

11 From sago to rice

Changes in cultivation in Siberut, Indonesia

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Indonesia, a country with an agricultural population of over 55 per cent, became self-sufficient in rice only in 1984 due to deliberate government intervention. Increase in rice production has been made possible by the introduction of new high-yielding seed varieties, increased use of fertilizer and irrigation and annual expansion of the cultivation area. Because Indonesia has changed from a net rice importer into an exporter, the world market price has dropped. At present Indonesia is producing 'wetland rice', namely rice cultivated in swampy lowlands (Ali 1987), at a price higher than that of the world market.

This chapter focuses on the transition from sago to rice in the Mentawai Islands off the coast of West Sumatra – one of the areas in which rice cultivation has been expanded at the cost of both natural swamp vegetation and sago stands. This complex transition in food production touches on aspects of ecology, religion, land use, exploitation of natural resources and the division and use of labour. The production of a crop not only satisfies physical needs, but also expresses power relations and social identities, including those between persons and nature and among persons themselves. Food preferences and taboos are among the least understood sociocultural phenomena, and explanations of changes in food patterns are frequently unsatisfactory in that they fail to take account of their sociopolitical and economic contexts.

THE ISLAND

Siberut, an island of about 4,460 sq km, is part of the Mentawai Archipelago about 100 km west of Sumatra. The 1986 census recorded about 21,000 people, about 90 per cent of whom are indigenous. The non-Mentawaians belong to various ethnic groups including mainly the Minangkabau (the main inhabitants of the province of West Sumatra), and also some Batak and Javanese. A few foreigners work

in the missionary stations and the logging camps. Recently, the number of non-Mentawaians has increased rapidly.

Mentawaian culture differs markedly from that of the surrounding ethnic groups such as the Minangkabau, the Batak or the Nias. The Mentawaians are unfamiliar with pottery, weaving or metalwork and until recently with rice cultivation. Many mainland influences, such as Hinduism and Islam, have left the Mentawai Archipelago untouched. Older cultural traditions have either survived or have gone through processes of internal change (Schefold 1979: 17-22).

The population was spread over almost the entire island in small autonomous settlements (*uma*) along river banks, organized along patrilineal lines but with no political leaders. Hunting, fishing and gathering provided the bulk of daily food, fruit trees and cassava were cultivated and pigs and chickens were domesticated. Sago was the staple food.

There was no specialization in crafts and division of labour depended on sex and age. Each person developed many different skills and abilities and achieved a high degree of self-sufficiency. The patrilineal groups, also called *uma*, were economically independent, though limited barter with Sumatran traders had been going on for centuries in which products (mentioned in the preceding paragraph) were exchanged for ironware, textiles, and tobacco.

Traditionally, Siberut religion was based on a belief that all things had souls, including objects and even immaterial concepts. As human interference could disturb the souls, the religious aim was to restore equilibrium through an elaborate system of prescriptions and taboos and live in complete harmony with them. Disturbances were sometimes unavoidable in clearing the forest or killing an animal. Illness and death were also seen as a consequence of violations of relations with or among the souls. The medicine man (*sikerei*) restored harmony by performing healing ceremonies and also indicated which taboo should be observed in specific illnesses or misfortunes (Schefold 1979: 49-52). Taboos and rest periods (*punen*-periods) in which people must refrain from certain kinds of work or activities have been widely documented in 'classical' Mentawaian literature.

THE MICRO-ENVIRONMENTS

The Mentawaians divide the island's ecosystem into various productive micro-environments:

1 Settlement and homegarden, providing vegetables, bananas, medici-

- nal plants, coconuts, fruits, flowers for decoration and herbs; also the feeding ground of pigs and chickens.
- 2 Taro fields: taro, tubers, frogs, small fish.
 - 3 Sago stands: sago flour, sago grubs, pig and chicken fodder, etc.
 - 4 Newly cleared fields (*tinunggulu*): bananas, sweet potatoes, medicinal plants.
 - 5 Old fields: fruits, bamboo, wood for fuel, medicinal plants, ceremonial plants.
 - 6 Rivers and swamps: frogs, fish, shrimps, worms and water.
 - 7 Coastline and mangrove forest: shellfish, shrimps, sea turtles; durable wood for construction.
 - 8 Primary forest: game animals such as deer, wild boar; four kinds of primates; resins, various species of rattan, wood for house construction and canoe building.

Of special interest is the newly cleared field in the forest. The men start to clear the undergrowth on the selected site. Before cutting the big trees, various kinds of bananas and tubers are planted. After felling, entire trees are left to rot. Gradually, when the leaves wither, many other species are planted and a few months later, pits or seedlings of fruit trees. Between 2 and 4 years bananas and tubers can be harvested. The trees become the dominant vegetation, another site is selected and the process repeated. In the following years, the fruit trees continue to grow along with spontaneous secondary vegetation. The forest is restored although dominated by fruit trees. This Mentawaiian method of shifting cultivation is ecologically sound and sustainable and rather different from most other systems in South-east Asia. By not burning the leaves and trees and limiting field size there is almost no erosion. The topsoil is undisturbed and nutrients are released slowly because decomposition is gradual. Thus the Siberut system is a combination of hunting and gathering with agro-forestry cultivation grown with agricultural crops and animals resulting in diversified and sustainable food production and products (Wiersum 1988).

THE INTRODUCTION OF RICE

The transition from sago to rice cultivation on Siberut has a long history. In the early 1920s, the German missionary Börger believed that rice should be grown instead of sago and taro as it was more nutritious. Mentawaiian men could work in fields (he thought they were lazy) and this would relieve women from their work in the taro fields. Moreover, rice cultivation would change the traditional way of

life, characterized by long periods of taboos, and thus an ideal way to fight the 'persistent paganism'. It would also keep people in their villages. Thus, rice cultivation became a symbol of Christianity, progress and development.

After Indonesian independence, local authorities issued a decree that every young man wanting to get married should cultivate rice on a reasonably sized piece of land.

From the early 1970s onwards the development of the islands became the main government objective targeting larger coastal villages. Rice cultivation is a core feature, the production and consumption of which are indicators of the level of development and reflects local administrative performance. The main object of development is integration of all tribal groups in the mainstream of Indonesian cultural life.

The native Mentawaians currently live in various types of village. In the government-built resettlement villages rice cultivation is obligatory. In other villages, missionary influences are strong and religious teachers or 'enlightened' village heads encourage rice cultivation. Once this pressure is off, in certain villages and small *uma* settlements people revert, refusing to cultivate rice because it interferes with their preferred life style. The number of Mentawaians actually engaged in rice cultivation is difficult to assess as the situation changes from year to year and statistics are either unavailable or unreliable.

SAGO AND RICE CULTIVATION COMPARED

Sago and rice cultivation can be compared on Siberut with regard to: ecological and cultural contexts, labour use, yield, risks, nutritional value, additional products and functions, social status and the importance of the shift to rice cultivation on a long-term basis.

The ecological context

The sago palm or *Metroxylon sagu* produces far more starch than other palms. It grows to about 10–15 m, has a diameter of about 45 cm, flowers only once after 8–12 years, after which it dies. Young plants produce permanent suckers, so sago stands always contain trees of various ages. Their natural environment is fresh-water swamp where they grow in large numbers (Flach 1983). At present sago is an important food product for tribal peoples in Papua New Guinea, Indonesia and Malaysia, but other food crops (rice, maize and tubers) are heavily promoted. Early foreign observers associated sago with

traditional and 'primitive' jungle life and suggested that sago growing precluded progress.

On Siberut sago palms (along with other tree species) grow along riverbanks and in the swampy lowlands. Some of the stands are natural, others have been planted. They constitute an abundant underused crop, possibly because of the changed settlement pattern (the upper reaches of the river are no longer exploited) and, in new villages, rice is cultivated instead.

Swamp rice and sago require almost identical growing conditions. In the new villages sago stands are removed to make room for rice fields. Hill rice is unknown on the island and people are unfamiliar with irrigation techniques. However, the creation of new rice fields (unlike sago stands) does impair the wild life. Moreover, the island rainfall pattern allows only one rice harvest a year.

Cultural context

Sago and rice have different cultural meanings with regard to their status as foods and as agricultural products. Sago is the traditional staple food on the island, and its cultivation and processing are fully integrated in Mentawaiian culture. There are almost no associated taboos for its cultivation and sago processing is more like food gathering than food production. Neither are there cultural objections (taboos or religious sanctions) to rice.

As an agricultural product, however, rice cultivation is more complicated. Although rice is not subject to taboos either as a crop or in its use of land or water, its cultivation conflicts with traditional prohibitions on work during certain periods, the breach of which brings illness and death and affects people's attitude towards the environment. For example, there should be no work after house construction, hunting expeditions, constructing a new canoe or clearing a field in the forest. These taboo periods cannot be observed if rice is to be successfully cultivated, for it requires constant tending. Thus, its cultivation on Siberut entails a different religious attitude.

Labour

The processing of sago involves a number of clearly defined, gender-related activities (see Table 11.1). Sago processing is carried out by men but women assist in filling the sago containers. Small groups of men process one or two trees for each family at a time, working in the

early morning and late afternoon but never in the middle of the day. This supplies them with enough food for a few months.

The labour requirements in rice cultivation are different. Though there is no real dry season on Siberut, the best time to plant rice is in September or October when the rainfall is heaviest. There is only one harvest a year in March or April and the field is not used for other purposes or crops. During the clearing of the fields, the weeding and the harvest, there is a labour shortage in the villages. Moreover, all activities should be carried out quickly as delay results in a reduced yield: seedlings grow too tall, weeds cause problems, the grain might start to rot or be eaten by birds, pigs or mice.

Yield

Yield can be calculated according to labour input, land input and capital input. Numbers vary depending on the quality of the harvest, and differences in calculating procedures, so the following should be taken as rough indicators. Theoretically, one hectare of sago could yield about 15 tons of starch per year if all the mature palms were used. A single trunk may contain 400–600 kg of starch. As there is an over-abundance of trees, the theoretical yield is rarely reached. Rice harvests are always maximal in the sense that people will do their utmost to harvest the entire crop. But rice yields vary due to disease and irregular rainfall. A relatively good harvest may yield about 1,500 kg/ha. One hour invested in the preparation of sago starch may yield about 2.6 kg. The nature and intensity of work are not measured in this calculation. For rice the yield is about 0.6 kg for each hour in a harvest of 1,500 kg/ha. Based on comparable calculations, sago has often been classified as a 'lazy man's food'. Apart from land and labour there are no further inputs. All tools are homemade and relatively cheap and simple. Fertilizer and pesticides are not used in rice cultivation.

Risks, diseases and pests

The sago palms are part of the natural vegetation. Locally available minerals and the quality of the soil and the water determine its growth, quality and starch content. Men simply harvest the crop. The hard bark prevents animals such as wild boars and deer from reaching the starch. Sago does not suffer from diseases or pests and the risks in keeping sago flour for future consumption are limited. The flour is

kept under water in cylindrical containers made out of palm leaves that keep out mice, rats and birds.

Rice, however, is susceptible to plant diseases, irregular rainfall and plagues of mice, rats, deer or wild hog. In addition there are storage problems in the humid climate, especially in storing seed for the following year. It is difficult to calculate exactly how much of the potential harvest is lost, but clearly, additional labour is needed to avoid these risks.

Nutritional value

The idea that rice is a better food product than sago is widely believed. Analyses of nutritional values indicate a higher content of protein and fat in rice. Platt's (1977) table compares the food value of 100 g of raw sago starch with rice. Table 11.2 (based on Whitten 1985 and Platt 1977) shows the food value of sago from Siberut. The differences in value are partly attributed to the variations in moisture in Whitten's sample. What is most important, however, is the higher percentage of protein in rice.

As sago is almost pure starch it is thought to be an inferior food. However, this is not the decisive factor as it is the total composition of the diet that counts, or the quality and quantity of complementary foods. Thus, sago is a different dietary component compared to rice. Rice tastes better and is quicker to prepare so all meals contain a substantial proportion. Sago meals are served with a greater proportion of additional foodstuffs as fish, meat or vegetables and time to collect these other items is available. From an analysis of several hundred meals it became obvious that rice meals generally lack these complementary dishes, and that sago meals are more nutritious. This is the only meaningful basis of nutritional comparison.

Secondary products and functions

Apart from flour, the sago palm provides a number of other products. Harvesting sago grubs is probably one of the most efficient ways of obtaining animal protein on Siberut. The sago beetle lays its eggs at the top of the felled trunk and after a few weeks fat white larvae can be picked. Sometimes complete trees are left to the beetles by splitting the bark at various places. Cultivation of grubs is prodigious and can yield 12 kg per tree, representing about 10 hours of work (675 calories per 100 g) (Whitten 1985). Leaves of the sago palm are used for roofing and cooking, the bark is used for wall and floor construction and leaf

Table 11.1 Comparison between sago and rice on the island of Siberut

	<i>Sago</i>	<i>Rice</i>
Origin	original vegetation self-regenerating plants	needs to be planted yearly (1 harvest a year)
Habitat	natural vegetation in swamps and along river banks	cultural landscape (in swampy areas)
Ecological infrastructure	continuity in vegetation structure: no artificial obstacle for animals (no mono-crop)	discontinuity in vegetation structure: artificial obstacles for certain kinds of animals, favourable for others
Cultural adaptation		
(a) as a food product	traditional staple food	new but acceptable food product
(b) as a crop	integrated part of the culture (no specific restrictions)	incompatible with traditional life style (use of labour) but no direct religious taboo connected with land use
Yield:		
per ha	ca. 15.000 kg per ha per year	200–1.500 kg per ha per year (1 harvest)
per hour	2.6 kg per hour	0.6 kg per hour
per unit of capital input	no additional investment	besides seeds no additional investment (no fertilizer or pesticides)
Use of labour	no peaks	several peaks in one season (cleaning the field, planting, weeding, harvesting)
Workforce	only men	mainly women
Risks	none	plagues diseases protection of supply

Secondary products	sago grubs material for thatching baskets walls/floors	none
Secondary functions	animal food (for pigs and chickens) exchange product in traditional relations: payments of fines and brideprices	none
Nutritional value per 100 g	water(ml) : 12° (38.8) ^x calories : 352° (265) ^x protein(g) : 0.5° (1.44) ^x carbohydrate(g) : 88° (57.8) ^x fat(g) : -° (0.48) ^x	water(ml) : 12° calories : 352° protein(g) : 7.0° carbohydrate(g) : 80° fat(g) : 0.5°
Part of menu	limited part of menu	main component
Ascribed status	symbol of traditional life style and primitivity	symbol of progress and modernization but also of external influence
Long-term perspective	no commercial value limited possibilities for mechanized processing permanent use for self-sufficiency additional products and functions will remain important	no commercial value limited possibilities for mechanization in the future less important as a crop because labour requirements: it will become import item

Notes: ° Platt 1977;
^x Whitten 1985.

Table 11.2 Nutritional value per 100 g of sago and rice

<i>Sago</i>	<i>Platt</i>	<i>Whitten</i>	<i>Rice</i>	<i>Platt</i>
water (ml)	12	(38.8)	water	12
calories	352	(256)	calories	352
protein (g)	0.5	(1.44)	protein (g)	7.0
carbohydrate (g)	88	(57.8)	carbohydrate (g)	80
fat (g)	–	(0.48)	fat (g)	0.5

Source: Platt (1977); Whitten (1985).

fronds provide good material for making baskets and hats. In comparison, rice has only one secondary product – the leftovers after threshing that could provide animal feed but the quantities are too small to be very useful.

Sago groves also fulfil certain other functions. They are important elements in brideprice along with other tree species, animals and products. They are also part of the payment of fines imposed on criminals or people who have been offensive. They are essential in the system of village justice. Sago groves are also ideal places for raising pigs and chickens. Again in comparison rice has no secondary functions. Rice fields are never included in the payment of brideprice or fines. Particularly at harvest time, there are often quarrels between owners of rice fields and owners of chickens, ducks or pigs which may cause damage to the rice. People are obliged to confine the animals, which implies additional work in providing animal feed instead of allowing them to forage freely.

Social status

The national food in Indonesia is rice. Besides being a staple food, it also fulfils important ceremonial or ritual functions on Java, Bali and various other islands. It is a symbol of fertility and welfare and important in sacrifices and ritual exchange. Filled rice barns are a symbol of wealth. Rice cultivation and consumption are preconditions of 'civilization'. People who do not (yet) eat rice are considered inferior, poor or uncivilized (Soemarwoto 1985: 208–10). Thus, it is hardly surprising that the introduction of rice is encouraged. Arguments with regard to the labour costs and the ecological consequences and losses incurred by this innovation are insignificant in this line of reasoning. Because of its ascribed superior status to sago and taro,

rice represents a cultural value which cannot be reduced to economic, ecological or agricultural arguments and has partly gained ground among the Mentawaians, in that rice becomes part of a new complex of 'progressive' cultural elements. Rice offers a possibility of escaping a label of inferiority along with zinc roofs, modern education, Islam, modern clothing and the possession of radios, watches or outboard motors; it is necessary for those who want to break away from tradition. For those who wish to retain the traditional life style, it remains an incompatible element of foreign influence.

The long term

As the population is limited and the sago stands abundant, sago could easily remain a food product in the subsistence economy as its cultivation is a sustainable mode of exploitation of the natural resources. Rice was introduced on Siberut to 'raise' the population from its existing human condition under pressure from government and outsiders. Should this tendency to abandon traditional values continue, another phenomenon may appear – the increasing commercialization of the agricultural system in which other crops may become more profitable than rice. No sooner would rice eating become incorporated into society and in the market economy, then rice might lose its significance as an agricultural product as the annual labour demand becomes too heavy a burden for the farmer. They might start looking for alternatives like copra, cloves or coffee. The increasing importance of these monocultures would require more and more land with serious ecological consequences for the erosion-prone hills. Traditional varied food resources would be neglected. While some men would start to work in the logging camps, others would try to become crew members on the small trading vessels or turn to commercial fishing. People would also intensify the exploitation of rattan resulting in complete depletion of the species with commercial value. Once used to rice as a staple food, and if assured of a cash income, they would prefer to buy rice instead of cultivating it themselves, with other crops offering better returns and requiring less labour input. Moreover, arable land is not a limiting factor on Siberut. Labour is the problem. So the Mentawaians optimize their labour and not land as do the farmers on Java for instance.

The introduction of rice has led to an undesirable effect. Instead of becoming a rice-exporting island, it has through the monetization and commercialization of land and agricultural labour become a rice-importing area and will increasingly remain so. As a result, the island,

traditionally covered by tropical rain forest containing a large number of endemic species of plants and animals, will lose its natural value as logging operations and cash-crop production do not allow for the continued survival of its rich natural heritage.

THE LOCAL POPULATION

All analytical criteria and aforementioned arguments are aspects of sago and rice which can be analysed and evaluated by outsiders, both planners and scientists. They attach different values to the criteria which serve as the background for their policies and recommendations. At present the authorities still favour an increase in rice production both through intensification and extending the cultivation area. The local population is also involved in the process, weighing one argument against the other. Sometimes fear of the outside world prevails, but sometimes a positive choice in a situation of relative freedom can be decisive.

A surprising item in the comparison between both products as conceived by the local population are the prices of sago and rice in the small local market. Sago costs about Rp 2,500 per *tapri* (container) which equals 50–60 kg rice requiring about 4 to 4.5 times as much labour as sago (see Table 11.1), thus the labour investment in rice is also expressed in the local price. Rice is an expensive or luxury food. The difference in nutritional value between both products and the indirect consequences for the composition of their diet are barely known to the people.

The burden of producing for consumption, in particular that of women, is accepted by various groups because the men are seen to be more occupied with wage labour or the cultivation of cash crops. It is the price paid in the name of progress (*kemajuan*). I believe that the burden is only temporary until rice can be eaten without having to produce it oneself. Other groups act out of fear of the local authorities, the result of perceived power relations and future expectations; their choice between sago or rice is not based on their appraisal of the characteristics of both products, but on the power relations that have particularly determined the history of rice production on Siberut.

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