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ENVIRONMENTAL CHANGE, ECONOMIC DEVELOPMENT, AND EMIGRATION IN TUVALU

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Growing consensus on the accelerated greenhouse effect indicates that potential increases in both sea levels and tropical storms will pose problems for atoll states, especially Tuvalu. Land areas and water supplies may be threatened by coastal erosion, depleting agricultural and fisheries potential. Tuvalu's economy is limited and partly reliant on aid and remittances whose sustainability is uncertain. More than a third of the population now lives in overcrowded conditions in the urban center of Funafuti. Population growth has accelerated since independence, despite attempts to implement a population policy, while opportunities for temporary or permanent emigration have not increased. If environmental changes exacerbate domestic development strategies, Tuvaluans are more likely to become "environmental refugees," creating new human-rights issues.

IN THE PAST DECADE concern has increased over the possible impact of the accelerated greenhouse effect on sea-level rise and thus over the implications of that sea-level rise for countries with substantial areas of land at or close to sea level. Many island states fall into this category, none more so than those where coral atolls predominate, since atolls rarely rise even three meters above sea level. For most coastal dwellers one response to rising sea levels is moving inland to higher ground. For residents on atolls, such a choice is not possible, as high land does not exist. Though all island states face new environmental problems, as many people, all urban centers, and much infrastructure related to tourism, trade, and economic development are concentrated on the coast, the five world states composed solely of atolls—Tuvalu, Tokelau, Kiribati, the Maldives, and the Marshall Islands—are most at risk. It is in these atoll states that the challenges posed by global warming are most severe and where the necessity to respond to the threat of the greenhouse effect is most apparent (Connell and Lea 1992). Small

island states also face difficult economic circumstances; they are remote, with economies that are dependent on primary commodity production and increasingly on aid, but the potential “aid fatigue” of metropolitan nations coupled with increasing expectations over standards of living pose new challenges for future socioeconomic development. This article examines the recent development trajectory in the very small island state of Tuvalu, the extent to which contemporary problems may be exacerbated by the greenhouse effect, and the possible outcomes.

Tuvalu is one of the smallest independent nations in the world in its population size, land mass, and national economy. In the nineteenth century the island group, then called the Ellice Islands, along with its northern neighbors the Gilbert Islands became separate British protectorates jointly governed in the interest of administrative convenience. This arrangement was formalized in 1915, when the two protectorates merged into the Gilbert and Ellice Islands Colony. In 1975 the Ellice Islands voted to secede (Macdonald 1975), and Tuvalu became an independent state in 1978 (Connell 1980). It is an archipelago consisting of three small reef islands and six coral atolls located on the western margin of Polynesia and some one thousand kilometers north of Fiji. A total land area of only 24.4 square kilometers is spread over 750,000 square kilometers of the central Pacific; the largest island, Vaitupu, has just 4.9 square kilometers. The highest point in the country is no more than five meters above sea level, and most areas are well below that; hence Tuvalu is highly vulnerable to natural hazards. Over a third of the population of ten thousand is concentrated on the main island of Funafuti, which has an area of just 2.4 square kilometers. Tuvalu suffers from most of the conventional disadvantages of small island states, further accentuated by very small size, extreme isolation and fragmentation, and thin and porous coral soils lacking in nutrients, thus making agricultural and most other forms of development exceptionally difficult. There are also severe problems related to administration, transportation and communications, an inadequate social and economic infrastructure, a small entrepreneurial base, limited skilled human resources, and few development projects that can attract external financial support.

Population growth has been rapid in the postwar years and has not been relieved by the safety valve of outmigration as has occurred in most other parts of Polynesia (especially in New Zealand dependencies). Agricultural and fisheries production has not grown as rapidly as population, and a transition to imported food, especially rice, has followed changing tastes, preferences, and convenience. This transition has been so substantial that in Tuvalu, as in other atoll states, imported foods and drinks now constitute about a third of all imports by value, a substantial

drain on domestic resources. The combination of high postwar rates of population increase, a growing desire for consumer goods, the location of the hospital in the single urban center, and the concentration of formal-sector employment there has resulted in urban migration from the islands of the periphery. Rapid urbanization even in a very small state has posed a range of social problems, all of which are complicated by the threat of climatic change.

The Greenhouse Effect

Scientific studies have drawn increasingly consistent conclusions regarding future climatic trends. Although enormous uncertainty remains, especially over chronology, some indication of the impact is possible. That impact is likely to involve rising sea levels, with some low-lying lands inundated and coasts eroded. Erosion is not unusual and was evident in Nanumea and Nukufetau even before recent concerns over accelerated sea-level rise. A gradual rise of mean sea level will progressively lift the zone of flooding and increase the impact of storm waves, eroding areas hitherto considered safe. Human responses will vary depending on the value of the coastal land under attack and the resources available to provide protective measures. In states where resources are very limited and small populations thinly spread, the provision of expensive engineering works will not be a commonly available option.

Coastal erosion will increase as the rise of sea levels accelerates, perhaps beyond the upward growth of corals, and this erosion will probably be accentuated by the greater frequency of storms. Increased temperatures will decrease human comfort in the tropics and may worsen human health. The intertropical convergence zone is likely to shift northwards, changing the distribution of zones of upwelling, hence altering the distribution of fish stocks and thus affecting fisheries. Such major climatic changes as the frequency and severity of cyclones and tropical storms may also increase as temperatures increase.

Island ecology, in terms of the capacity to support human habitation, is closely tied to the existence of a permanent groundwater system. Islands above a certain size, about 1.5 hectares, contain a permanent lens of fresh water surrounded by salt water. The volume of the lens is roughly proportional to the surface area of the atoll. Hence a decline in the area of an atoll would have a disproportionate impact on the volume of the lens. During droughts water-table levels fall and the groundwater may become brackish. Environmental stress is manifested by trees losing leaves, not fruiting, and even dying. Yet the most severe threat to permanent water supplies is not

from climatic factors directly, but rather from marine processes that cause coastal erosion and increase the frequency of storm overwash.

Increased groundwater salinity will reduce its potability, which for most atolls is currently of considerable significance. It will also reduce the productivity of agriculture, since no plant species will gain from increased salinity. In drought conditions access to groundwater on atolls is crucial, although on some atolls with reasonably high rainfall construction of better cisterns may enable the use of groundwater to be minimized or even ended. If increased salinity is combined with any long-term decline in rainfall, as is possible in some areas, the results will be even more serious, since the cost of water purification and desalination is extremely high. If groundwater becomes no longer potable, human habitation will be effectively impossible. Fresh water is most scarce after cyclones or tidal waves have swept over an atoll, salting soils and wells, a situation likely to increase under greenhouse conditions (Roy and Connell 1991). Tropical storms are of present concern in Tuvalu. The national submission to the United Nations Framework Convention on Climate Change (UNFCCC) meeting in Kyoto, Japan, in December 1997 stated:

We are already experiencing increased frequency of cyclones, tornadoes, flooding and tide surges, many of which hit us outside the usual climatic seasons. This year alone, in 1997, Tuvalu was devastated by three tropical cyclones: the first two in March—Gavin and Hina—and more recently Keli. The costs of these effects to us in Tuvalu is enormous. Not only were houses and whole villages damaged, but also vegetation and food crops were completely destroyed. In one recent incident, an entire island community was left homeless and its vegetation damaged so much so that the island is uninhabitable right now. In another incident, one whole islet completely disappeared into thin air. Erosion to coastal areas of our already scarce land is further worsened, and the increased salinity in underground water is seriously affecting not only vegetation and traditional food crops but also the health and lives of the people. (Quoted in *Pacific News Bulletin*, December 1997, 7)

Erosion reduces land area, and, where there is minimal elevation, such losses may become severe and increase the swampiness and salinity of areas that remain above sea level. Areas immediately at risk will be those that have previously been reclaimed from the sea, including parts of Funafuti, the main island and urban center, now used for agriculture and roads. Land

losses will lead to a decline in agricultural production, increased competition for scarce land, and a related decline in handicraft materials (such as wood and pandanus) and firewood, which is already in extremely short supply in the urban area. Such changes will further threaten the already limited subsistence base and introduce new environmental problems. Erosion of fringing reefs may disturb and reduce the distinctiveness of lagoon ecology as lagoons increasingly become indistinguishable in content from the surrounding ocean. Mangrove habitats may also be damaged. This damage would reduce the artisanal fishing potential of many areas, especially where lagoons currently provide fisheries diversity.

The greenhouse effect is likely therefore to lead to reduced agricultural production, a possible decline in fisheries production, and a loss of vital water, timber, and firewood resources, thus reducing the potential of the few areas in which island states currently demonstrate a degree of self-reliance. These effects will occur alongside continued population growth. An increase in population pressure on diminishing resources will further encourage rural-urban migration from the outer islands in search of wages and salaries, rather than the increasingly unpredictable agricultural and fisheries income.

Much of what is currently known about the impact of the greenhouse effect is derived from conjecture and speculation, since the order of magnitude of future physical events cannot be determined, and there is no real precedent for what is likely to follow. Though the postglacial marine transgression that ended around six thousand years ago must have had a similar effect, it occurred in a vastly different social and economic context, leaving few records of its human impact (and none in then uninhabited Polynesia). With complex and interrelated causes and with consequences involving changing natural processes and a variety of human adaptations to those changes, the greenhouse effect is effectively an uncontrolled experiment on a global scale. Whatever the outcome, it is apparent that the greenhouse effect offers nothing positive to tropical island states. In atoll states like Tuvalu where all the land is low-lying, problems will be more apparent and quicker to occur.

Island states have consequently sought to discourage greenhouse-gas production, most of which occurs in the north, individually and through the Association of Small Island States (AOSIS) in international and regional forums. Island states themselves have done little or nothing to cause changes in atmospheric composition and thus in global climate change, nor can they directly influence mitigation. As the prime minister of Tuvalu, Bikenibeu Paeniu, has said: "We strongly believe that we have done the least to cause this hazardous problem, although we are now faced with the highest possibility of losing the most" (*Pacific Report*, 10 July 1997, 5). Collectively the

island states have had some success, notably in negotiations leading to the United Nations Framework on Climate Change (signed at Rio de Janeiro in 1992), but subsequent achievements have been fewer. In the Pacific region this downturn was most apparent at the South Pacific Forum meeting in September 1997, when island states were unable to reach a consensus on binding targets for greenhouse-gas reductions that would include Australia, a situation that was maintained at the UNFCCC meeting in Japan later in that year. Paeniu led the move by Pacific islands to insist that greenhouse-gas emissions be reduced to a lower level than Australia was prepared to contemplate. Though it has become widely recognized that global warming constitutes a new and significant problem for small island states (Commonwealth Advisory Group 1997), and a considerable threat to security, the impact of small states on international policy changes on global warming has been slight (Shibuya 1997). Even if an international agreement were reached to stabilize global greenhouse-gas production levels, a notion that appears unlikely, there would still be considerable future impact from present greenhouse-gas levels. Adaptation to climate change is therefore essential.

Opportunities for adaptation (and for socioeconomic development) are naturally constrained by limited land areas and the simplicity of atoll environments (where natural ecosystems may easily be disrupted). Moreover, uncertainty over the outcome of the greenhouse effect has restricted the ability and willingness, nationally and internationally, to respond to potential problems through policy formation. Indeed, response is least likely in small island states where information is inadequate, planning offices are small and fully stretched to cope with standard recurrent activities, and options are few. Environmental planning remains in its infancy, and the five-year plans that presently exist are usually the extreme limit of long-term planning. Many conventional measures to reduce vulnerability, such as transferring populations, infrastructure, and economic activities to higher land, are impossible in atoll situations. Other conventional measures, such as the construction of dykes, sea walls, and pumping stations are extremely expensive (especially in developing states, where small populations are spread over a large number of islands). Even defending the urban area would be a complex and costly operation, and would itself be a pointless exercise. Financing for such projects is absent in all small states, and no donor would contemplate aid on the appropriate scale.

However, island states can develop programs to improve environmental conservation and management. Opportunities exist for the increased use of solar energy (rather than expensive, imported greenhouse gas from fossil fuels or local firewood), afforestation (in order both to guard against erosion and storm damage, and to produce new and old species of social and eco-

conomic value), and improved water supplies (especially the construction of rainwater catchments to improve water quality and reduce dependence on underground lenses). Because of increased pressure on resources, especially coastal resources, stemming from rising population and solid-waste disposal problems, the necessity for improved coastal-zone management is paramount. Although none of these policies will significantly reduce the impact of the greenhouse effect, and atoll states cannot develop such policies themselves, still, they would stimulate wise resource use, improve the physical quality of life, and lead to more sustainable development.

An Atoll Economy

In spite of basic difficulties in stimulating development, Tuvalu has experienced limited economic growth in recent years after stagnating in the first half of the 1980s. The GDP per capita has steadily increased to around A\$1,500, representing growth in several sectors including agriculture (especially the subsistence component), manufacturing, and trade. The small and open economy and absence of a national currency restrict the ability of government to manage comprehensive macroeconomic policies. The economy is particularly vulnerable to external influences, including fluctuating aid flows and commodity prices. Tuvalu is heavily dependent on aid for development capital and technical assistance, with most of the budget receiving overseas support. Aid is supported through the now sizable Tuvalu Trust Fund, established in 1987 with substantial contributions from the United Kingdom, New Zealand, and Australia, which provides almost a quarter of total recurrent revenue. Remittances contribute more than 10 percent of national income (substantially more than export earnings) and are mainly derived from nationals working in the phosphate mines on nearby Nauru or on overseas shipping lines. Economic activity is almost entirely dominated by the public sector, which is responsible for most nonsubsistence activities.

In contrast to many other Pacific island states, agriculture is of limited importance, contributing less than 20 percent of GDP, primarily because of the low potential of coral soils. It is still an important activity, primarily because, outside Funafuti, most of the population is at least partly dependent on it. Commercial production was dominated by copra exports, but they ended in 1993 because of low world prices. There is some limited potential for encouraging the production and local marketing of other crops, but distance from markets and intervening opportunities are major constraints to most commercial production. In view of substantial stocks of tuna, the potential for a larger fishing industry is considerable and offers the

best possibilities for future sustainable growth. The industry is currently dominated by small-scale subsistence activities. Fish exports, which were substantial during the 1982–1984 period, ceased in 1985, when the government-owned pole-and-line fishing vessel ended its local operations because of a lack of bait-fish (Fairbairn 1993). Tuvalu benefits from licensing fees gained from its share of the multilateral fisheries treaty with the United States, and some infrastructure and other support services have been developed for future fisheries expansion.

Manufacturing contributes less than 10 percent of GDP and is unlikely to develop much further. Other than handicrafts the sole export-oriented activity is a garments venture sending shirts to Australia. A small number of processing activities—mainly in Funafuti—produce import substitutes for items such as soap and biscuits. Intentions to establish a “mini-industrial zone” on Funafuti have not eventuated. Tourism is similarly of very limited significance because of high transport costs and limited facilities of all kinds. Most visits are related to government activities, and tourism development prospects are poor, though in the 1990s a number of guest houses have complemented the one small hotel on Funafuti.

Most of the workforce in Tuvalu is dependent on rural-based subsistence activities. Formal employment in the wage and salary sector accounted for the small total of just under fourteen hundred people in 1991 and highlights the importance to the country of overseas employment and remittances. Two-thirds of all employment (just over one thousand persons at that time) was in the government sector. Cooperative societies and nongovernment organizations accounted for a further 17 percent of employment, while only 14 percent of all workers, just 130 persons, were employed in the private sector. Working for the government is therefore more dominant in Tuvalu than in almost any other Pacific island state and has grown steadily since independence.

Formal-sector employment is concentrated in Funafuti. In 1991 no fewer than 936 people (68 percent) out of the total wage and salary workforce were located there. This proportion has remained much the same since 1979 despite rapid population growth on the island over that time period. Unemployment on Funafuti has grown during the same period and has become a particular problem because of the limited opportunities for some migrants to gain access to subsistence resources. “Anecdotal evidence suggests that only one in four of all school leavers can now find employment and that the subsistence sector is, in fact, becoming less receptive to the unemployed” (Forsyth and Plange 1992:45). The growth of the formal-sector workforce has been twice that of employment opportunities since the 1980s.

Achieving economic development in Tuvalu has always been difficult. Future expansion of productive activities depends on developments in agriculture and fisheries, and the prospects for Tuvaluans of employment overseas. External employment currently accounts for as much as 18 percent of the total labor force. Shifting the balance in national development from Funafuti to the outer islands is also crucial to the structure of economic change, as the population has become extremely concentrated on one island, putting enormous pressure on services and land areas with consequent problems of urban environmental management. Because of difficulties in expanding agriculture and fisheries and the numerous obstacles to economic growth in such a small island state, Tuvalu is likely to continue to face adverse economic conditions in the foreseeable future.

Population Growth

Documentary evidence on the population of Tuvalu before 1865 is sketchy, but subsequent data are more readily available. In the last quarter of the nineteenth century, the population increased from under twenty-five hundred in 1876 to just over thirty-five hundred at the end of the century. Population growth was then so marked that, as early as the 1890s, resettlement was being suggested as a solution to what was perceived as an impending overpopulation problem. Nineteenth-century evidence suggests that there was a fine balance between population and resources, and extensive controls included both abortion and infanticide. As early as 1865 it was suggested that the islanders were “genuine Malthusians”: “They feared that unless the population was kept down they would not have sufficient food” (cited by Munro and Bedford 1980:3), and the people of Vaitupu were reported to have such a fear of starvation that “there was a rule that only two children should be reared in a family” (*ibid.*). While infanticide was common, it was counterbalanced by extensive adoption. However, such traditional forms of population control were effectively abolished by missionaries, leading to more rapid growth of the population in the second half of the nineteenth century.

Between 1901 and 1911 there was a sharp decline in the resident population of Tuvalu, a result of both rising mortality levels and migration to Ocean Island (Banaba), then a phosphate mine (Munro 1990). Concern for the demographic future of Tuvalu became grounds for considerable pessimism. But the period of decline was brief, and from 1910 onwards the population of Tuvalu has grown steadily (Table 1). Growth became more rapid after the Second World War, primarily because of the more effective extension of modern medical services to the country, which was still a remote archi-

TABLE 1. **Population of Tuvalu**

Year	National Population	Year	National Population
1876	2,497	1963	5,444
1887	2,902	1968	5,782
1901	3,543	1973	5,887
1911	3,080	1979	7,349
1921	3,429	1991	9,043
1931	3,994	1997 (estimate)	10,900
1947	4,487		

pelago in a remote British colony. Growth was fastest during the 1970s (averaging 4.3 percent per annum between 1973 and 1979), as a result of return migration from the new state of Kiribati, but slowed to 1.7 percent between 1979 and 1991. The slower rate of growth was a result of substantial migration away from Tuvalu. Excluding permanent emigrants but including those temporarily overseas (mainly seamen, workers in the Nauru phosphate-mining industry, or students), the *de jure* population of Tuvalu would have been 8,730 in 1979 and 10,114 in 1991. The *de jure* population is regarded in Tuvalu as the more appropriate total for planning purposes on the assumption that almost all those away from the country will return permanently at some point in the future.

The fertility rate in Tuvalu declined steadily between 1965 and 1979, producing, in 1979, a crude birth rate of 23.7 per thousand. Since independence the fertility rate has risen, but it may have stabilized at around the 1991 level of 29.4. The total fertility rate was then estimated at 3.4 but had declined to 3.1 in 1994. A family-planning program began in 1968 and had considerable success until 1973, when there was an apparent decline in the proportion of acceptors, at least until 1979, when the proportion of eligible women practicing family planning was 21.4 percent. The proportion of acceptors has long been twice as high on Funafuti as on the other islands, with an acceptance rate of about 54 percent (in 1990) there and 31 percent on the outer islands. The low acceptance rate and regional variations have been a consequence of cultural inhibitions, the reluctance of men to participate or allow their wives to participate, lack of knowledge and contraceptive availability, and the desire of households to have substantial numbers of children so that at least one might, through migration, become a successful wage or salary earner and provider of remittances (Chambers 1986). Increasing the extent of contraceptive use on the outer islands will prove difficult.

The fall in the fertility rate in the 1960s and 1970s paralleled a fall in the

mortality rate, especially after 1976, when the establishment of an administrative center at Funafuti enabled improved service to the outer islands, and medical services, water supplies, and sanitation were also improved. The crude death rate in 1979 was 15 per thousand, and the infant mortality rate was 42 per thousand; the crude death rate has continued to fall, reaching 8.8 in 1991, but the infant mortality rate in 1991 was 56 per thousand (Rakaseta et al. 1998:20). The Tuvalu population is youthful, with 35 percent under age fifteen, and has an unbalanced sex structure. There are slightly more females than males because of selective emigration of men as mine workers and seamen; this imbalance is most pronounced in the age group from fifteen to twenty-nine.

If current fertility and mortality rates remain constant, the population of Tuvalu will continue to grow steadily past the end of the century; unlike in other parts of Polynesia, the actual extent of population growth depends more on natural increase than on migration. Tuvalu already experiences considerable threats to national development because of its small area relative to population size (and the distribution of that population over nine small atolls at some distance from other countries). National development plans have recognized these basic constraints and have increasingly acknowledged that both a reduced rate of population growth and greater regional balance in population distribution are necessary in order to avoid a reduction in what is increasingly perceived to be an austere quality of life. A growing consensus has emerged that the rate of population growth must slow if Tuvalu is to achieve a pattern of sustainable development.

Tuvalu has sought to develop a comprehensive population policy, aimed at both fertility reduction and the slowing of rural-urban immigration to Funafuti. The need for such a policy has been expressed by former prime minister Kamuta Latasi:

Tuvalu's population growth rate of 2.5 per cent is "very alarming for us" Latasi said, and a committee has been established to conduct education tours of the country's eight [*sic*] islands. "The only way to be successful with family planning is to make people understand. If they don't understand they won't care. It's not a matter of getting on the radio and saying 'if you have five children this is what will happen!' You have to physically visit the island, get the blackboard and illustrate that if you have two metres of cloth it will cover two kids but if you have seven kids it won't." Previous opposition of church groups to family planning has changed, Latasi said, with the realisation of how serious the problem is. (*Pacific Report*, 4 April 1994, 7)

A new Population Policy Coordination Committee was established in 1993 to formulate a comprehensive national policy for outer-island development programs, population redistribution, and a means of implementing slower rates of population growth. Implementation is crucial because of the anticipated return migration of workers from Nauru when the phosphate deposits are depleted around the turn of the century, but the task is considerable:

Although a level of optional population growth is not specified, clearly a rate near replacement level would be in the national interest. This would amount to an average of less than three children per couple. . . . Two children per couple may well be in the national interest, but few couples would find it personally advantageous to have such a small family. The vast majority specifically want two children of each sex not only to give parents support in their old age, but to provide sibling support for the children themselves. (Chambers 1986:324)

There are many other reasons, including the need for strong families and some chance of access to education and employment, for having families with more than two children. Economic conditions at the village level in the outer islands favor larger families because of shared responsibilities. Establishing new directions for population change in Tuvalu will be difficult, and future population growth is likely to be considerable.

Urbanization and Migration

No country in the Pacific region has experienced more recent or more rapid internal migration and urbanization than Tuvalu. Between 1973 and 1979, the period during which Tuvalu seceded from Kiribati to become an independent state, the population of Funafuti grew from 871 to 2,120 as a result of the closure of the Banaba mine, return migration from Kiribati, and movements from the outer islands. In 1973 three other atolls had populations larger than Funafuti, but by 1979 it was unchallenged as the most important island in the new nation. Only the atoll of Vaitupu had achieved relatively rapid growth in the same time period. During the 1980s that supremacy increased, as Funafuti took on more of the trappings of a national capital and its population grew to 3,839 in 1991. It has now passed 4,000. Its proportion of the national population increased from 29 percent in 1979 to nearly half of the national total by the mid-1990s. Moreover, the population of Funafuti has increasingly become concentrated on just one island, as natural hazards have intensified urbanization. Before 1972 there were about one hundred

people living on Fongafala, the southernmost islet of Funafuti, but after Hurricane Bebe struck, most people moved to the center of Funafuti, and by 1976 Fongafala was completely uninhabited, though there has been limited subsequent return migration. Whether on Funafuti or throughout the country, decentralization is a crucial issue in national development.

The urban situation is very different from that of most other Pacific states because of the high proportion of Tuvaluans living in a single place, the very high urban population density, and the consequential difficulties in achieving adequate service provision (especially fresh water) and providing formal employment (Connell and Lea 1995). These problems have long contributed to some tension between the long-established “true owners” of Funafuti atoll and migrants from other atolls. As early as the mid-1970s, “[d]emands for restriction of entry to the capital were being expressed by women’s committees and island councils in Tuvalu: the outer islands seeking to retain active young people; Funafuti seeking to retain its separate identity” (Howard 1976:25). Since then these issues and resentments have smoldered on but have not resulted in related policy formation. Migration into Funafuti had also begun to create an “urban elite” of those who have wage jobs and government housing and are unwilling to return to their home islands, and this elite may be self-perpetuating to the detriment of the development of those remaining on the outer islands (Tuvalu 1980:35). Further migration has accentuated those problems, produced more substantial problems of overcrowding, and reduced the possibilities for developing appropriate urban-management policies.

Because it has been both recent and rapid, this urban concentration has created problems. Many of these problems are no different from those of much larger urban centers in other developing countries: overcrowding in poor housing conditions with attendant health risks, pollution from inadequate sewerage and garbage disposal, unemployment (even if disguised by sharing in extended families), the growth of uncontrolled settlements, worsened nutrition (as cash incomes are often inadequate to purchase diets based on imported foods), and some increase in crime and social disorganization. Since migrants are not always successful, they may be unable or unwilling to contribute significantly to the needs of their rural kin. These urban problems are not unique to Tuvalu or to atoll states, but the small size of the land and lagoon areas and the problems of achieving economic growth and hence generating employment or financing service provision accentuate the basic difficulties.

Emigration has long been a way of life in Tuvalu, though the first experience of migration in the mid-nineteenth century was of “blackbirding”—forced labor migration—to South America (Maude 1981). Blackbirding gave

way to more controlled movements to the plantations of Tahiti, Fiji, Hawai'i, Samoa, and Queensland. In 1900 migration to the phosphate mines at Banaba began, and there was such enthusiasm for overseas employment that British colonial authorities had to restrict the number of migrants to safeguard population numbers. Subsequently migration diversified to Nauru and elsewhere, and the number of emigrants remained high. Their remittances enabled superior house construction (at least in terms of imported "modern" materials) and changing patterns of food consumption.

By the time of the Second World War, population growth in Tuvalu had already indicated to colonial authorities that resettlement might be necessary. Two proposals to resettle Tuvaluans in the unpopulated Line Islands, two thousand kilometers to the east, and in Tonga were never implemented, the latter because of fears that the Tongan islands might eventually be needed for Tongan resettlement. However, between 1947 and 1963, a substantial number of Vaitupu islanders were resettled on Kioa, a small Fijian island (Koch 1978). Subsequently, as most Pacific island states achieved independence, the prospects for resettlement faded, and migration generally became possible only on a temporary basis.

The extent of emigration further increased after the war, particularly through continued circular labor migration to Nauru and Banaba, to the extent that in the early 1970s more than a third of all Tuvaluans were overseas. However, that proportion had fallen by the 1980s, with both the closure of the Banaba mine and the independence of Kiribati in 1979, resulting in return migration (Connell 1983:22–24). In the 1980s population pressure on resources became critical. By the end of that decade the number of migrants apparently permanently overseas was less than 5 percent of the total population. Nonetheless, in 1991 there were more than twelve hundred Tuvaluans overseas, rather more than 10 percent of the *de jure* population. The largest number of these, 735, were working on Nauru, where the phosphate mine was slowly contracting, necessitating that almost all those contract workers would ultimately have to return to Tuvalu, perhaps before the end of the century. The future of other overseas Tuvaluans—as seamen, students, or contract workers in New Zealand—is scarcely more secure. Tuvalu therefore faces the likely and perhaps imminent return of a significant proportion of its population (though short-term migration overseas will continue). Just as in the larger Polynesian countries, that return is likely to place particular pressure on the urban center, where population density and its impact on limited resources is already considerable. Since the skills learned overseas (on ships and in a mine) are of limited local value, especially in the rural sector, return migration often intensifies despondency rather than contributing to development.

Because of limited national development opportunities, those countries where international migration is now extremely important and where dependency on migration has become considerable are not only reluctant to control overseas migration but have become anxious to seek new and better opportunities. Tuvalu as well as Kiribati have not only specifically trained seamen for work overseas (alongside exporting workers to Nauru) but have requested many countries inside the Pacific and beyond to provide new opportunities for migrant labor. Such pressures have continued, despite the increased difficulties of access to metropolitan states, as the prospects for economic development have failed to improve, population density has increased, and environmental problems have become more apparent.

In parallel with Tuvalu's increased interest in international migration, there has long been a growing recognition of the relevance of migration as one solution to development problems. In a paper produced by the South Pacific Commission, an organization for technical cooperation covering all Pacific island states, it was argued, in the case of Kiribati and Tuvalu, that for both temporary and permanent migration, "with the relatively small numbers that will be involved and with the severity of their plight, assistance from other Pacific countries and from Australia and New Zealand may be considered more favourably than is generally thought" (South Pacific Commission 1982:14). Little subsequently changed, though Tuvalu gained access to the New Zealand guestworker scheme, allowing a small number of migrants access to employment in New Zealand for periods of less than a year. A subsequent review of Australian aid, which attached concern to the impending closure of the Nauru mine, gave particular emphasis to the special needs of the small states in the South Pacific. The executive summary assigned sufficient importance to the problems of Kiribati and Tuvalu to recommend measures denied to all other states except Papua New Guinea:

Kiribati with a population of 60,000 and Tuvalu with a population of 8,000 have special problems. Their remote and minute land areas are heavily populated. They depend very much on remittances from their emigrants and on foreign aid. Their long-term development prospects are discouraging. In view of structural problems which are beyond their control and beyond the reach of aid, Australia should make available limited opportunities for immigration from Kiribati and Tuvalu. (Australia 1984:8)

The review argued that Australia should "go beyond traditional ideas of aid" to provide a special immigration quota for the two countries, with which Australia hitherto had few ties (*ibid.*: 181). As in the case of an Asian Devel-

opment Bank survey that made similar suggestions involving a range of metropolitan states (Castle 1980:136), external perceptions increasingly recognized the potential role of international migration, from at least the smallest countries in the South Pacific, in contributing to development.

Other than marginally improved access to New Zealand, little changed. Metropolitan states feared that concessional migration access to one or more small states would stimulate pressures from larger states and that international migration would reduce the likelihood of successful self-reliant development initiatives. Island states, except Tuvalu, were reluctant to press for improved access, fearing that other forms of aid might then decline. In 1994 Tuvalu's prime minister stressed that his country was continuing to seek employment opportunities in Australia and that Tuvalu "would not take no for an answer" on the provision of either employment or education opportunities. Regarding those Tuvaluans who have been educated overseas: "We want them to come back, but certainly [we] cannot have everybody, even if they are graduates. There will come a time when we can only take back a portion of our population. The rest—we will have to assist them in obtaining employment overseas and we need to prepare people for when that time comes" (quoted in *Pacific Report*, 4 April 1994, 4). Despite being rebuffed, two years later the prime minister was again requesting that Australia accept a small number of Tuvaluans each year as guestworkers to relieve existing overcrowding and enable the country to cope with the return of Nauru migrant workers: "We haven't even got homes for them. These people have been there for 20 years with the Nauru Phosphate Corporation. They have no experience working in the gardens, growing taro, cutting toddy, fishing or building houses. I am sure some of them are really good tradesmen and I am sure that they can be absorbed by companies in Australia" (quoted in *Pacific Report*, 5 August 1996, 2). Once again the request was ignored. Since the early 1980s the notion of providing new international migration opportunities for small Pacific island states has been absent from external reviews, primarily a result of the recognition that there was virtually no prospect of any positive response from metropolitan states. Island states were increasingly directed to resolve their own population and development issues.

Toward the Future

The modern era has increasingly demonstrated the tyrannies of distance that have restricted contemporary development in small island states. Atolls are tiny, resource-poor, often distant from each other, and remote from substantial land masses. Atoll states consequently face a host of development

problems, often in a more accentuated form than in other island micro-states. Problems include limited skills, a small domestic market size, the high cost of imports and exports, the restricted diversity of exports, and substantial administrative costs. These disadvantages have usually led to large trade deficits, balance of payments problems, and considerable dependence on foreign aid and technical assistance. Only in the Maldives has there been any industrialization or tourism. In the South Pacific, especially in Tuvalu, both types of development are absent. Atoll states have moved rapidly into situations of extreme dependence on the outside world, primarily for aid, concessional trade, and migration opportunities. The absence of international migration opportunities comparable to those in many other island microstates, in turn, has necessitated domestic responses to the problems of achieving economic development, but with few human or natural resources the problems have been increasingly difficult to address.

Concessional trade schemes are of diminished importance in an era of increasingly free world trade, and aid from most donor nations is currently declining; in both spheres greater self-reliance and increased privatization are being thrust upon less-developed states by reluctant donors and international organizations. Where island states, like Tuvalu, are disadvantaged in their geographical location and physical characteristics and further have little trade and no strategic location to provide bargaining status, these trends are of concern. There are few prospects for significant economic growth in Tuvalu and none that are likely to be possible without some degree of external support.

Because of limited economic and social development, migration has become a way of life. The government of Tuvalu has encouraged international migration and intermittently sought improved temporary and permanent migration opportunities in metropolitan states. Elsewhere in the Pacific migration has been a common response to difficult economic circumstances, and, where political ties permit migration, flows have been substantial and the populations of some dependent territories have declined (Connell 1987; Aldrich and Connell 1998). Although this migration does constitute a brain and skill drain, the investment in human capital that it constitutes has been an essential element in household survival strategies in the absence of attractive domestic investment opportunities, and Polynesian migrants continue to remit at high levels for periods of more than twenty-five years (Connell and Brown 1995). The provision of migration opportunities thus results in significant income flows to small island states, constituting a valid form of aid in a context where conventional forms of aid have been of minimal value in stimulating economic development. However, most metropolitan states have increasingly restricted migration opportunities, while focus-

ing on skill requirements that are rarely evident in the atoll states. Indeed, the former Australian minister for Development Cooperation and Pacific Island Affairs stressed in 1993 that “it should . . . be remembered that the migration safety valve may no longer be an option in a future, more crowded world” (Gordon Bilney, quoted in Moore and Smith 1995:110). That is also the position in New Zealand and North America.

Environmental change is likely to exacerbate domestic development problems in Tuvalu, and in other atoll states, and increase the demand for emigration. In the coral atolls that constitute the Carteret Islands (Papua New Guinea), where there has been a regional sea-level rise, resettlement has transferred people onto the large island of Bougainville (Connell 1990). In other world regions, environmental problems, whether natural (including drought and volcanic eruption) or anthropogenic, have stimulated emigration (Hugo 1996; Swain 1996), and a worsened environment in Tuvalu is likely to add to existing pressures for new emigration opportunities. More adequate coastal-zone management, sustainable development, and a slowing of population growth will delay but not avert this situation. Yet the resettlement of the national population would pose ethical issues, as Tuvalu has enunciated: “there is nowhere else that can substitute for our God-given homeland of Tuvalu. The option of relocation as mooted by some countries therefore is utterly insensitive and irresponsible. . . . Ignoring our pleas will amount to nothing less than denial of our rights to exist as part of the global society and of the human race” (quoted in *Pacific News Bulletin*, December 1997, 7).

In the 1890s, when population densities were much lower than they are now, labor migration was perceived to be “the only alternative to starvation” (Macdonald 1982:53). A century later there is a growing possibility that at least some of Tuvalu’s population will become environmental refugees at some time in the next century and that metropolitan states on the fringes of the South Pacific will thus have to respond eventually to one of the most profound impacts of the accelerated greenhouse effect: the challenge to human rights.

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