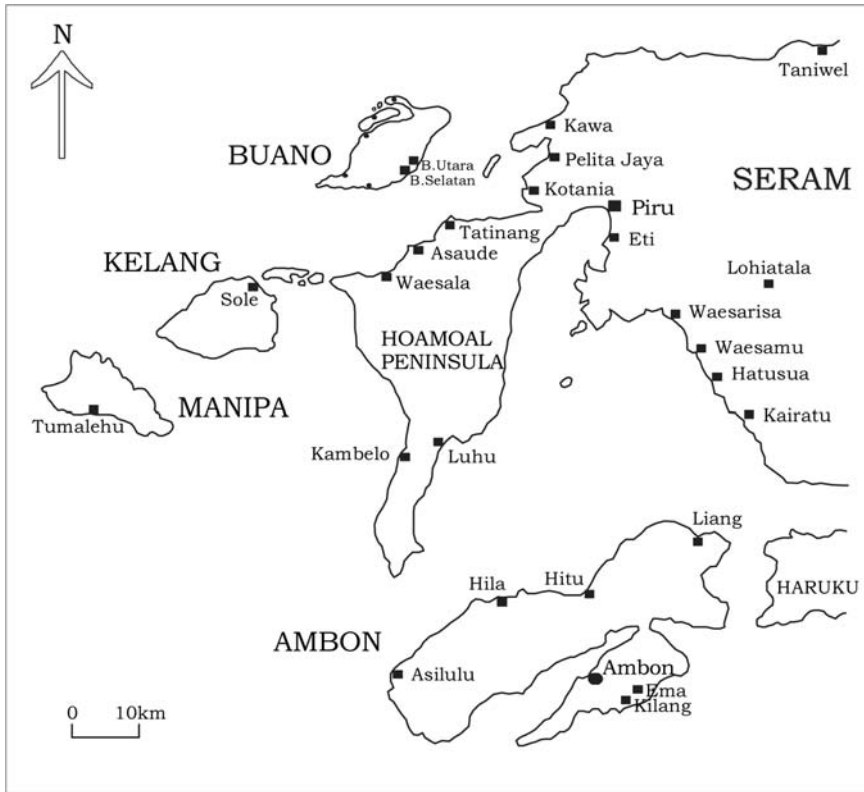


Figure 6.2. Buano, part of western Seram and Ambon Island

ecology and subsistence base of the two settlements is similar. Both rely on timber-producing forest, short-term food crops, long-term cash crops, sago (*Metroxylon sagu*) swamp, and patches of a savannah grassland in which *Imperata cylindrica* is dominant, dispersed with *Melaleuca cajuputi* trees. The staple diet of both villages is the same: sago, cassava, banana, taro and yam; and both populations engage in agriculture, forestry, carpentry, fishing and some work outside the island. Garden activity remains the main source of food for household consumption and is the principal source of income. Indeed, although the last fifty years have seen changes in the cropping patterns of Buano gardens, and the introduction of some new techniques, it would be difficult to describe any of this as 'agricultural modernization' in the sense discussed by Ellen in his Introduction to this book, or by Soemarwoto for the Kasepuhan (Chapter 3) or by Platten for Minahasa (Chapter 7).

Buano is relatively distant from administrative and economic centres, and small island communities generally raise important questions con-

cerning isolation, community capacity to reproduce effectively, both socially and economically, and also with respect to the movement of people, ideas and products, and of exchange and interdependence (see, for example, Soselisa 1995; Ellen 2003: 50–53). These characteristics underlie the importance of developing self-reliant local coping strategies for managing resources when faced with the breakdown of relations with the outside world, and for maintaining wide social networks of exchange. For example, local resource extraction in large parts of central Maluku is customarily regulated through *sasi*, a system that provides protection from the over-harvesting of certain plants and animals at certain periods (see, for example, Kissya 1993; von Benda-Beckmann, von Benda-Beckmann and Brouwer 1995). *Sasi* in Buano is applied to coconut groves and to the collection of *trepang*, sea cucumber. The inhabitants of Buano are also part of a traditional sago exchange system, in this case *maano*, in which labour is offered in exchange for a share of the harvest (see, for example, Bartels 1977; Huliselan and Norimarna 1982; Ellen 2003: 295, note 2). *Maano* may operate either between villages or within a village.

Despite its reliance on traditional local spheres of economic production and exchange, Buano has long been involved in regional and long-distance trade (see, for example, Ellen 1987, 2003). Contact with peoples from outside the Moluccas can be traced back to the sixteenth century, when the Hoamoal peninsula of west Seram (located to the east and in sight of Buano) was a major clove-producing and trading centre (see, for example, Keuning 1973; Leirissa 1973). In the process of Dutch East India Company attempts to control the area effectively, clove groves on Hoamoal were extirpated, and production was concentrated in the islands of Ambon-Lease (Ellen 1979: 66). At that time, Buano was in the Hoamoal sphere of clove production. Nowadays, Buano is less significant in terms of Moluccan clove production. Local people attribute the contemporary lack of clove groves on the island to soil and weather conditions, which they say are too dry and hot for planting cloves. However, changes in local production and exchange patterns on Buano are as likely caused by a combination of political, economic and social forces as by environmental problems alone.

For most of the twentieth century, Buano gardens have produced, for example, banana and cassava, for local and inter-island trade, as well as for home consumption. Until deforestation made this difficult, the local population also had a reputation as boatbuilders and timber workers, supplying the central Moluccas more generally. Many Buano labourers worked outside the island, as far away as Halmahera and Papua. As boat operators, from the early years of the twentieth century, Buano men sailed to many places in the Moluccas and beyond, including Nusa Tenggara and Java. Besides timber, cargoes included copra and various foodstuffs. Some of the commodities in which they traded were gathered from places other than Buano.

Pig Predation and Gardening

The interdependence and complementarities displayed in the division of ecological labour between the two main settlements of Buano is well illustrated in relation to the cultural and ecological role of pigs. When it comes to matters of garden maintenance, residents of both settlements agree that wild pigs are the most destructive predator of their short-term food crops. Control of wild pig populations is a real practical problem in the central Moluccas and the religious division between Muslims and Christians (and, in some cases, animists) means that pigs are not only a source of tension, but also a basis for cooperation. The Nuaulu in south Seram are an example of a people who are non-Muslim (Ellen 1996: 622) living in an area that is demographically predominantly Muslim. This gives the Nuaulu little competition for hunting and obtaining game. In Buano wild pigs are a serious environmental problem that is faced equally by those for whom touching or eating of pigs is forbidden on religious grounds (Muslims), and by those who have a taste for the meat of the animal (Christians). This has resulted in different control strategies used by Muslim and Christian cultivators, but also in an opportunity for effective practical cooperation between villages of different faiths. The problems associated with wild pigs on Buano were overcome through complementary arrangements between the two villages. Thus, if a pig was trapped in a garden belonging to a Muslim from Buano Utara, because it was forbidden for him to touch the pig, the owner would call a Christian in Buano Selatan to take the pig from the trap. The Christian would willingly help, of course, as he would reduce the costs of hunting and obtain valued meat.³

Wild pig have increased in numbers on Buano along with the increase in the human population, and with the opening up of more gardens over the last ten to fifteen years. The threat of wild pig damage has led to much thought and time being given to how to build good fences and set traps (noose traps, stake traps and spear traps) or use other strategies to control the animals. Some Buano Selatan farmers choose to plant particular crops that according to them are not preferred by wild pigs, such as banana. Fencing for the Christian banana gardens is not, therefore, considered necessary. As was noted above, bananas have been an important marketable product for Christians, who sell them to the more populous neighbouring Muslim village. By setting traps close to and inside gardens, the inhabitants of Buano Selatan simultaneously control pig predation and obtain meat (see Linares 1976; Dwyer 1990).

In contrast to Buano Selatan, cultivators in Buano Utara face more difficulties in dealing with wild pigs, derived from religious constraints (taboos on eating or handling the animal). They must build strong fences, more durable than those that the neighbouring Christians need to build, which leads to higher fencing costs. The high cost of fencing, in turn, encourages

them to use land more intensively, with shorter fallow periods and more permanent gardens. But, although the Muslims build stronger and more expensive fences than their Christian neighbours, Buano Utara people claim that more pigs invade their gardens than in Buano Selatan precisely because the neighbouring villagers are pig eaters. Even for a banana garden and for gardens located close to the beach and the settlement, they need to construct strong fences since wild pigs prefer all of their short-term starchy food crops. To avoid the cost of making fences, or at least to lessen the threat of pig predation, the residents of Buano Utara have chosen other strategies, including placing their gardens close to those of Buano Selatan in the hope that since there are fewer pigs in the Christian garden, their own gardens will not need expensive and strong fences (other than the bamboo structures that most Buano Selatan people have). Because of the high cost of fencing, some younger nuclear families have decided not to open new gardens at all in recent years, but to rely instead only on their parents' gardens. Besides not wanting to make fences, they are also tempted to engage in other occupations beyond agriculture, either on or outside the island. Far more Buano Utara men are engaged in timber working and boatbuilding for cash than men from Buano Selatan. They also have larger net groups for catching fish for the market, and engage in *Melaleuca* oil extraction. As a result of their involvement in non-agricultural work, especially in timber working and boatbuilding, it is likely that their impact on forest through over-extraction of timber is relatively greater.

This Buano example shows how ecological patterns (pig demography and predation on gardens, as well as human predation on pigs) are the outcome of cultural practices (the Muslim taboo on pork and the Christian preference for it). The difference in ideology, based largely on different religious affiliations, has impacted on the agricultural system. The contrasting strategies employed by Buano Selatan and Buano Utara cultivators confronted with the wild pig problem described well illustrates how the livelihoods and ecologies of the two settlements have diverged historically, even though they share essentially the same environment. It shows how different cosmological schemes are associated with different strategies, and how those strategies work out in practical relations with the environment and the neighbouring community to produce different forms of livelihood that are also closely articulated with each other and mutually reinforcing.

Ecological Uncertainty, 1980–2003

As in other parts of the Moluccas, Buano experiences two monsoonal seasons a year: the west season from November to April, when the west wind blows with interludes of northerly winds in the daytime; and the east sea-

son from May to October, when the east wind blows, with interludes of southerly winds in the daytime. During the west monsoon there is much rain in Buano, while the east monsoon is dry. Between these two seasons there is a transitional period, which occurs between April and May and between September and October. The strongest winds come from the southwest and northwest. Some plants grow best in particular seasons. For example, maize is cultivated in the wet west season and is harvested in the early east season, or cultivated in September and harvested before the end of December.

Gardening activity – the scheduling of slashing, burning and planting – depends, therefore, upon the season, and crops can fail because of unpredicted weather patterns. For as long as local people can remember, Buano has experienced drought years, the most recent of which they recall as being 1972, 1982, 1987, 1992, 1997/98, and 2002/3. Some of these drought years correspond to what has been experienced globally as the El Niño southern oscillation.⁴ These droughts – El Niño-induced or not – have caused Buano wells to almost dry up and have been linked to epidemics of waterborne disease, one of the main symptoms of which has been chronic diarrhoea. Garden plants and trees have also died due to insufficient water, and the poor cassava harvest after the long drought in 1997, in particular, disturbed the schedule of gardening activities and the food supply. It affected planning for future production and sent confusing messages about the timing of seasonal changes. Thus, in 1998 many farmers were late in clearing bush for gardens, since they thought that the dry season would continue. They did not anticipate that the subsequent rain would come so soon. Gardens had to be prepared in a hurry and the timing and conditions were not good for burning. Consequently, they were also late with their harvests. This disruption to seasonal plans was immediately followed by Christmas and New Year celebrations in Buano Selatan, and the fasting month of Ramadan and Idul Fitri in Buano Utara.

Planting at an unsuitable time can also result in harvest failure or shortfalls in yields. For example, the best time to plant rice is regarded as being around November/December. Rice planted in January/February will, it is said, be 'eaten by *laor*'. A long dry season, resulting in a delay in planting maize will also lead to infestation by *laor*. The *laor*, in this context, is a plant pest, a tiny stem borer (*mai-mai*) that eats into the inflorescence or cob.⁵ But *laor* is also a kind of sea-worm (*Eunice viridis*) harvested annually as food in many Moluccan villages. The *laor* season in the central Moluccas is around March. People notice that the times that the *laor* emerge onto the beaches and when they can be harvested in large numbers, usually correspond to periods of arboricultural and agricultural failure. For example, *kanari* (*Canarium vulgare* and *Canarium indicum*) nuts gathered at this time are usually inedible, either rotten or with no interior flesh. To explain this failure, people usually say *laor makang*, '[they have

been] eaten by *laor*'. This common local explanation is based on people's experience of the close temporal association of the two events, one in the sea and the other on the land, which suggests a connection. The scientific explanation for the appearance of these polychaete sea-worms is that this is an annual period of mass spawning stimulated by the lunar cycle, which occurs around March on the edge of certain coral reefs (see, for example, Monk, de Fretes and Reksodiharjo-Lilley 1997: 583).

The effects of changes in seasonal patterns on subsistence agricultural activity are evident to most Buano farmers. They observe that the seasons and the accompanying weather patterns have become irregular and are no longer predictable, and that this uncertainty has become especially apparent in recent years. The experience of poor harvests drives people to look for alternatives to meet their subsistence needs, which include increased reliance on traditional networks of food supply and through crop substitution.

Responses to Dry Periods

The people of Buano have several strategies they employ to counter agricultural failure during dry periods. The sago palm (*M. sagu*), upon which the people of Buano have historically relied for starch, is a robust resource, but despite a tolerance of dry land in this typically swampland palm, there is evidence that water shortage decreases the amount and quality of the starch, and, since copious amounts of water are essential to its processing, the drying up of streams may prevent its harvesting.⁶ Moreover, although sago has been the main form of starch consumed (and preferred) by the people of Buano for as long as they can remember, there are few sago swamp areas on the island today, and some of these are located far away from the settlements, and are anyway insufficient to supply the requirements of all the inhabitants, especially with population growth. So, when local starch supplies decreased following the poor harvests produced by the dry periods of the 1980s and 1990s, Buano people looked for starch supplies from outside the island to feed their increased population. The main external source of sago flour has traditionally been Seram, especially the Hoamoal peninsula.

Since Dutch times, people have gone to the Hoamoal peninsula of Seram to extract sago flour from palm stands, especially to the domains of Assaude, Tatinang and Waisala, which are located along the coast facing Buano. However, when the population of Assaude and surrounding areas increased, from the 1950s onwards, sago availability declined because of the increased number of local consumers. However, Buano is still dependent for its supply of sago flour on this area today. Usually, sago flour is transported by canoe for sale in Buano, or people go to Seram

to purchase it. One old man commented to me in 1998 that if there had been no sago in Seram, the people of Buano might have died of hunger when the long dry spell of 1997 caused severe crop failure on the island.

As supplies of sago became increasingly unreliable during the 1970s the local population turned to cassava (*Manihot esculenta*). Many cassava gardens were opened during the period from the late 1970s to the 1980s, when this crop started to predominate in Buano gardens and the starchy tuber became a regular part of local diets. This increased importance of cassava was influenced not only by the declining availability of sago locally, but also by the declining amount of sago on the regional market. The spatial extent of sago swamps and groves in certain parts of western Seram, such as around Assaude, and from where Buano traditionally obtained sago, was also in decline. In 1998, during the national economic crisis, the price of sago flour rose steeply in the subdistrict administrative centre of Piru, reflecting an inability of supply to match demand.

Despite the cultural significance of sago and its tolerance of pests such as wild pigs, cassava offered various advantages, especially during the extended dry periods. Although sago palms might require relatively little management compared with garden crops and occupied swampland and wet coastal areas not favoured by other food plants, cassava is even more flexible and able to tolerate a wider range of tropical soil conditions, including low fertility soils, while still producing a satisfactory yield (see, for example, Cock 1984; Balagopalan et al. 1988). This makes the tuber suitable for areas that have experienced soil degradation and it is a drought-tolerant crop suited to the periodic dry conditions experienced in Buano in recent years. Besides, it does not need much space to grow, being eminently suited to the size of short-term food gardens, usually around 0.25–0.5 ha, typical of the central Moluccas more generally. These reasons make cassava a dependable and secure food crop, as demonstrated during the national economic and environmental crises between 1997 and the present.

Cassava also offers advantages in terms of its flexible labour requirements. The planting and harvesting of cassava can be done by females as well as males. In contrast, extracting sago in the Moluccas is mostly men's work, although in some places women are involved in the last stage of kneading, washing and filtering the pith to extract the sago flour. Therefore, as a staple, cassava is eminently suitable for households without male members and reduces dependency on male kin. This is important to a community such as Buano, where many males are very often absent working outside the island.⁷ Local farmers consider the technique for planting cassava to be very easy since it merely involves planting cuttings taken from the woody part of the stem. The growth period of cassava is also much shorter than that of sago, making cassava harvests more frequent. The products have a dual purpose, being a source of

income as well as for household consumption. Buano Selatan farmers mostly sell their harvests to Buano Utara, which has the larger population. The cultural shift from sago to cassava can be seen by the use of one cassava product: *sagu kasbi*. As a main dish, the tuber is baked like sago, hence *sagu kasbi* (lit. 'sago from cassava', or baked cassava biscuits). In this biscuit form, it can be kept for several months as long as it is properly sun dried, replicating the properties of dried sago biscuits (*sagu lempeng*). Baked cassava biscuits are, therefore, a direct substitute for baked sago biscuits, both in form and function, and facilitate the shift from sago to cassava in certain areas. Other tubers (*Colocasia esculenta*, *Ipomaea batatas*, *Dioscorea* spp.) are not processed in this way, although, in the raw form, can be stored or kept longer than cassava. This may be one of the factors why these older local starches are still important in Moluccan diets.

Not only have Buano farmers responded to dry periods by moving from sago to cassava, they have also diversified in terms of the varieties of cassava which they grow. Both sweet (*kasbi lombo*, 'soft cassava', or *kasbi rabus*, 'boiled cassava') and bitter cassava (*kasbi gepe*, 'squeezed cassava', or *kasbi paru*, 'grated cassava') landraces are cultivated in Buano gardens. On the basis of physical appearance and the length of planting, Buano people recognize at least two types within each category. In Buano, bitter cassava is also called *kasbi obi*, on account of its attributed introduction from Obi, an island some ten nautical miles to the north. Bitter cassava can only be processed into *sagu kasbi* after detoxification by squeezing or pressing. This food-processing technology is a significant strategy for coping with dry periods and providing a market surplus. In the past, bitter cassava was not commonly cultivated in the central Moluccas.⁸ Landraces of bitter cassava also have other advantages over the more common sweet cassava types: the mature tubers are larger and the harvesting period is longer. Sweet cassava tuber flesh generally declines if the harvest is delayed. As dry periods and ecological uncertainty increase we may witness a shift in the balance of reliance on sweet and bitter cassava.

Impact of Communal Unrest on Buano, 1999–2003

In January 1999, unrest and violence broke out in Ambon, the provincial capital of Maluku province, and soon spread throughout the region. Between 1999 and 2003 thousands of people lost their lives, houses, villages and other property, including public infrastructure. The conflict was ostensibly between the Muslim and Christian communities, though the violence was in particular instances the result of a complex network of political, social, religious, economic and cultural factors at the local and national – and even international – levels, as well as at the regional level (see, for example, Brouwer and Soselisa 1999; Chauvel 1999; Lokollo 1999;

Pattiselanno 1999; Tomagola 1999, 2000; Aditjondro 2000; Bartels 2000; ICG 2002). The conflict reinforced the sectarian boundaries between Moluccan communities along religious lines, either Muslim or Christian, even though this oversimplified the pattern of loyalties and identities in particular places. Religious identity forced people to live in separate localities and to maintain strict physical boundaries that could not be traversed as easily as in the past. The institutions of law and order and customary norms and patterns of association were severely disrupted, and entire villages and their resources destroyed. The result was – in the space of just a few years – locational rearrangement and dislocation of the social and physical landscape on a scale not seen for at least 300 to 400 years.

The people of Buano were caught up directly in the conflict when a group from Buano Utara attacked the Christian village of Alang Asaude on mainland Seram on 3 December 1999 (*Media Indonesia*, 5 December 1999). Then, early on the Sunday morning of 16 January 2000, apparently motivated only by religious hostility, villagers from Buano Utara attacked Buano Selatan, destroying houses and burning the church (*Suara Maluku*, 18 January 2000). The attack caused the death of several Buano Utara people and destroyed most of the Buano Selatan settlement, except the Kampung Baru area, an extension to the village, built more recently to accommodate a growing population. The people of Buano Selatan retreated to, and defended, Kampung Baru, while others, especially women and children, hid in the gardens and the forest. The attack was brought to a halt when an army detachment arrived from Seram. After the attack, the people of Buano Selatan stayed in Kampung Baru with a detachment of army personnel guarding the settlement.

The conflict between these two neighbouring villages caused the breakdown of relationships between Buano Utara and Buano Selatan, and the prolonged conflict impacted on inter-village relationships and local strategies for subsistence management and resource use, including production and exchange networks. These two villages, which shared the same cultural origins, were now voluntarily separated on the basis of religious affiliation, and had to rapidly improvise new independent resource management practices where previously there existed complementary subsistence activities. Until January 2000 the two villages, despite sharing a similar environment, had developed different, but interdependent, livelihoods, complementary ways of utilizing and extracting environmental resources. Problems with wild pigs for the gardens and the population pressure resulted in strategic choices that show interdependent and exchange systems between them. The Buano Selatan garden harvests, for example, were in demand in the neighbouring village, while schools of fish caught using the Buano Utara large-net techniques were marketed to Buano Selatan people.

The breakdown of relationships between these two neighbouring villages led to the collapse of their integrated resource management practices. For example, wild pig invasions of Muslim gardens increased, and extended to gardens close by to the villages. When an animal was caught in a trap, there was no choice other than to pull it from the garden and throw it as far away as possible. Supplies of surplus pig meat for Buano Selatan residents were no longer possible. One Buano Utara informant said that the economic life there became harder after the breakdown of relationships between the two villages. Wild pigs roamed about and rooted up gardens, resulting in harvests so poor that there was insufficient food being produced to feed the population. Moreover, villagers could not buy produce from neighbouring Christian gardens as they had done previously and some had to buy rice from outside. Neither did Buano Utara residents receive any aid from government or other non-government organizations, because they were seen by the local government as the perpetrators and not the victims of the attack that led to communal dislocation.

In contrast, the Buano Selatan residents, who were recognized as the victims of an attack, received rice through government aid. Because of the attack on their village, they were forced to move from their original village site. They had to build new houses and leave their gardens behind, which were mostly close to the previous main settlement and close to the border with Buano Utara. Consequently, these gardens were abandoned and overrun by wild pigs, and potential income from them was lost. They also lost their major market source, especially in the neighbouring village. They had to open new gardens close to their new settlement, mostly smaller than before, to provide for everyday household consumption. However, some were producing a surplus for the market, which brought in cash in order to purchase primary foodstuffs and goods they could not produce themselves. Since they could not sell their products to Buano Utara during the conflict, Buano Selatan farmers had to develop other networks, such as those connecting themselves with Pohon Batu, a place in mainland Seram where there is a pearl factory that employs some Buano Selatan people, and where most of the workers are Christian. During the high-tension period of the conflict, the inhabitants of Buano Selatan were connected to the outside world through a speedboat service owned by the factory that carried them to Pohon Batu, and from where they were able to travel to mainland Seram to sell produce and buy necessities. Two or three times they were visited by Muslim retailers from Pulau Osi (a small island near mainland Seram facing Buano) brave enough to do trade with Christians from Buano Selatan. The Pulau Osi people brought kerosene, sugar, rice, soap and also clothing to the village in exchange for bananas and cassava. Buano Selatan Christians, isolated from the Muslims on the island during the unrest, were left with limited choices in terms of routes

out of the island or in terms of connections with the outside world they could use to augment their subsistence activities. Transportation was difficult: it was scarce, the boats had hitherto been owned by people from Buano Utara, and it was considered dangerous to use small boats (with no army or police protection) which had to pass close by Muslim areas.

The conflict led to environmental neglect and new unmanaged patterns of vegetation growth. Sago palms, for example, flowered and fruited unharvested, when it had previously been usual to fell the palm before fruiting to ensure a maximum yield of usable pith. During the conflict, residents of Buano Selatan were unable to harvest sago groves located within some parts of their traditional territory (such as in Huaroa) as these were occupied by immigrant Butonese, who were Muslim. Some groves that had been guarded by Butonese friends nevertheless went to waste as the flour could not be extracted before fruiting. Because of the tense relations between members of the villages, people from Buano Utara could not even ask sago owners to allow them to extract the palms using the traditional *maano* arrangement. Thus, polarized religious allegiances overrode long-standing customary law.

Another problem that emerged as a consequence of the conflict was that feral cattle as well as wild pigs began to predate upon garden crops. Before the conflict Buano Utara people raised many cows, none of which were penned and which were allowed to wander at will. During the conflict, some cattle owners were unable to control their livestock, and some of the animals remained and multiplied outside the settlement area, in the garden areas and in the forest causing much destruction of food crops. Indeed, some people commented that cattle were worse than pigs, as pigs at least did not eat immature maize, which for cattle is just like any other grass forage crop.

As conflict between the Muslims and Christians of Buano began to subside yet another problem emerged. This was the 2002/3 drought. At about this time residents from the two villages were beginning to rebuild their relationships. Several Buano Utara people approached residents in Buano Selatan asking to buy garden produce as they had done previously. But by this time the drought had taken hold and few gardens were yielding surpluses that could be exchanged. The drought had led to late planting, and consequently poor harvests; banana stems lacked sufficient water to be turbid and remain erect, and so drooped or broke. The combined effects of drought and civil disturbance on food production in turn affected levels of pig predation, which, according to Buano Selatan inhabitants, fell. As some villagers put it, while the cows became wild, the wild pigs become tame. The ecological shift that the conditions had brought about – from a managed environment with high densities of root crops to an unmanaged environment with more forage grasses – favoured bovines over pigs. Indeed, the people of Buano Selatan even began to bring back

to the settlement wild pigs caught in the forest, to be tamed and penned. In December 2003, there were six men raising wild pigs in the village, one of which had already produced four piglets. Prior to the conflict, Christian, Buano Selatan villagers did not raise domesticated pigs, out of respect for their Muslim neighbours and because the need for pig meat could be provided by hunting wild pig. The raising of wild pigs in the village may be seen as a short-term strategy to obtain protein, but at the same time reflects their disconnection with the sensibilities of their Muslim neighbours.

Short-term Coping Strategies Resulting from Communal Conflict

Communal conflict in Buano resulted in population displacement, the inaccessibility of land and a breakdown of local exchange relations, including particularly a collapse in the symbiotic relations established between neighbouring Muslims and Christians. The combined impact of these problems forced people back on to short-term strategies that, despite long-term disadvantages, could at least secure them a livelihood for the immediate future.

Some of these coping mechanisms were new, while others involved a reversion to, or modification of, pre-existing practices. The periodic short-fall in starch production because of the combined effects of the civil unrest and drought was overcome by government rice subsidies allocated to victims of the unrest. They had no choice in this respect as there was little indigenous starch (sago, banana, taro, sweet potato, yam or even cassava) to be had. Rice (brought from outside) became increasingly available in village kiosks, though most inhabitants saw this as a short-term strategy for the duration of the unrest. As the conflict cooled down and the rains started to reappear, so people were ready to cultivate their cassava, banana and other tubers, and some even extracted sago. Although Buano people also cultivate rice, their local rice is not one of the main starches of the island, and involves the planting of dry 'upland' landraces rather than the high-yield varieties that have constituted the bulk of recent food aid. Cassava and banana, on the other hand, are both seen as appropriate for household consumption and as a source of income.

In order to obtain cash to purchase other daily necessities or to pay school expenses during the conflict, people from Buano Selatan made use of alternative exchange networks within the region that previously had only been employed at a lower intensity. They welcomed Butonese retailers from Pulau Osi who had previously visited Buano. Others went to Piru, the subdistrict town, to sell foodstuff, such as fish, travelling in groups and paying army personnel to guard them on the trip.

Connections outside the island for daily needs were also provided by the activation of more distant kinship networks, well illustrating the point made by Bloch (1973) as to how wider kinship networks, often dormant for long periods when people can rely on normal short-term relations of production and exchange, can be adaptively crucial in long-term acute crises. The presence of Buano Selatan labourers in the pearl factory at Pohon Batu also helped to connect village people with markets outside the island.

The communal unrest in Buano had other more distant knock-on effects. Some local people fled Buano altogether, going to other places, such as Obi to the north, and then, when Obi also experienced unrest, others fled to north Sulawesi. In north Sulawesi (Minahasa) men were able to use their expertise as house builders or could engage in other occupations. Indeed, one major consequence of the unrest was a housing shortage, due to destruction and population displacement. In response to this, the government instituted a house-building programme for those displaced. A few Buano Selatan men took this opportunity to move to Piru to work as house builders in order to obtain cash. As in other cases, the incentive for this kind of short-term strategy is to obtain cash to cover heavy educational expenses, such as those connected with children who are at school in the provincial capital of Ambon.

The seeking out of new market opportunities was a widespread response to the immediate shortages created by the unrest. While some of these, such as wage labouring, could yield income within a matter of weeks or months, other strategies involved a more considered response to the long-term market situation, and investment in new knowledge and infrastructure. One such strategy chosen by Buano Selatan inhabitants was the extraction of oil (*minyak kayu putih*) from *M. cajuputi* trees for marketing outside the island.⁹ Although the process of *Melaleuca* oil distillation had been introduced to Buano around 1990 and both village domains had *Melaleuca* trees within their territories, only the people of Buano Utara had adopted this technique, and they engaged in seasonal *Melaleuca* oil production by 1994 (Figure 6.3). Buano Selatan people had previously shown no interest.

The communal conflict altered the situation dramatically. By 2003 some Buano Selatan families were already engaged in *Melaleuca* extraction,¹⁰ with eight kettles (stills) for oil distillation being operated by seven groups, some consisting of household members, others formed by persons linked through other kin ties or through friendship. There were a number of reasons for adopting a strategy that in the past had been rejected. The first was the need for cash. The local price of *Melaleuca* oil in 2003 ranged from Rp 60,000 to Rp 90,000 a kilogram, which, when compared with the sale prices of other commodities that were potentially available to them, was high. The second was the 2002/3 drought.

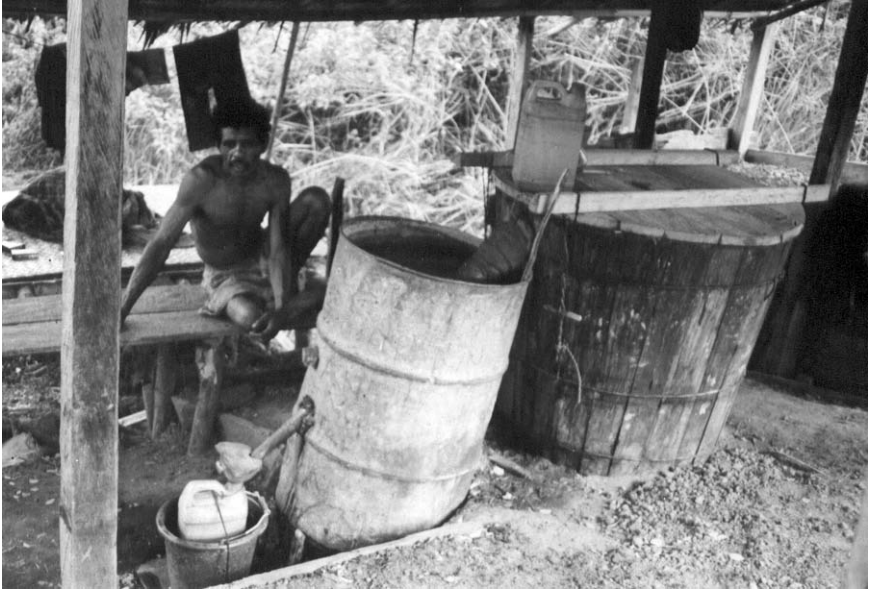


Figure 6.3. Still used in the processing of *Melaleuca* oil, Buano Utara

Melaleuca could be harvested during the dry period, the trees were not obviously damaged by short-term lack of rainfall, and the harvesting could be conducted during the period when residents were waiting for the rains to begin and open new gardens. Indeed, *Melaleuca* oil production can be undertaken twice a year without becoming unsustainable, and still provide sufficient time for gardening inputs. Thus, given the seasonal demands of other activities, it is a strategy that can be well combined with other commitments without too much competition. However, not all Buano Selatan inhabitants were able to extract oil from their own trees since not all clans or families had trees on their land, while the building of a still required capital.¹¹

By 2003 active conflict was much reduced, and members of both villages began attempts to reconstruct their pre-existing patterns of mutually beneficial economic cooperation. Indeed, some of the Buano Selatan *Melaleuca* stills were the result of joint investment between people from Buano Selatan and Buano Utara. Two Buano Utara people provided *woks* (metal pans) for oil processing and wages to pay leaf-pickers from four Buano Selatan groups. Oil production very much depends on leaf supply, and these were more plentiful on Buano Selatan trees because they had not previously been harvested for oil. The arrangement is that Buano Selatan producers pay back Buano Utara investment by supplying oil. Usually the agreement between owners of capital and the producers involves payment of half of the harvest; half the oil produced is paid for

the investment, and half goes to the producers to allow them to obtain cash for their own seasonal work.

Even though *Melaleuca* extraction may lead people to neglect their subsistence activities focused on food gardens, it is a strategy that can be justified given the situation, especially during dry periods when the garden activities are reduced. Moreover, economic cooperation that builds upon and encourages reconciliation between members of the two neighbouring villages in Buano is important in the long-term reconstruction of their integrated resource management practices.

Conclusion

For the Moluccas, with its long history of population movement, involvement in the international spice trade from an early period, transformation under Dutch colonial influence, cultural integration into the colonial state through religious conversion and uneasy incorporation into the post-independence Indonesian state, the concept of ‘traditional’ when applied to society, culture, knowledge or practice is problematic. And, although an island such as Buano is relatively isolated from the main administrative and market centres, it is inextricably dependent on a wider sphere of economic exchange (including the cash economy) and networks of cross-cutting social, cultural and religious allegiances. For these reasons, solutions to acute problems of survival posed by environmental perturbations and civil unrest are always going to consist of ‘hybridized knowledge’, a combination of the traditional and the new (see Iskandar and Ellen, this volume, Chapter 5). Rather than demonstrating how modern subsistence problems arising from socioecological stress can be solved by resorting to some aggregated body of traditional knowledge that has evolved over time to serendipitously provide for all eventualities, this chapter has highlighted the collapse of local practices and strategies as a result of socio-environmental stress. For example, population dislocation and the breakdown of old environmental management practices led to a reversion to patterns of non-anthropogenic vegetation growth, with traditionally important local staples such as the *Metroxylon sagu* going unharvested. The unrest also caused the breakdown of local community relations that underpinned a ‘traditional’ integrated resource management strategy for securing local livelihoods.

What I have tried to outline in this discussion is how local people have responded to the socio-environmental problems they faced by choosing different subsistence strategies. Population pressure and the money economy are the main factors that worsen the problems. In such problem situations, local people are generally aware that their existing traditional strategies cannot in themselves work to overcome the crisis, so they are

compelled to look for alternative strategies, whether short-term or long-term. Buano people have experienced periods where problems impacted on their subsistence activities, either in the form of seasonal uncertainty or in the form of violent unrest. Dry periods occur regularly or irregularly, but they always occur, and by these repeat experiences local people have learned to integrate cassava, and particular landraces of cassava, into their local agricultural system because these crops are more tolerant of dry soil and weather than some of their other previous sources of starch. And they know that particular cultivars, planted at the wrong time, will fail because of pest infestation. Although cassava helps them during the dry periods, they have still maintained a broadly polycultural agricultural strategy with a number of alternative starchy crops, which in their experience provides more security economically and ecologically, and more resistance to pests and disease than a mono-crop system (see, for example, Soselisa 2002), as well as supplying a more varied diet. And even though, in particular, cassava has been replacing sago, local people still obtain sago using their traditional network of exchange.

Finally, the social unrest between 1999 and 2003 caused the breakdown of existing integrated resource management practices between neighbours, practices that had developed over some hundreds of years, such as the management of wild pigs or the *maano*-sago exchange system. This situation of acute crisis required rapid decisions about appropriate short-term food-getting strategies, which included activating alternative networks of exchange. In such situations, it is often the case that markets – where available – provide for adaptive strategies that can be both quick and flexible, in contrast to long-term subsistence change. The move to the harvesting of *Melaleuca* oil is a good example of this strategy working effectively. The initiative combines the availability of a local resource, the hybridization of existing and innovative technical and ecological knowledge and outside market demand. Moreover, in this case it has also provided an opportunity to re-establish economic cooperation between two neighbouring but estranged villages. This reconciliatory move may in turn demonstrate the importance of reconnection and reconstruction of relationships between the two communities more generally.

Notes

1. Between 1945 and 2000 the Indonesian province of Maluku (the Moluccas) comprised all island groups between Sulawesi in the west, Irian Jaya (Papua) in the east, and Timor and Nusa Tenggara Timur to the south. Following administrative dislocation in 1999/2000, two separate provinces were formed: Maluku Utara (the north Moluccas) and Maluku, which now comprised Seram and its surrounding islands, Buru, Aru, Kei, Tanimbar and the south-western islands, with its capital in Ambon.

2. See VOC (Vereenigde Oost-Indische Compagnie) section of the Algemeen Rijksarchief, The Hague: letter, dated 1 February 1669 (VOC 1271, fol.171r): Sergeant Adriaan van den Pavort aan Anthony Hurdt, Manipa 1 februari 1669.
3. The same problem with wild pigs was faced by Muslim villagers on the Leihitu peninsula of Ambon Island when Christians fled the area following communal unrest. A man from Manuala beach in Kaitetu village commented that every night many wild pigs visited the Muslim villages, and even attacked people. In his theological opinion, the allowing and prohibiting of pig consumption among different people is one of God's creations for balancing the ecosystem: when people violate these rules, disaster follows (*Kompas*, 19 March 2002).
4. The El Niño southern oscillation was recorded in 1972/73, 1982/83, 1991/92 and 1997/98 (Greenpeace Niño Report 1998). In Indonesia, the 1982/83 El Niño caused drought with 340 deaths, while the 1991/92 drought caused reduction of annual income through crop loss and wage loss for Kalimantan forestry. The 1997 El Niño caused forest fires over an estimated 300,000 hectares in Sumatra, Kalimantan and Sulawesi. The toxic smog from the fires spread over 2,000 miles of southeast Asia, affecting six countries and about 70 million people (Greenpeace Niño Report 1998).
5. Some farmers try to avoid 'laor' attacks on maize by cutting the cobs as soon as flowering has occurred. Another analogical link between 'laor' of the land and *laor* of the sea is the way these organisms work to harm human subjects. Thus, it is said that someone with even a small flesh wound should be careful when they enter the sea to harvest the worms, because the worms, like the maize pest, can enter into the wound by boring, causing further damage.
6. The inadequacy of sago harvests under environmental stress is also linked to the reproductive biology and growth habit of the palm. *Metroxylon sagu* grows in clusters consisting of stipes of various degrees of maturation, but any one cluster can only provide two mature harvestable stipes or trunks every three years (Louhenapessy 1998, after Flach 1983). During the dry periods, it is possible that sago shortage is exacerbated by underproduction of the palm. The insufficiency of fresh water for processing sago pith in a palm-growing site is also a problem, as this requires either transporting the palm log in a canoe to another place that has enough water, or carrying water to the palm-growing site itself.
7. However, people usually open more than one garden, in which they plant a variety of starchy tubers in addition to cassava: yams of different species, taro, sweet potato and other cultivars. As garden site clearing or opening is done by males, households with no adult male members are usually helped by male members from their kin groups.
8. In the central Moluccas, it is the Butonese who often prefer to cultivate bitter cassava for food, and also the people of the Kei islands to the southeast, where the biscuits so made are called *embal*. In bitter cassava, high levels of the cyanogenic glycosides are distributed throughout the tuber (Onwueme 1978: 109).
9. Buano people do not know whether they produced *Melaleuca* oil in the past. However, the essential oil produced from *Melaleuca* was reported as early as 1855 on Buru and west Seram (Ellen 1997: 179, from van der Crab 1862 and Schmid 1914). Van Fraassen (1997:404) states that the Dutch controller of West Seram in his report of 1935 mentions the earlier commercial production of *Melaleuca* oil, from trees grown in the villages of Hoamoal, Manipa and Buano. However, when the price dropped, people stopped production except for

- family use. Another report from a Dutch resident in 1915 (Jobse 1997: 387) states that the oil from West Seram was sent to Ambon and from there on to the European market. As an endemic plant, it seems likely that *kayu putih* oil was produced locally for medicinal purposes before the arrival of the Dutch at the beginning of the seventeenth century.
10. The traditional method of distilling *kayu putih* oil involves a hydro-diffusion process, where the oil is dissolved in boiling water and then separated off. A large wooden kettle (pot) with a wooden lid is used as a container to boil the leaves. The kettle sits in an iron wok, set over a wood fire to boil the water. The steam from the boiling leaves is transferred through an aluminium or tin pipe, contained within another cylinder (made from wood or an old drum) and filled with cool water to serve as a condenser. The distillate then drips into a jerry can where the lighter oil separates from the heavier water through gravity.
 11. *Melaleuca savannah* is probably a result of repeated burning or deforestation on poor tropical soils (e.g. Pajmans 1976; Brinkman and Xuan 1991; Monk, de Fretes and Reksodiharjo-Lilley 1997). Therefore, the *Melaleuca* stands of Buano are likely the outcome of human clearing of original forest.

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