

DEVELOPMENT, SUSTAINABILITY, AND THE DEFORESTATION OF SAMOA

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The forests of Samoa (formerly Western Samoa) are rapidly disappearing. This article reviews the history of Samoan deforestation, particularly during the last four decades, in the context of ideas about development and sustainability. It also examines the role of village agriculturalists in the process of deforestation. Recent economic, technological, and organizational changes have increased village agricultural expansion and, consequently, deforestation.

MORE THAN TWENTY-FIVE YEARS AGO, as the world was becoming aware of the planet's vanishing resources, *Natural History* published an article on the demise of the rainforests of Samoa and the role of an American lumber company—the Potlatch Corporation—in harvesting the hardwood stands of its islands (Shankman 1975). The article was critical of the corporation, and Potlatch was given the opportunity to respond. A corporate vice president assured readers of *Natural History* that conservation of forests was an important concern and that Samoans themselves were ultimately responsible for developing the resources of their country.

At that time not much was known about rainforests or multinationals. Anthropologists did not usually study these things. Concepts like “sustainability” and “the global economy” were still in their infancy. In the last two decades there has been much conceptual and theoretical progress as well as a great deal of actual research on tropical rainforests. But what has happened to the forests of Samoa?¹ Have they been developed in ways that have helped the Samoan people? Have they been a sustainable resource? Did Samoans become effective forest resource managers as the Potlatch vice president

anticipated? Or, has sustainability been a chimera and the forests a vanishing resource?

The answers to these questions, it turns out, are rather straightforward. The Potlatch saga was a compelling story, but it was short-lived. Potlatch left Samoa in 1976, and multinational lumbering did not play a major role in deforestation thereafter. Instead, the clearing of the forest has been due primarily to the rapid expansion of village agriculture. A good deal of documentation by both government and academic researchers suggests that in the near future there will be very little coastal and lowland rainforest left.² Only the higher-altitude and relatively inaccessible mountain rainforest and cloud forest may remain, largely because they are of little commercial value. Despite some noteworthy efforts at conservation and some isolated successes, at the present rate of exploitation, deforestation is a major feature of the Samoan landscape.

A recent report on Samoa by the Food and Agriculture Organization of the United Nations states that "if the present rate of depletion continues, the forest resources will be exhausted shortly after the year 2000" (1993:1). Geographer Gerard R. Ward, an experienced observer of forest trends in Samoa, notes:

Between the mid-1950's and the late 1980's the proportion of the total land area of Western Samoa which was under forest cover declined from 74 to 55 percent. While the resident rural population increased by 54 percent between 1956 and 1986, the area cleared of forest (excluding lava flows) increased by 73 percent over approximately the same period. Since the late 1980's, the rate of forest clearance is reported to be equivalent to the removal of almost 2 percent of the 1987 forest area per annum, with 80 percent of the clearing being the result of agriculture and other non-forestry activities. This is similar to the estimated rate at which the world's tropical forests generally are being cleared and, according to one Western Samoa Forestry Division estimate, triple that occurring in Indonesia. (1995:73-74)

In another cross-national comparison, the World Bank finds that Samoa has one of the most rapid rates of deforestation in the world (1996:86).

How did the large-scale deforestation of Samoa occur? This article reviews the history of deforestation, particularly during the last four decades, in the context of ideas about development and sustainability. These ideas have been the nominal bases of government policies that were to guide forest use over these decades. But such ideas may be less important than economic,

technological, and organizational changes at the village level, including changes in the Samoan land-tenure system, that have played a significant role in how the Samoans actually use the forest. I will also discuss how the international drama between a large multinational lumber corporation and a tiny independent country in the 1960s and 1970s gave way to a less riveting but more devastating process that illustrates the tragedy of the commons at the local level. Wider forces have had an impact on small-scale Samoan planters who, in turn, have responded by privatizing commonly held land and expanding village agriculture. Agricultural expansion is now the primary contributor to the deforestation of the islands. But before discussing these trends, some ecological and historical background may be useful.³

Forests in Pre-European Samoa

The forest species of eastern Polynesia are related to species from southeast Asia. Although the island forests appear lush and primeval like their continental antecedents, the evolution of these island forests has taken place largely in isolation, so Samoa's forests have fewer species than rainforests on the Asian continent. The Polynesians added to these fragile ecosystems, bringing with them significant "transported landscapes" of domesticated plants and animals (Kirch 1989), and thereby modifying the natural environment of the islands.

Pre-European Samoa was a society of dispersed villages surrounded by forest. Although there were larger political units, the village was the fundamental unit; political consolidation did not result in large centralized places. At the time of contact, Samoa's forests were largely intact, according to European observers (Olson 1997), unlike ancient Hawai'i, where large tracts of forest had been cut and burned for agriculture.

In Samoa, forest land was typically under village control, and new agricultural land was its most important contribution to human settlement. Agricultural land was cleared close to each village, and forests also provided timber for houses, fuel, and canoes. Wild plants were gathered for subsistence and medical purposes, and there was hunting of wild pigs and pigeons. Traditionally, Samoans spoke proudly of their particular forest holdings as having the best forest, the tallest trees, the most beautiful stands, or the best wood for house construction. Living immediately adjacent to the forest, villagers had a good working knowledge of forest species and their uses (Cameron 1962).

The exploitation of the forest was influenced in the pre-European era by Samoan cosmology. There were sacred places in the islands, including sacred groves, with *taulāitu*, or "priests," regulating their use. Samoans would not

cut these areas. European missionaries, determined to rid Samoa of superstition, cut trees to show Samoans that no harm would come to them. Olson cites a nineteenth-century Wesleyan missionary who came across a grove of commercially valuable timber that villagers refused to log because it was sacred, even though they were nominally Christian (1997:20–21). The missionary then cut down one of the trees to demonstrate to the villagers that there would be no supernatural sanction; the villagers followed suit. In this way, religious impediments to utilitarian use were overcome. Olson believes:

Pre-European-influenced Samoan societies effected maintenance of biological resources partially through cultural incorporation of a spirit world integrated in forest and sea. The potential conservation effect of Samoan spirit-nature relations diminished with Samoan adoption of Christianity. This is not to imply that pre-European-influenced Samoan cultural practices reflect a conservation ethic or intent. Rather, in the absence of associated spiritual constraints of pre-Christian religious ideology, Samoan cultural practices, past and present, suggest a more utilitarian than conservation or preservation basis. The difference refers to the degree of direct, consumptive use and sustainability between resources, as opposed to values and practices promoting the maintenance and protection of specific natural resource flows and ecological processes. In this sense, the current pattern of nature transformation in Samoa, the decline of active forests and living coral reefs, appears as an extension of material-economic practices devoid of the more symbolic-religious aspects of Samoan relations to forests and sea before the introduction of Samoa to Euro-American-Judeo-Christian constructions of nature. (1997:9)

In addition, the limited size of Samoa's population, the dispersed village settlement pattern, and the nature of indigenous shifting cultivation in pre-European times also played important roles in constraining the exploitation of forests.

Samoa's Economy from the Mid-Nineteenth to the Mid-Twentieth Centuries

In the nineteenth century, the islands of Samoa were viewed as a potential agricultural prize by rival European powers. By the mid-nineteenth century, large tracts of lowland forest on Upolu had been cut and replaced by foreign-owned cotton and coconut plantations. And before the century's

end, a visitor to Robert Louis Stevenson's home at Vailima warned Samoans to conserve their forests or lose them to foreign interests. But this warning was premature. Land alienation in the late nineteenth century and the first half of the twentieth century lessened, and the expansion of European plantations did not truly threaten the forests. At the same time, Samoans incorporated export crops into their own plantations, and village agriculture expanded accordingly. The islands' economic future seemed bright by the mid-twentieth century, although fluctuations in export prices, weather, and crop diseases were impediments to economic growth and although there had been a gradual overall economic decline until World War II.

After World War II, Samoa embarked on the road to political independence, which was realized in 1962. Apart from political sovereignty, though, there was the issue of economic vulnerability. Without a solid economic base, political independence would not mean much, and economic development would be problematic. As anthropologist W. E. H. Stanner bluntly commented in 1953, Samoa was in an economic category so "backward" that the problem was not simply encouraging development, but rather nurturing the very "preconditions" for development (1953:409). This sober assessment was disregarded, and the rhetoric of economic development was embraced.

During the late 1950s and the early 1960s, the seriousness of Samoa's economic situation was still a matter of debate. As New Zealand's colonial responsibility until 1962, the islands did not have to face problems of economic vulnerability directly, and there were experts who felt that better times lay ahead. The situation was not acute, as it rarely is in countries living under conditions of what used to be called "tropical affluence" (Fisk 1962). In such countries, underdevelopment does not entail the kind of poverty that is found in areas with severe land shortages, chronic food shortages, or high infant mortality rates and short life spans. In each of these respects Samoa was relatively well-off. The slow economic decline that had occurred over the first half of the twentieth century was not regarded with alarm because its effects were not catastrophic. Hope was nourished because reversals are possible in such economies, and since there was agricultural growth in the 1950s, continuing growth was expected.

Still, there were pessimists—those experts, both Samoan and foreign, who expected a change for the worse. They predicted that the conditions that had led to the long-term decline in the early twentieth century were likely to continue and that the expansion of the 1950s would be short-term. One prophetic analysis warned that a "combination of unfortunate circumstances in weather, plant diseases, pests, and poor world market prices for two or even three of the major crops would result in a financial crisis for the Western Samoan nation" (Gerakas 1964:32). But the optimists were not

deterred, especially in the popular press. In 1964 "Boom Is on the Way" headlined an article in the *Pacific Islands Monthly*. The same caption appeared in an editorial in *Samoana*, a Samoan newspaper, on 26 January 1966. The opinion was offered that things were not as bad as they seemed: "In fact, indications are that this country is on the verge of a boom that in five or six years could transform its economy from that of subsistence to one of the most flourishing in the South Pacific." The following week Western Samoa was devastated by the worst tropical storm in the South Pacific in seventy-five years.

The storm underscored the vulnerability of the economy in a manner that left few illusions. In the next five years (1966–1971), Samoa was to be visited by all the woes prophesied. Tropical storms struck in 1966 and again in 1968. The important banana industry, already decimated by bunchy-top virus, was virtually eliminated. The storms also curtailed production of the other two major export crops, copra and cocoa. When copra exports made a dramatic rebound in 1971, slumping world market prices reduced the value per ton to less than two-thirds of what it had been the previous year. Trade deficits persisted over the next twenty-five-year period, and balance-of-payments problems at the national level were common. Major exports such as copra and cocoa declined in value. And the devastating tropical cyclones of 1990 and 1991 further exacerbated the island's economic problems as well as destroying substantial areas of the forest.

Economic Development, Forests, and Potlatch

As events were underscoring the seriousness of the economic situation, plans were being laid to develop the economy. In 1961, just before Samoa's political independence, a Committee on Economic Development was formed, and in 1964 a Development Secretariat superseded the committee. Much of the support for the secretariat (known since 1965 as the Department of Economic Development) came from the United Nations Development Program, which had its regional headquarters for the South Pacific in Samoa. With the United Nations staffing the highest positions in the secretariat, this advisory group set about surveying the islands' resources, determining planning priorities, producing a five-year development program, and promoting the idea of development among Samoans.

Following the completion of its surveys, the development group decided to emphasize improving conditions in the deteriorating village agricultural sector. Less emphasis was given to fisheries, tourism, and forestry. The reasons that forestry was given secondary attention can be found in an independent study by geographer Stewart Cameron, which reported that local

demand alone would put severe pressure on the rapidly diminishing lumber supply. Cameron found that "Western Samoa today possesses inherently poor forest resources which, unless rapid and coordinated preventative and remedial measures are taken, could disappear within two generations because of the ever-increasing demand for timber and cropland" (1962:77). This study concluded that large-scale milling and logging operations would be "impossible" (*ibid.*:66).

Cameron's study was especially important because it was part of a group of detailed studies designed to influence the newly independent country's policies toward land, resources, and agriculture (Fox and Cumberland 1962). Cameron stressed that, despite appearances, Samoa's forests were not abundant and would not be sustainable without immediate coordinated efforts to integrate village agriculture with forest conservation. Most significant, Cameron noted that village agriculture was the largest consumer of forest land. He hypothesized: "If the present haphazard expansion of land for agriculture continues, even allowing for renewed use, with fertilizers, and some land now in enforced fallow, in twenty years' time, with a projected population of 200,000, the major portion of the forest would cease to exist as a timber resource" (Cameron 1962:74-75). This analysis would prove remarkably accurate.

A separate study carried out under U.N. auspices in 1963 came to the same general conclusions about planning priorities, except that large-scale, commercial sustained-yield tree farming of tropical hardwoods was viewed as a feasible, though secondary, development possibility.⁴ It is this study that Potlatch cited as the basis of its efforts to help Samoa "launch itself into the mainstream of economic development" (Potlatch Forests 1971:3).⁵

Although the welcoming of private foreign capital had occurred much earlier, Potlatch would become the largest corporation ever to invest in Samoa. The 1963 U.N. study had recommended that Samoa take additional steps to secure outside capital. Yet this new policy contrasted with past policy and the wishes of many Samoans who were wary of European economic control. For example, in 1947, when Samoa was still under New Zealand mandate, a foreign furniture company was given permission to use Samoan timber resources. However, fearing that this case might set a precedent for further outside investment, Samoan opposition became so intense that the firm withdrew. The same cautious approach continued through the 1950s and 1960s and, in 1966, was extended to the negotiation of the Potlatch contract.

Local customary ownership prevented the government from granting timber concessions directly. But without the ability to lease necessary land, foreign investment could not be secure. Well before Potlatch, the Samoan government modified the law to allow limited leasing for commercial, indus-

trial, and tourist purposes. While this modification did encourage some foreign investors, it was not sufficient for Potlatch. By early estimates, Potlatch wished to lease between 100,000 and 160,000 acres of land on the island of Savai'i, or between 14 and 23 percent of Western Samoa's total land area (*Pacific Islands Monthly*, December 1968).⁶ For a transaction of this magnitude, the corporation found it necessary to request special leasing provisions that would circumvent restrictions inherent in the Samoan land-tenure system.

The roots of this system are traditional but were reinforced in the colonial era. After large parcels of land were alienated to European plantation owners in the mid-nineteenth century, Samoans became more aware of the need to control their land. In 1921, while under New Zealand mandate, Samoa's quasi-traditional system of land tenure was applied to 80 percent of the islands' land. Under this system, corporate family units in each village control multiple plots of land that are acquired through use. Land is jointly held by a corporate kin group, including family members in other villages who have a potential voice in land use even though they do not reside on it. Actual decisions about use lie with an elected family head, or titleholder, who, in consultation with family members and other titleholders in the village council, manage land use.⁷ If conflicts over land within families, between families, or between villages cannot be resolved, they can be referred to the national Land and Titles Court, an institution set up to handle just such disputes.

As long as land was abundant and was not a commodity, this system of communal land tenure was viable. It supported the Samoans adequately, and in the process, mastery of its labyrinthian complexities encouraged political astuteness among Samoan titleholders. As land became scarce, however, and as more commercial land-use alternatives were foreseen, the traditional system came to be regarded by economic planners as a barrier to economic development.

Potlatch ultimately wanted to invest US\$6 million in a timber processing plant, harbor facilities, and lease rights to Samoan forests. Commercial leasing and customary land-tenure arrangements were modified by an act of Parliament, which approved the Potlatch proposal in 1967 and paved the way for commercial leasing of timber rights. Potlatch began its operations in earnest in the early 1970s, but there were problems (see Shankman 1975, 1978), particularly unexpected expenses such as the dredging of the harbor at Asau for shipping. As specific concerns about the balance sheet emerged, Potlatch's promise of economic development was neglected.

This was Potlatch's first overseas venture, and by 1976, after only a short period of operation, the project was not profitable. So Potlatch left Samoa, and the government was left holding large loans and other commitments it

had made as part of the incentives package provided to the corporation. To offset the loss of Potlatch, the government entered a smaller-scale forestry joint venture with an Australian company.

What had been learned? While some of Samoa's forests had become available for export as part of the government's development program, the rhetoric of development and the economic realities of the project were at odds. Potlatch had promised to launch Western Samoa "into the mainstream of economic development" (Potlatch 1971:3), and the government had supported the project. Yet anticipated revenues went unrealized, and the practice of "sustained yield" forestry remained largely experimental. The result of Potlatch's departure was a major economic setback for the government. But it could have been worse. Potlatch itself had not irreversibly exploited the forests of Savai'i. In fact, so much attention had been paid to Potlatch that the actual deforestation by smaller mills and by Samoan villagers had been overlooked.

Potlatch was not the only commercial timber mill in the islands. Smaller mills existed before Potlatch and continued after Potlatch's departure, producing for the domestic market and for export. Potlatch's own large mill also remained in use after the company left. Their cumulative impact on the limited amount of merchantable forest was significant. As Ward notes:

In 1972 exports of timber began following the establishment of [Potlatch's] large mill at Asau which drew logs from the forest of western Savai'i. Several smaller mills continued to operate, largely for the domestic market. The peak production for local and export consumption was in the late 1970s and the early 1980s. It became clear that at current rates of logging the merchantable forest would all be cut out by about the year 2000 and the government imposed a regime involving reductions in the allowable cut. A ban on log exports was imposed in 1990 and then the export trade was brought to an end by the damage to forests caused by Cyclones Ofa and Val in 1990 and 1991 respectively. (1995:84)

The rapid decline of Samoa's exportable timber was accompanied by an increase in lumber imports and by increased milling for domestic consumption.

Sustainability, Development, and Village Agriculture

By the 1970s the government was initiating efforts to sustain Samoa's forests or at least to reduce forest losses. In 1974 the New Zealand Bilateral Aid Programme began providing funds for forestry research, development, train-

ing, equipment purchases, and reforestation efforts. A Forestry Division was established within the Department of Agriculture. In 1980 the Asian Development Bank provided a soft loan. Tree nurseries were established in three areas. Personnel were hired and trained. Other conservation projects included the establishment of a national park, the first in the South Pacific; four reserves; and, since the cyclones of the early 1990s, a Watershed Protection and Management Project.

The principles and objectives of the government's forestry policy were clearly enunciated in *Western Samoa's Fifth Development Plan: 1985-1987*. They were

- to maintain and establish where necessary areas of forest adequate to protect the climatic, soil and water resources of the country;
- to provide on a sustained yield basis the forest produce requirements of the people and to encourage an export trade; and
- to ensure the best use of all forest land for the general benefit of the country. (Department of Economic Development 1984:86)

The plan did not avoid the reality of deforestation; it stated: "Estimates show that at the current rate of removal . . . the bulk of Western Samoa's indigenous wood resources would be depleted by the year 1995" (ibid.:66). Yet the apparent disjuncture between the projected depletion of Samoan forests by 1995 and the desire to develop an export trade through sustained-yield forestry was not discussed in the report.

The 1985-1987 *Development Plan* was not unusual in its insistence on both promoting development through forestry exports and sustaining the forests themselves. But the numbers did not add up; there was a direct trade-off rather than a synergistic take-off. Moreover, the government recognized that the most significant contribution to deforestation was not coming from timber exports, although they played a supporting role, but from village agriculture and other domestic uses.

By the latter half of the twentieth century, many Samoans no longer lived immediately adjacent to the forest, and increasingly urban and peri-urban populations were less knowledgeable about particular species (Cameron 1962). Although forest land remained mostly under village control and still provided new agricultural land as well as timber for houses and fuel, gathering of wild plants and hunting of forest species were less common than they once were.⁸

The pressure to cut forest for new agricultural land has increased in recent decades owing to shorter fallow cycles, declining soil fertility, a growing population, and increased demand for cash.⁹ In the 1950s, for example, a

changing mix of these factors increased forest cutting on parts of Upolu (Farrell and Ward 1962:199). Older coconut trees were becoming less productive, and declining soil fertility led planters to seek new land. In areas where there was more volcanic rock, existing intensive cultivation and shorter fallow cycles also led to pressure to cut the forest. And new cash crops, like bananas in the 1950s, could require increased landholdings, although the failure of the banana boom in the 1960s left some land available for other crops.

More recently, pressure to cut virgin forest has intensified throughout the islands. In his study of Samoan planters in the 1980s, Tim O'Meara found:

With greater population pressure and more demand for cash today, people extend their land holdings by clearing most new taro plots from virgin forest. Seeing this primary expansion, planters now rush to clear the forest farther and farther from the village in order to claim as much new land as possible and thus avert land shortages for their families in the future. Some wealthy village planters even hire gangs of workers with chainsaws to clear land for them. The unfortunate result of this secondary expansion is that people replant only part of their old taro plots in coconuts—just enough to seal their long term claim to the land. Then they push higher up the slopes to clear more virgin forest. . . . As a result of this expansionary strategy, many families have far more coconut lands than they can currently work efficiently. (1990:62–63)

O'Meara also reports that a generation ago taro plantations were only about two miles inland, whereas by the 1980s new gardens were being cleared almost four miles inland on steeper slopes and at higher altitudes where taro does not grow as well (*ibid.*:69).

Additional trends also exacerbated village cutting of the forest for agriculture in the 1980s, which, along with other domestic uses, accounted for about 80 percent of the total cut (Ward 1995:74). A better system of roads pushed into the interior, making access to forests from coastal villages easier. And more people moved permanently inland, especially as water, including piped water, became easier to store. Rural electrification and the leasing of government land also contributed to movement inland.

Another important factor contributing to deforestation was the changing system of land tenure. As O'Meara has carefully documented, there has been a subtle but significant *de facto* shift in village land tenure toward more individualized holdings, giving titleholders access to more land and giving younger Samoans a greater share (O'Meara 1987, 1990, 1995). Since agricultural tenure involves use by right, those individuals and families able to cut more

forest and plant crops will have more land. The advent of the chainsaw made additional clearing easier, as Cluny Macpherson notes in his article "The Road to Power Is a Chainsaw" (1988). This new tool expedited deforestation. The newly cut land was often planted in taro, an emerging export crop consumed by emigrant communities of Samoans overseas as well as consumed and marketed domestically. As the value of copra and cocoa declined, taro became a popular replacement crop.

In the village in which I did fieldwork periodically from 1966 through 1984, these changes were dramatic. In the 1960s coconut palms were intercultivated with cacao trees and bananas, which in turn might border taro plants at the lowest tier of a multilayered agricultural regime. By 1984 much of the village had moved inland to the main road, and more land had been cleared by chainsaw for planting taro. The new land was easier to clear, plant, and weed, leaving older coconut and cacao plantations to fall into disrepair. Taro exports soared, but taro was vulnerable to disease and, in the early 1990s, taro leaf blight virtually eliminated taro production throughout Samoa. The new land that had been planted in taro was now planted with other crops that were not as commercially profitable or was left to lie fallow as people waited for the blight to subside.

Deforestation Nevertheless

From an environmental viewpoint, the Samoan pattern of establishing new gardens may seem less damaging than true commercial clear-cutting, a common form of logging used by multinational corporations elsewhere in the world. After the cut, Samoan domestic planting, coupled with weed growth and regrowth, holds soils more effectively than forest that is simply clear-cut and abandoned. In addition, much lowland forest in Samoa is on gentle slopes with porous soils, so erosion and runoff are less severe than might be expected. Yet the expansion of village agriculture was leading to deforestation nevertheless.

More forest was being cut than could be replaced by regeneration and reforestation. In 1993 the actual cut was almost twice the sustainable cut (World Bank 1996:74). It now seems likely that the fragile forests of these tropical islands cannot be regenerated, so the loss will be permanent. In addition, several already-endangered species are threatened. But these ecological concerns, so important to Western conservationists, are not likely to become as important to Samoans until the costs of deforestation become more evident on a practical level—with increasing distances walked for planting, firewood, and house-building materials or with increased monetary costs. Increased imports of wood and wood products may also lead to greater efforts at conservation.¹⁰

As Samoa becomes more affluent, the environmental costs of deforestation could be reduced by substitution of fossil fuels and alternative building materials for wood. And more money could allow for the purchase of food instead of reliance on gardens. These trends are occurring. In neighboring American Samoa, with its much higher income levels, gas and electricity, imported food, and concrete, hurricane-resistant homes are the norm. But most Samoans in western Samoa have not reached this standard of living and may not, because it is the result of massive American support for American Samoa. In western Samoa, many villagers still require forests for basic subsistence and other economic needs. And there is no guarantee that the rate of deforestation would lessen in the near future with increased income.

Because the expansion of village agricultural landholdings occurred during a period when agricultural export earnings were declining, Deborah Paulson, in her study of deforestation in Samoa, wondered what might happen to the rate of deforestation if global demand for village agricultural products improved. She states that

it is difficult to imagine what positive changes in the global political economy alone could slow or end expansion of agriculture in Western Samoa, as its peripheral geographic position limits its non-agricultural options (Ward, 1993). Improved terms of trade would increase crop prices and probably lead to more forest conversion. Better markets for a diversity of crops might produce more intensive and sustainable use of land that has already been cleared, but unless demand is controlled, there is no reason to expect better markets to prevent clearing of the remaining forest areas that can support crops (Boserup, 1965; Clarke, 1966). In fact, as people's financial situations improve, they could purchase vehicles which would make more distant, now-forested, land accessible for conversion. (Paulson 1994:329-330)

Village agriculture exports, though, have been eclipsed by Samoa's new economic ties to the wider world: foreign aid, migration, and remittances. The economy no longer relies on a growing agricultural export sector, even though it remains a primary development goal. Instead, over the last three decades, there has been a growing government sector supported by foreign aid, some new employment opportunities provided by private foreign investors like the Japanese auto parts manufacturer Yazaki, and rising incomes due primarily to remittances sent or brought back by the tens of thousands of Samoans overseas (see Evans, this volume, for discussion of such economic ties in Tonga).¹¹

Half of the Samoan population is now permanently abroad. Remittances, a major source of personal income for most Samoans, have allowed increased

local consumption without the limitations of low income ceilings imposed by village agriculture (Shankman 1990). By providing cash for locally milled timber, for new homes inland, for chainsaws, for vehicles, and for paying timber-cutting laborers, remittances and other forms of cash income may be contributing to deforestation. Thus, although agricultural land is being cleared in anticipation of future economic value, most Samoans will continue to rely more on migration and remittances as well as nonagricultural employment for a major portion of their income. Because village agricultural exports are unlikely to catch up with remittances and cash employment as an income stream, land may remain more valuable for subsistence and other uses than for export-based agricultural income.

Deforestation and Local Control

Deforestation in Samoa is not the result of a massive, singular assault; instead, it is the result of many independent family and individual decisions to extend agricultural landholdings farther inland and to establish claim to land that would otherwise go to others. The short-term benefits to villagers cutting the forest for land in anticipation of future subsistence and cash-crop production are weighed against the risks of not acquiring land when costs of acquisition are relatively low and opportunities to acquire land are relatively high. Land formerly held in common by a village now has become the property of families and individuals. The tragedy of the commons is occurring as the forest is privatized in piecemeal fashion.

Deforestation in Samoa has not been driven externally by ruthless multinationals, invasions of landless peasants and refugees, or exploitative landlords as is the case in much of the world. Local control has been affected by wider forces but has not been lost. Most Samoan villagers firmly believe that their acquisition of forest for agriculture is an appropriate use of their land. Paulson argues:

Unlike many places where local control of natural resources has been lost, Western Samoa's traditional land-tenure system survived the colonial period intact, and local government remains strong relative to national government. The traditional land-managers have responded to population growth, increasing material aspirations, and greater agricultural market opportunities with changes in the land-tenure system which have facilitated the conversion of forest to agriculture. (1994:329)

The Samoan case seems to run counter to the hope that local control will lead to sustainable use of forests. For example, in the 1998 edition of *State*

of the World: A Worldwatch Institute Report on Progress Toward a Sustainable Society, the author of "Sustaining the World's Forests" argues: "A proven way to reconnect costs and benefits of forest management is by returning—or devolving—control of forests to communities. Community control can improve the prospects for sustainability of the forests and the quality of life of people in or near the forest" (Abramovitz 1998:38). While this may be true for the examples from India that the author cites, it is not necessarily true everywhere. Very careful consideration must be given to the circumstances in which local control can promote sustainability and those in which it cannot. In Samoa, sustainability of forest resources has not been a priority for most villagers.

In the late 1980s, though, the remarkable efforts of ethnobotanist Paul Cox initiated a significant movement toward forest preservation and conservation at the village level. Using private foreign assistance to pay off a loan that would have otherwise required the cutting of forest on village land, Cox was able to work with villagers in preserving a large section of forest at Falealupo on Savai'i. A second village-managed reserve was established on the Tafua Peninsula (Cox 1997; Cox and Elmqvist 1991, 1997; Elmqvist et al. 1994). Regrettably, one of the tropical cyclones of the early 1990s badly damaged Falealupo village and its forest, but the projects are alive and well. The Falealupo Rain Forest Preserve in particular has demonstrated its attractiveness as an ecotourism site with its elevated forest-canopy walkway.

Cox and Elmqvist (1993) suggest that village control can be compatible with preservation of the forest while "ecocolonialism"—the imposition of Western conservation paradigms on indigenous people—may neglect issues of local knowledge and participation. The Falealupo and Tafua projects do involve local knowledge and participation. Yet Paulson wonders if such externally funded efforts may inadvertently commercialize the forest as villagers request cash payment up front for conservation efforts (1994). The potential for expanding this kind of preservation project remains unclear at the present time.

There is also an emerging Samoan environmental movement and an interest in ecotourism that could build local constituencies, which might increase conservation in the future. And, as noted earlier, there have been governmental efforts to sustain the forests of Samoa: the establishment of a forestry board with reforestation plans, a national park as well as four timber reserves, and the 1985–1987 *Development Plan* that explicitly addressed the need for additional conservation measures. Furthermore, the international environmental movement as represented in the South Pacific Regional Environment Programme and other regional organizations is creating a heightened awareness of conservation issues in Samoa. Yet taken altogether the above-mentioned efforts have not slowed the cutting of the forests. Even

though timber exports have now virtually ceased and the effects of indigenous deforestation are becoming more apparent, there is still no large-scale incentive to reduce further deforestation by villagers.

At the village level, forest cutting has increased in a competitive rush for future agricultural land. As cutting extends farther inland, family and village interests have come into conflict with government policies about watershed preservation. The government believes in forest reserves for the prevention of soil erosion, the maintenance of water supplies, and reduction of lagoon siltation. But villagers do not necessarily view the forest in the same way, and they hold tenure over most of it. The Forestry Division acknowledges the difficulty for villagers to accept a preservationist ethic if it means sacrificing their economic interests in acquiring more land. And for villagers, local autonomy and resistance to what they see as government encroachment are important considerations. Although some coastal villages can clearly see the problems of siltation and a reduction in lagoon productivity, inland villagers may not. So, although legislation has been passed to preserve watershed, many villagers simply ignore it and continue to cut.

Conclusion

Deforestation is occurring for a variety of reasons throughout the South Pacific (Barlow and Winduo 1997). In their summary of deforestation in the region as a whole, Clarke and Thaman conclude: "As there is almost no likelihood that forest loss in the Pacific will slow during the next several years—and perhaps not until loggable forests are cut and most agriculturally usable land now under forest has been converted to agriculture—the forests that remain are fated to dwindle away, their demise augmenting the worldwide spasm of extinction" (1997:122). Yet, as Clarke and Thaman point out, "Against this bleak scenario of deforestation and the extinction of biodiversity there exist possibilities for protecting and increasing biodiversity in the agricultural, village, and urban landscapes, even though at present there is also the tendency toward ecosystem simplification and the loss of biodiversity" (ibid.). They recommend a strategy of "incremental agroforestry" incorporating selected diverse, local species into village agriculture not for the sake of export, but to manage and increase biodiversity.

Incremental agroforestry is very different from the standard, development-oriented monocropping of imported tree species for export-oriented timber and agricultural development. Preliminary recommendations for agroforestry in Samoa have been made in a recent United Nations Development Programme report that inventories species, reviews practices, and establishes planning priorities. While this incremental agroforestry strategy does offer

an alternative to an "end-of-the-world" scenario for island ecosystems, to what extent it can work in Samoa remains to be seen. In 1962 Cameron recommended a similar "integrated" approach to village agriculture to no avail. Other solutions to deforestation in Samoa thus far have had only limited success.

In retrospect it is easy to see what might have been done for Samoa's forests. Given predictions published in 1962, perhaps timber exports should not have been permitted, and immediate efforts to ameliorate the long-term effects of village cutting should have been undertaken. But this retrospective view does not take into account the everyday needs of Samoans or the actual relationship of government to villagers. Nor does it factor in the complex web of broader forces in which both villagers and the government are enmeshed.

For policymakers, the rhetoric of development was enticing for the newly independent country of (Western) Samoa in 1962, and the external financing of development institutions and programs gave it additional weight. Government definitions of sustainability were so flexible that they could accommodate recommendations for large-scale exports of timber even when sustainability and timber exports could not, in fact, be reconciled. Samoans themselves have been responsive to changing economic, ecological, and technological conditions. The short-term benefits of expanding local agricultural holdings were well understood, while the long-term consequences of deforestation were not. As it turned out, the concern in the 1970s over foreign exploitation of Samoa's forests by companies like Potlatch was misplaced. Indigenous agricultural practices have been the major contributor to deforestation for decades.

The problem of sustainability facing Samoa today may not be specific to the sustainability of its forests or to developing "incremental agroforestry." It may be broader and perhaps more basic—reducing economic vulnerability so that long-term interests and short-term priorities can be reconciled. Such abstract policy recommendations are easy to invoke but very difficult to implement. In the case of forests, much is known. What is not known is how to slow, halt, or possibly reverse the deforestation process. As a result, Samoa's forests remain at risk.

NOTES

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1. There are actually several different forest zones in Samoa, each with its own distinctive ecology (Cameron 1962).
2. Among these sources are Cameron 1962; Ward 1995; Cox and Elmqvist 1991, 1993, 1997; Cox 1997; Cox et al. 1991; Elmqvist et al. 1994; and Paulson 1994. A more detailed discussion of Potlatch can be found in Shankman 1978.
3. This article reviews the deforestation of Samoa in terms of broad trends. Some of the finer detail that would be part of a longer article has been omitted here. Readers may want to consult the references cited for additional information.
4. This is the Stace and Lauterbach study (1963). Samoan expert J. W. Davidson gave the following assessment of this study: "Despite Stace's intimate knowledge of Samoa (and of the Pacific Islands, generally), the report that he and his colleagues produced in early 1963 was a disappointing one. Though it was issued in both their names, it consisted of two parts which they clearly drafted separately. These overlapped, and were to some extent, inconsistent. Much of the analysis was trite or woolly. Many of the recommendations seemed to reflect little more than a simple acceptance of ideas that were already in circulation. The work of the economists was later supplemented by more specialized studies by other United Nations experts; but these, too, mainly failed to relate fact and theory rigorously enough to provide a firm basis for a development plan" (1967:419–420).
5. The entire issue of this Potlatch publication is devoted to Samoa. In 1973 Potlatch Forests, Inc., became the Potlatch Corporation.
6. By 1973 Potlatch had leased 80,000 acres.
7. The Samoan system of land tenure and social organization is considerably more complex than is presented in this article. Such terms as "communal" land tenure and "extended family" are glosses for subjects that deserve much fuller explication. Among the more detailed accounts are Davidson 1967, Gilson 1970, Nayacakalou 1960, and Farrell and Ward 1962. O'Meara's recent work (1987, 1990, 1995) documents the individualization of this system. See Crocombe 1995 for an overview of changing land-tenure systems and sustainability in the South Pacific.
8. Flying foxes, however, have become a supplementary food source, and these animals were exported to Guam where they are regarded as a delicacy. As major forest pollinators, reduced numbers of the two species of flying fox could imperil forest regeneration (Cox

and Elmqvist 1991; Cox et al. 1991). In Samoa, one of the species is considered endangered, and both species of flying fox are under international protection.

9. Other factors may also be important. O'Meara discusses political factors that may lead villages and titleholders to allocate forest land to untitled persons (1995).

10. Of course, these arguments are largely hypothetical for the following reasons. Local mills may not offset imported lumber because they have a reputation for producing lower-quality timber. Moreover, the tropical cyclones of the early 1990s led to a questioning of wooden house construction and a favoring of cement block-based, metal-framed "hurricane houses." Increasing remittances allow for timber imports and more modern housing. But with fewer opportunities for migration and a possible lessening of remittances, coupled with reduced opportunities for government employment as a result of International Monetary Fund and Asian Development Bank policies, there may be less cash available for imports. With less migration and fewer government job possibilities, an increasing rural population may lead to further forest clearance at the village level.

Increasing economic stratification in Samoa has led to different strategies for different segments of the rural population. Thus, wealthier villagers do not walk to their plantations; they drive. They do not use much firewood because they can afford kerosene. They can increase their labor force temporarily by hiring others for forest clearance, and they can reduce some labor costs by purchasing herbicides for weed control. For poorer villagers, these strategies are less feasible.

11. Bertram and Watters (1985) discuss this pattern for a number of Pacific Islands economies.

REFERENCES

Abramovitz, J. N.

1998 Sustaining the World's Forests. In *State of the World: 1998*, ed. L. Brown et al., 21-40. New York: W. W. Norton.

Barlow, K., and S. Winduo, eds.

1997 Logging the Southwest Pacific: Perspectives from Papua New Guinea, Solomon Islands, and Vanuatu. Special issue, *The Contemporary Pacific* 9 (1).

Bertram, I. G., and R. F. Watters

1985 The MIRAB Economy in the South Pacific Microstates. *Pacific Viewpoint* 26: 497-519.

Boserup, E.

1965 *The Conditions of Agricultural Growth*. Chicago: Aldine.

Cameron, S. S.

1962 Vegetation and Forest Resources. In *Western Samoa: Land, Life, and Agriculture in Tropical Polynesia*, ed. J. W. Fox and K. B. Cumberland, 63-77. Christchurch: Whitcombe and Tombs.

- Clarke, W. C.
1966 From Extensive to Intensive Shifting Cultivation: A Succession from New Guinea. *Ethnology* 5:347-359.
- Clarke, W. C., and R. Thaman
1997 Incremental Agroforestry: Enriching Pacific Landscapes. *The Contemporary Pacific* 9 (1): 121-148.
- Cox, P. A.
1997 *Nafanua: Saving the Samoan Rainforest*. San Francisco: W. H. Freeman.
- Cox, P. A., and T. Elmqvist
1991 Indigenous Control of Tropical Rainforest Resources: An Alternative Strategy for Conservation. *Ambio* 20 (7): 317-321.
1993 Ecocolonialism and Indigenous Knowledge Systems: Village-Controlled Rainforest Preserves in Samoa. *Pacific Conservation Biology* 1 (1): 6-13.
1997 Ecocolonialism and Indigenous-Controlled Rainforest Preserves in Samoa. *Ambio* 26 (2): 84-89.
- Cox, P. A., T. Elmqvist, E. D. Pierson, and W. F. Rainey
1991 Flying Foxes as Strong Interactors in South Pacific Island Ecosystems: A Conservation Hypothesis. *Conservation Biology* 5 (4): 448-454.
- Crocombe, R.
1995 Overview. In *Customary Land Tenure and Sustainable Development: Complementarity or Conflict?*, ed. R. Crocombe, 5-21. Suva: Institute of Pacific Studies, University of the South Pacific.
- Davidson, J. W.
1967 *Samoa mo Samoa*. Melbourne: Oxford University Press.
- Department of Economic Development
1984 *Western Samoa's Fifth Development Plan: 1985-1987*. Apia: Government of Western Samoa.
- Elmqvist, T., P. A. Cox, W. E. Rainey, and E. D. Pierson, eds.
1994 *The Rain Forest and the Flying Foxes: An Introduction to Rainforest Preserves on Savai'i, Western Samoa*. Western Samoa: Fa'asao Savai'i Society.
- Farrell, B. H., and R. G. Ward
1962 The Village and Its Agriculture. In *Western Samoa: Land, Life, and Agriculture in Tropical Polynesia*, ed. J. W. Fox and K. B. Cumberland, 177-238. Christchurch: Whitcombe and Tombs.
- Fisk, E. K.
1962 Planning in a Primitive Society: Special Problems in Papua/New Guinea. *Economic Record* 38:462-478.

- Food and Agricultural Organization of the United Nations
1993 *Development of Vaisigano Pilot Watershed Management Project, Samoa: Project Findings and Recommendations*. Rome: United Nations Development Programme.
- Fox, J. W., and K. B. Cumberland, eds.
1962 *Western Samoa: Land, Life, and Agriculture in Tropical Polynesia*. Christchurch: Whitcombe and Tombs.
- Gerakas, A.
1964 *Information on the Economy of Western Samoa*. Development Secretariat Public Bulletin, no. 1. Apia: Government of Western Samoa.
- Gilson, R. P.
1970 *Samoa 1830-1900: The Politics of a Multicultural Community*. Melbourne: Oxford University Press.
- Kirch, P. V.
1989 Prehistory. In *Developments in Polynesian Ethnography*, ed. A. Howard and R. Borofsky, 13-46. Honolulu: University of Hawai'i Press.
- Macpherson, C.
1988 The Road to Power Is a Chainsaw: Villages and Innovation in Western Samoa. *Pacific Studies* 11 (2): 1-24.
- Nayacakalou, R. R.
1960 Land Tenure and Social Organisation in Western Samoa. *Journal of the Polynesian Society* 69:104-122.
- Olson, M. D.
1997 Re-constructing Landscapes: The Social Forest, Nature, and the Spirit World in Samoa. *Journal of the Polynesian Society* 106 (1): 7-32.
- O'Meara, T.
1987 Samoa: Customary Individualism. In *Land Tenure in the Pacific*, 3d edition, ed. R. Crocombe, 74-113. Suva: University of the South Pacific.
1990 *Samoan Planters: Tradition and Economic Development in Polynesia*. New York: Holt, Rinehart and Winston.
1995 From Corporate to Individual Land Tenure in Western Samoa. In *Land, Custom, and Practice in the South Pacific*, ed. R. G. Ward and E. Kingdon, 109-156. Cambridge: Cambridge University Press.
- Paulson, D.
1994 Understanding Tropical Deforestation: The Case of Western Samoa. *Environmental Conservation* 21:326-332.
- Potlatch Forests
1971 *The Potlatch Story*. San Francisco: Potlatch Forests, Inc.

Shankman, P.

- 1975 A Forestry Scheme in Samoa. *Natural History* 84 (8): 60–69.
- 1978 Notes on a Corporate "Potlatch": The Lumber Industry in Samoa. In *The World as a Company Town*, ed. A. Idris-Soven, E. Idris-Soven, and M. K. Vaughan, 375–404. The Hague: Mouton.
- 1990 Phases of Dependency in Western Samoa. *Practicing Anthropology* 12 (1): 12–13, 20.

Stace, V. D., and A. Lauterbach

- 1963 *Economic Survey and Proposed Development Measures for Western Samoa*. Legislative Assembly of Western Samoa, Sessional Paper 21.

Stanner, W. E. H.

- 1953 *The South Seas in Transition*. Sydney: Australasian Publishing.

Ward, R. G.

- 1993 South Pacific Futures: Paradise, Property, or Pauperism? *The Contemporary Pacific* 5 (1): 1–21.
- 1995 Deforestation in Western Samoa. *Pacific Viewpoint* 36 (1): 73–93.

World Bank

- 1996 *Pacific Island Economies: Building a Resilient Economic Base for the Twenty-first Century*. Washington, D.C.: World Bank.