The Demographic Situation in the Pacific Islands and the Maldives

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Peter Pirie

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Introduction: The Origins of Population in the Pacific

The islands of the South Pacific are spread across an oceanic expanse of 7,000 miles from New Guinea to Easter Island and 6,000 miles from New Zealand to Hawaii, and were one of the last regions of the world to receive a human population. The New Guinea group was undoubtedly the first to be inhabited and may have been involved in the migration to Australia, but presently the information is that Australoid "Papuan" peoples were in residence some 30,000 years ago. Linguistic evidence related to the Papuan languages presently extant suggest that the peoples may have "island hopped" as far east as the Santa Cruz group in the eastern Solomons. We have little knowledge of how these people lived, but there is evidence that over the ensuing centuries, they developed sophisticated horticulture and perhaps domesticated animals, notably the pig, and accumulated quite high densities in some areas, particularly the eastern highlands of New Guinea (Bellwood, 1979: 233-244). It seems likely that their marine and navigational skills were rudimentary.

This was certainly not true of the later wave of migrants—the Austronesian-speaking peoples—who moved into western Melanesia about 5,000 years ago. They appear to have been quite at home in the marine environment. In addition, they seem also to have been accomplished horticulturalists and to have carried along with them a wide variety of useful plants. They rapidly colonized the island chains of western Melanesia, established beachheads on New Guinea itself, and moved through the Solomons, New Hebrides, New Caledonia, Fiji, Tonga, and Samoa, where their earliest remains so far dated indicate a beginning of about 3,000 years ago. It is also likely that they moved into the eastern Micronesian islands (Bellwood, 1979: 295). There is evidence, from their characteristic mark—the making

of pottery of "lapita" type—often containing traded tempers of special sand, and from obsidian mined on New Britain but dispersed, probably as a trade article, at least as far as New Caledonia, that they maintained considerable internal contact and cohesion.

Based on present evidence, the dispersal of specifically Polynesian culture seems to have been first from Samoa and then from the Marquesas, where it dispersed to the other groups of eastern Polynesia (the Societies, Cooks, Mangareva) to Easter Island, Hawaii, and New Zealand.

The Effect of Foreign Contact

When the first explorers from the Atlantic began to penetrate the Pacific Ocean, they found the populations on most islands robust and usually a good deal healthier than they were themselves. Probably the major reason for this was the relative absence of environmental, contagious, or infectious diseases in the region. Most of these causes of morbidity and mortality, being of biological origin, had been greatly inhibited in their spread by the magnitude of the transoceanic distances involved in their diffusion into the Pacific Islands. In the pre-contact period, the number of diseases were progressively fewer as the distance and oceanic separation from the Pacific rim areas increased. This is a familiar pattern in the Pacific islands, affecting all biotic phenomena, so that the array diminishes as one moves east from the hearth of Southeast Asia. The pre-contact distribution of malaria illustrates this nicely.

One of the few diseases of this type to invade the Pacific Islands at all, malaria occurred only in the New Guinea, Solomons, and Vanuatu archipelagos (and not everywhere in this zone) but had not penetrated New Caledonia and Fiji, into Polynesia or Micronesia. Other environmental

diseases which accompanied the early migrants included yaws (treponemetasis), an infectious disease transmitted from moist skin surface to skin surface under conditions of high humidity characteristic of the tropical rain forests. It seems to have existed under some ecological tension in the drier areas of peripheral Polynesia and to have been entirely absent in Easter Island and New Zealand. Filariasis, a moquito-borne disease which affects the lymphatic system and leads to elephantiasis, was also noted over a wide area in the Pacific by the earliest explorers. There may have been other infectious diseases less obvious to the foreign observer, but the list of diseases introduced after alien contact, including most of those responsible for the later increase in mortality, is so comprehensive that one is left to wonder what could have been the causes of mortality beyond accident, errors associated with child rearing, and the usual degenerative diseases left to many Pacific island peoples.

Other advantages possessed by most Pacific populations were a relative abundance and variety of food, obtained both by agriculture and gathering in an unusually favorable and reliable physical environment. Hurricanes, drought, and crop failure were not unknown, and death from starvation has been recorded (e.g., Ontong Java, 1916), but these occurrences were not common.

In the early days of contact, population estimates of the total populations of various island groups were attempted by explorers such as Cook and the early missionaries. By the time the first opportunities to actually count people occurred, the local populations had been heavily impacted and in many cases, substantial declines in numbers had already taken place. In several instances, the pre-contact maximums are entirely unknown, both in size and time. In some others, however, approximations of

size are sufficiently firm to use as bases for comparison, and it is usually assumed that the maximum was coincident with first foreign contact. This is probably a more reasonable assumption for the Pacific islands than it would be for most other regions, given their fragmentation, separation, and relatively hygienic and generally favorable physical conditions, but it would not have ever been always true. It seems to be accepted that two of the marginal and last-settled groups in Polynesia—Hawaii and New Zealand—had accumulated the largest (although not the most dense) populations in the centuries since they were first populated, the best guesses being about 200,000 to 250,000 (Schmitt, 1971: 240) for the Hawaiian Islands and something in excess of 100,000 (but probably not exceeding) 150,000 for New Zealand (Pool, 1964 and Shawcross, 1970). These numbers are larger than usually supposed for other island groups in the South Pacific, with the probable exception of New Guinea for which no comparable estimation is available. They represent an average annual rate of growth of about .04% in each case, assuming even growth from initial colonization.

Other estimates of maximum pre-contact population based on archaeological, historical, and ecological grounds have been made. These include Tahiti at 35,000 (Oliver, 1974: 33), Tongatapu at 18,000 to 24,000 (Green, 1973: 72-73), and three southern Cook Islands (Rarotonga, Aitutaki, and Margaia) together at 12,500 (Bellwood, 1971: 160). These estimates, perceived to be more credible than most, have been utilized, together with the seven from Hawaii, in an exercise by Beckerman (1977: 73-79), in which they were correlated with the length of shoreline, in turn used as a surrogate for the availability of protein. Beckerman's premise is that protein, which he sees as the critical nutritional determinant and more important than the caloric staple, was consumed mainly in the form of

coconut and fish derived from the coral reef, and the supply is therefore proportional to the length of coastline. The correlation coefficient of the observed versus the predicted was surprisingly high (.967) in spite of the primitive methodology, several problems with which Beckerman freely discussed. For instance, significant sources of protein, such as pigs and chicken and some of the subsistence crops (such as taro), are omitted from the calculation. Anyone familiar with the islands utilized will be aware that as sources of key food supplies, the productivity of the shoreline will vary rather dramatically from place to place. The idea that the availability of certain types of foodstuffs, rather than the gross amounts, may limit population numbers, or at least alter the perception of the inhabitants relative to the pressure they are putting on local resources, is not new in the Pacific. Bayliss-Smith has argued that the area in which taro could be raised on some of the Polynesian atolls of the western Pacific was a limiting factor, constraining population size in the pre-contact situation (Bayliss-Smith, 1974). The limited availability of certain types of food, other than sago, which could be given to babies was seen as the major factor in the level of deliberate infanticide deemed necessary among a Sepik river group observed by Townsend (1980: 21-26).

When the Samoans were first counted, with reasonable reliability, in the 1840s (over 120 years after Roggeveen contacted them), the population was shown to be about 40,000 persons. It has been estimated, on ecological grounds, that some 350,000 persons could have been supported employing traditional subsistence agricultural techniques and utilizing the amount of land found in modern surveys to be suitable (Pirie, 1964). There is nothing to suggest that the 40,000 Samoans who embraced Christianity in the middle decades of the 19th century were a pathetic remnant of a population

nine times as large, and even less evidence that they had ever approached the millions to which they could have grown over the 3,000 years assumed for their occupation, even at the rate indicated for Hawaii and New Zealand if land resources had permitted. While some reasonably well documented depopulation occurred into the historical period, so that one may justifiably assume that some was occurring before, it is improbable that this achieved any magnitude prior to the visit of La Perouse in 1789, after which contacts became frequent and, soon, continuous. But it is difficult to justify the notion that the maximum pre-contact population of the Samoas could have much exceeded 100,000 (Pirie, 1972: 200). Using the Beckerman regression, a population of about 120,000 is indicated prior to contact.

There is little evidence for most of Melanesia that massive depopulation, on the scale well observed in some Polynesian and Micronesian cases, was widespread or characteristic of more than a few unusual instances (McArthur, 1981). The low densities observed by early explorers are assumed to have been characteristic of this region in pre-contact times.

Early Economic Systems

There is some suggestion that although apparently all the Pacific island settler groups carried with them the practice of agriculture, they may have been content at the early stages of their settlement (when densities were extremely low and feral resources very plentiful) to depend largely on a semi-nomadic hunting and gathering mode of existence. The New Zealand case is the clearest example of this situation, but a hunting and gathering mode also characterized the earliest inhabitants of New Guinea and has persisted in some areas there to the present day. In New Zealand, the Archaic Maori occupying the whole country between the first settlement

and about 1300 AD were largely a seasonally mobile people dependent upon hunting, initially birds (notably the moa) but, as the over-exploitation of this resource occurred, marine resources later became more important. There is some evidence that population decline occurred as feral resources were depleted (Simmonds, 1973). Out of this situation, apparently agriculture, based on the Andean sweet potato (kumara), became dominant and the economic advantage shifted to areas climatically favoring this crop, particularly the northern perninsula of the North Island. It was here that the Classic Maori culture developed and spread, possibly by the remembered "Fleet" canoe migrations of the 13th century, apparently due to population pressure on the land suitable for growing kumara, to other climatically appropriate areas. This did not include most of the South Island, where Archaic culture persisted until the introduction of the "white" potato after European contact (Bellwood, 1979: 381-418).

Traditional Fertility

The possibility of the retention of a hunting and gathering mode throughout the sequence of settlement in the Pacific is of some demographic interest because of the fertility characteristic associated with such cultures. Among mobile hunting and gathering bands, it has been noted that replacement is kept deliberately low and the practices of the deprecation of sexual interest, delayed marriage, abstinence in marriage, postpartum and other taboos, prolonged lactation, attempted contraception, abortion, and infanticide are employed with varying degrees of emphasis to achieve appropriate spacing. All of these practices have been observed in New Guinea among the peoples more recently contacted (Bulmer, 1971). While in the areas in which contact has been more prolonged, many of these practices

have been abandoned and forgotten, there are still sufficient remnants in several Melanesian, Micronesian, and Polynesian cultures to raise the possibility that they were previously much more general, widespread, and effective.

Against this possibility in the dispersal stages of settlement are the archaeologically supported indications of quite rapid movement of people over large areas, implying high growth rates in the period of initial settlement rather than large numbers involved in the actual migrations. The relatively rapid dispersal of the Austronesians through Melanesia to Tonga and Samoa is one case, and the apparently rapid dispersal of the Archaic Maori culture throughout New Zealand is another (Bellwood, 1979: 386).

The possibility that the peoples settling the Pacific islands traditionally manipulated their fertility levels, using the methods mentioned above, in a social environment in which close control of individual fecundity was assumed by the leaders or by group pressure, would do much to explain some of the demographic anomalies to be found among Pacific peoples. These questions include:

- Why the populations of most of the Pacific islands were so small at first contact in spite of assumed low or moderate mortality levels and periods of settlement sufficiently long and available resources sufficiently plentiful to have permitted for greater numbers to accumulate.
- Why the appraisal by many Pacific island cultures of their natural resources and the number they could support tended to be so conservative.

- Why the populations of the most recently settled but ecologically more varied and bountiful groups (i.e., Hawaii and New Zealand) grew larger than the longer settled groups over much shorter spans.

Fertility After Contact

Following contact and colonization, as the traditional social systems began to weaken, the social control over individual fecundity is likely to have weakened along with the rest of the system. By the time some interest was taken in demographic processes, high fertility was observed in most instances, in association with raised mortality. Where high fertility was not observed, it was assumed to have been lowered by "psychological factors" or by fertility-depressing disease. As health measures were introduced and mortality came under some control, usually under the beneficence of colonial administrations during the 20s, 30s, and 40s, the "true" fertility levels were to be observed. The "demographic transition" in its classic form was thought to be under way, high mortality giving way to reduced levels, population growth at increasing rates, and "traditional" high fertility persisting but, hopefully in the future, liable to reduction through "family planning."

This interpretation of fertility change and its traditional balance with coterminous mortality levels is now seen as questionable. It seems more likely that Pacific islanders have had a long history of controlling their population size in environments in which low or moderate mortality occurred and in which the supply of certain critical resources were often quickly overtaken by demographic pressure. To an extreme extent, this was likely to be true of the atolls, and it is not surprising that recent studies have identified two cases with retrospective data of good quality, Nukuoro and ~~Eufapik~~ Eauripik, where low mortality (e_0, ca. 60) and apparently

controlled fertility together appear to have resulted in population homeostasis over a long period up to the first decades of this century (Carroll, 1975 and Levin, 1976).

The Fertility Transition

While problems of inadequate data and conflicting interpretations make the question of past fertility trends difficult to resolve, the dimensions of present fertility in the Pacific island populations have yielded over the last decade to more intensive investigation, and the major characteristics are now fairly clear for most of the countries of the region.

When the first paper on the Pacific-wide demographic situation was written, this was not the case (Ward and Moran, 1959). Virtually no fertility or mortality information was provided in this paper; interest was instead focused on the intercensal rates of growth and their implications for the future. One feature noted was the high growth rates characteristic of western Polynesian populations such as Tonga and Western Samoa (both 3.3 percent annually) and also Fiji (2.9 percent), while the western Melanesian populations showed very slow growth—less than one percent annually for all of New Guinea, the Solomons, and the New Hebrides. Other territories with modest rates of growth were the Gilbert and Ellice Islands (0.9 percent annually) and New Caledonia (1.0 percent). It was observed, however, that within the next 20 years (i.e., by 1976), the rates for Melanesia were likely to increase to be comparable with the rapidly growing Polynesian populations—a forecast, the prescience of which has now been demonstrated. Rates for Papua New Guinea are currently about 2.7 percent annually, 3.4 percent for Vanuatu, and 3.5 percent for the Solomon Islands. These, together with several groups in the Trust Territory, are now the highest

natural rates of growth in the Pacific Islands. Ward and Moran were able to make this forecast on the basis of a few studies of unusually well developed communities such as the Tolai around Rabaul (Epstein, 1962) and somewhat surprisingly in the light of subsequent events, Netherlands New Guinea. They surmised from the quickening rates of development in Melanesia that these effects would spread more widely. Already a few territories showed lowered rates of growth due to outward migration. American Samoa grew only 1.0 percent annually between 1950 and 1956 due to movement to the United States, and the Cook Islanders and Niueans were moving into New Zealand in significant numbers.

Several other developments could scarcely have been foreseen. One of the most spectacular has been the transition in the former Gilbert and Ellice Islands from a low rate of growth, accelerating to a high rate in the 1960s; and as a successful family planning program was mounted, a return to more modest levels is within the 20-year period. Kiribati and Tuvalu together are presently growing at about 1.9 percent annually.

In Western Samoa, for different reasons, a transformation in growth rates occurred as increasing numbers migrated to New Zealand, American Samoa, and the United States. After attaining natural rates of growth exceeding 3.0 percent, first observed in the 1920s, the Western Samoan population slowed its growth to 2.2 percent annually between 1966 and 1971, and to only 0.7 percent between 1971 and 1976. During this time, the number of Western Samoans in New Zealand grew to over 20,000 and the number in American Samoa to around 8.000. An additional 3,000 is estimated to be in the United States. The natural rate of growth has remained quite high, at least 3.0 percent over this period.

Even in Western Samoa, however, some progress—perhaps more than would have been foreseen in 1956 by anyone knowledgable about Samoan attitudes—has been made with contraception, and something over 10 percent of all eligible women practice family planning. Some hundreds have been surgically sterilized during the past decade, surely a measure of individual desperation as opposed to cautious national policy. In other countries, results have been more impressive. In American Samoa, apparently moved by the slogan "You space your coconuts, why not your children?" (despite the fact that few American Samoans have planted a coconut for a number of years now), nearly a quarter of all eligible women are current users of contraception.

Certainly the far-reaching family planning programs of Fiji and the Gilbert and Ellice Islands had not begun and the demographic impact that can now be discerned could not have been anticipated. In terms of a regionwide fertility transition, only these countries and New Caledonia and Guam can be said to be convincingly in a transition phase, the latter two are obviously impacted heavily by their large non-Pacific islander populations, but evidence of widespread contraceptive practice in their societies has not yet been adequately sought. French Polynesia and American Samoa are also showing some unmistakable signs of an early entry, but in neither case has the process moved very far. In contrast, the Solomon Islands, the Marshalls, the Federated States of Micronesia, Papua New Guinea, and Vanuatu show little or no sign of recent downward change and in a few areas some increase could still be occurring.

It is probably true to say that everywhere in the Pacific today, contraceptive practice is known, available (albeit with some persistence required depending on where and who you are), and practiced by those who

want to. This proportion obviously varies greatly from country to country. being restricted largely to the educated elite in Papua New Guinea and the Solomons, for instance. By contrast, it would now be difficult to live in Fiji or Tuvalu, for example, without being made aware of the possibility that families may be planned and, in the opinion of government at least, should be. Information on the practice of family planning remains deficient.

Figure 1 shows the relationship between two fertility indices. The ranking for each country for which data is available in terms of the population of eligible women accepting family planning is also given. The data ~~is~~ are derived from Lucas and Ware (1981, Table 6: 309). The relationship between the rankings and the position of the country on the fertility continuum remains vague. The data for the western Melanesian countries seems especially dubious, but in other cases the lack of the expected correspondence could be related to the short durations over which family limitation has been occurring.

That efforts toward fertility reduction have met, even in the most successful cases, with much less than complete success is no secret among those interested in population matters in the Pacific. Apparently. even the most successful programs have so far failed to recruit as many as 50 percent of all eligible women to accept a contraceptive method. Plateaux seem to be as characteristic of acceptor statistics as are rapid increases, and negative reactions are a frequent feature of the appraisals by the public in many Pacific island communities. Those of us who hope for future improvement would do well to heed comments such as those by Ravuvu Asesela (1978: 31-35), for instance, whose major complaint was the insensitivity of much of the implied philosophy and overt publicity generated by family

Figure 1 Fertility Indices

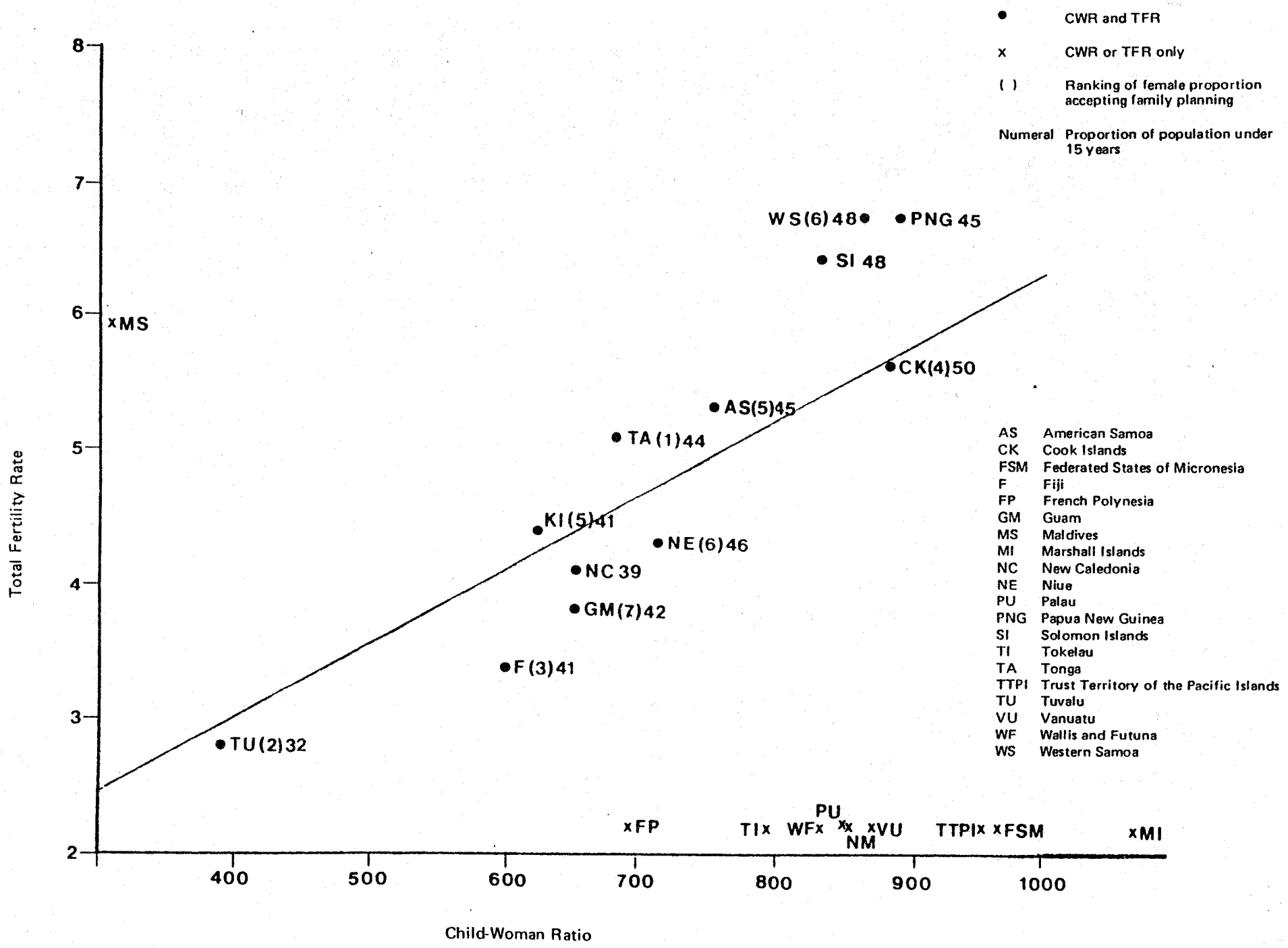


Table 1: Fertility Indices

Country	TFR for Women	Age-Specific Fertilizer Rates						
		15-19	20-24	25-29	30-34	35-39	40-44	45-49
American Samoa (1974)	5.3	55	270	340	197	132	56	12
Cook Islands (1973)	5.6	108	366	266	182	135	63	-
Fiji (1978)								
Fijians	3.3	38	189	190	125	86	28	-
Indians	3.3	61	236	196	100	44	14	-
French Polynesia (1969/71)	5.6	105	290	281	219	151	70	9
Guam (1977)	3.8	72	234	213	147	71	24	1
Kiribati (1978)	4.4	61	213	208	190	135	55	12
Nauru	-	-	-	-	-	-	-	-
New Caledonia (1975-77)	4.1	92	248	203	140	88	37	4
Niue (1976)	4.3	121	259	225	188	72	26	3
Papua New Guinea (1971)	6.7	75	296	312	270	202	120	67
Pitcairn Islands	-	-	-	-	-	-	-	-
Solomon Islands (1970)	6.4	66	247	298	279	221	124	37
Tokelau	-	-	-	-	-	-	-	-
Tonga (1976)	5.1	-	-	-	-	-	-	-
Trust Territory of the Pacific Islands (1978)	4.6	-	-	-	-	-	-	-
Tuvalu (1979)	2.8	27	139	159	144	68	22	1
Vanuatu	-	-	-	-	-	-	-	-
Wallis and Futuna	-	-	-	-	-	-	-	-
Wetern Samoa (1976)	6.7	55	272	355	320	219	101	20
Maldives (1967)	5.9	131	294	276	235	182	95	15

planning programs, including that of Fiji, the oldest and one of the most successful, without necessarily dismissing the legitimacy of the ultimate aim.

The Mortality Transition

The authorities responsible for the health and public hygiene of the Pacific islands population have had a long history of success and widespread public approval and acceptance of their work. Although it remains true that in many Pacific island societies traditional medicine retains a place and the prospect of attending a clinic, being examined by a doctor, or being confined to a hospital is one full of alien and terrifying possibilities to many (particularly the old in more isolated communities), the hegemony of western medicine is almost complete. The benefits of antibiotics, anti-malarial measures, and the ability to save and preserve newborn lives has been too obvious to overlook, and the doctor and nurse have taken a respected place even within the most traditional hierarchies. In the process, the proximate determinants of mortality have been transformed.

Cause of death statistics for three American territories illustrate this (Table 2). Degenerative diseases are the principal cause of death in Guam (49 percent) but are responsible for only about 26 percent in the Trust Territory, with American Samoa showing an intermediate level of 42 percent. This sequence is reversed for the environmentally-related causes of death, which are about six times as common in the TTPI as they are in Guam. Deaths of a violent and accidental nature, however, are 14 percent in Guam, 13 percent in American Samoa, and decline to 8 percent in the TTPI, descending in order relative to the degree of "modernization." A

Table 2: Proportion of Deaths by Cause (percent)

	Trust Territory of the Pacific Islands (1977-1979)	American Samoa (1974-1976)	Guam (1980)
Heart	9	22	22
Cancer	10	10	15
Cerebro-vascular	4	9	9
Diabetes/cirrhosis	3	1	3
Other	-	-	-
Degenerative: subtotal	26	42	49
Influenza/pneumonia	7	2	-
Bronchitis/emphysema	5	-	-
Nutritional deficiencies	3	-	-
Diarrhea/intestinal	11	-	-
T.B./meningitis	3	2	-
causes related to infancy	9	10	6
Environmental: subtotal	38	14	6
Traffic accidents	-	-	-
Other accidents	-	-	-
Murder	-	-	-
Violence: subtotal	8	13	14
Others and unknown:	27	30	31

Figure 2 | ortality: Expectation of Life at Birth (e_0)

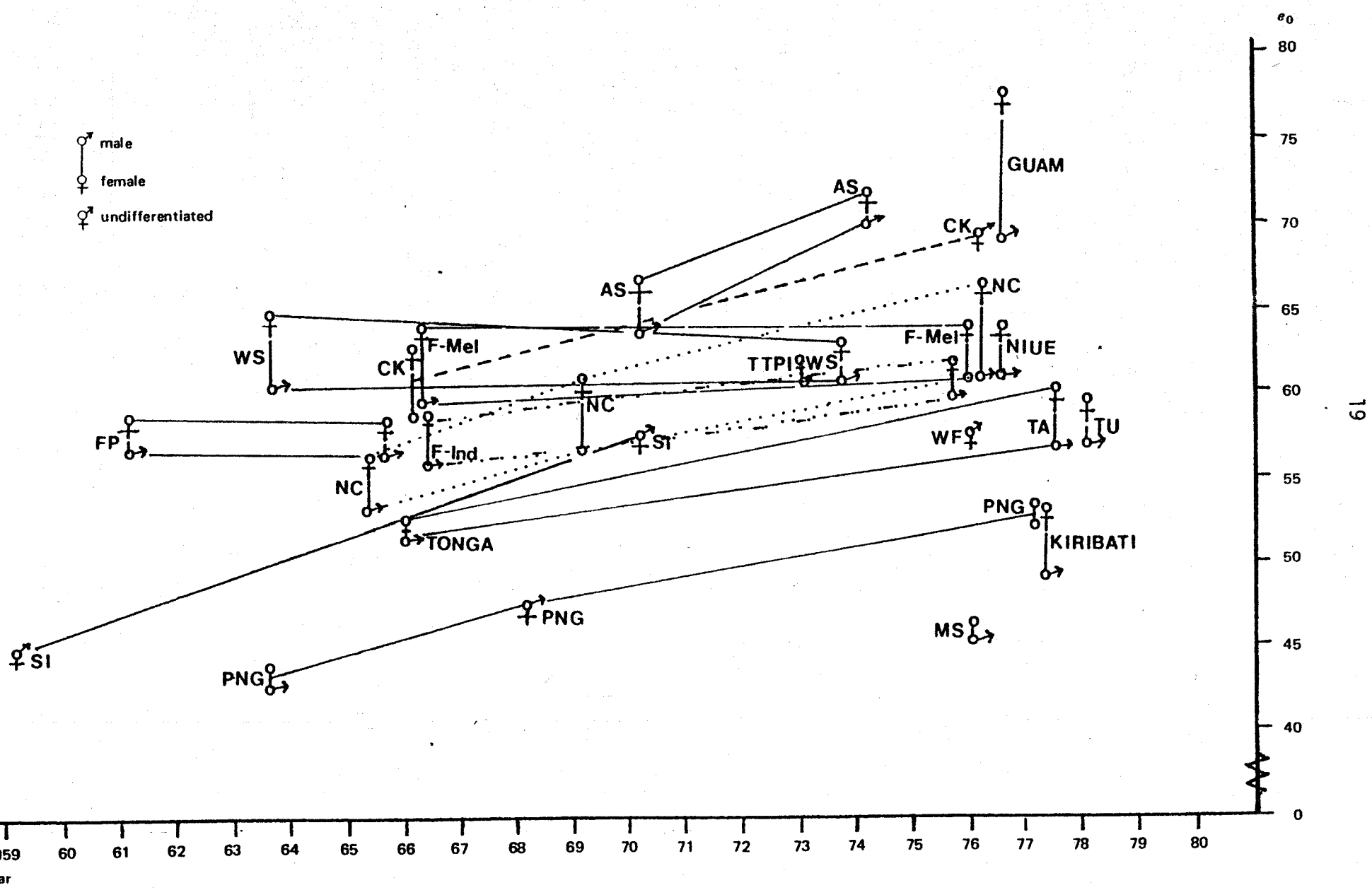


Table 3: Mortality Indices

Country	E_o M	P	F	Year
American Samoa	65	-	70	1971-73
Cook Islands	-	70	-	1976
Fiji				
Melanesian	61	-	64	1976
Indian	60	-	62	1976
French Polynesia	58	-	61	1964-71
Guam	72	-	79	1976-77
Kiribati	50	-	54	1978
Nauru	-	-	-	-
New Caledonia	61	-	67	1976
Niue	61	-	64	1976
Papua New Guinea	53	-	54	1978
Pitcairn Island	-	-	-	-
Solomon Islands	-	58	-	1970
Tokelau	-	-	-	-
Tonga	57	-	61	1976-80
Trust Territory of the Pacific Islands	61	-	62	1973
Tuvalu	57	-	60	1979
Vanuatu	-	-	-	-
Wallis and Futuna	-	59	0	1976
Western Samoa	61	-	64	1971-76
Maldives	46	-	47	1978

measure of the degree to which mortality remains poorly monitored, even in the more lavishly administered areas, is the proportion of causes of death still vaguely defined or not recorded at all. in these cases between a quarter and a third of the whole. For many Pacific island countries, data of this kind are not collected on a comprehensive basis and for several others, it is available in such an incomplete form as to be virtually useless for statistical purposes.

As medical and environmental conditions continue to improve, they are reflected in the mortality indices for Pacific island populations. Expectation of life figures are available for many countries, and although they should be used with caution, being based sometimes on estimates of varying reliability or on data subject to under-registration (leading to somewhat over-optimistic results), they nevertheless show an encouraging level and trend (Figure 2). This remains true in spite of a tendency obvious in several recently independent countries to devote a lower proportion of their national income to public health than the colonial regimes usually did. Several of these governments seem to believe that more intensive development in health is of lower priority than improvements in infrastructure, economic development projects and education, given the relatively favorable levels already achieved. The situation whereby environmental diseases are not completely controlled but are brought down to tolerable levels, in which mortality among infants remains several times the levels demonstrated to be technically possible, and in which the diseases requiring costly and complex methods of diagnosis and treatment have to be neglected, is likely to persist even in the more developed Pacific Island countries for some time to come.

In terms of demographic transition, it is virtually certain now that all the Pacific island countries will continue to bring mortality under increasing control and that the practice of controlling fertility, well established in several island groups, will intensify and spread so that over the next 20 years, for instance, we are likely to see a transformation in levels perhaps no less fundamental than in the last two decades.

Changes in Population Structure

The changing levels of mortality and fertility of great intrinsic importance themselves are also powerful agents in the alteration of other population characteristics. Ideally. each age and sex group in a society should be replaced, when its time comes to move up the profile, by another of a size as similar to, if a little larger than, its predecessor. This is a sign of a stable society in equilibrium, its internal processes operating smoothly and predictably. While in traditional societies in the Pacific this would normally have been the case, since foreign contact the disruption of these processes has caused many instances of age and sex imbalance to develop. In the first phase of the transition, proportions at the lower levels of the profile became enlarged as numbers born per woman increased and greater proportions survived. The broadly-based pyramid, often to the extent that almost half the total population was under fifteen years old, became a characteristic of Pacific island populations. For several countries such as the Solomon Islands (48 percent), the TTPI (46 percent), Vanuatu (46 percent), and Papua New Guinea (45 percent), it still is. But others have moved into a different phase whereby. while the size of the teenage and young adult age groups are inflated, within the profile they are supported by lesser proportions in the youngest age groups as a

result of recent declines in fertility. Meanwhile, the bulge in the profile related to the teenage and young adult age groups is moving through much like a goat swallowed by a python, placing heavy strains on education and land systems, job markets, and the social fabric generally.

Another variety of structure has also become characteristic of several Pacific populations whose internal balance hasbeen disrupted by age and sex selective international migration. Niue is the extreme example, but the Cook Islands, Tokelau, and Western Samoa are also affected in this way. Internal redistribution is also having a similar effect in some countries. The "deserted village" is becoming a feature of the more inaccessible parts of the Pacific, waiting for some local Goldsmith to lament its passing. There is an important difference to be noted here: the English peasant was dispossessed of traditional land rights by a system of enclosing estates as private property. Land alienation is not now occurring on any scale in the Pacific. Migrants are leaving voluntarily. moved by comparing what they know in the rural village with what they see and hear, through relatives and the mass media, of the world beyond; often the movements are of a peculiarly "Pacific" kind, designed to retain the best of both worlds.

Also, Tonga

Define.

Urbanization

The most successful of the institutions introduced by foreign agencies in the Pacific today is probably the urban center. From small beginnings, around an anchorage perhaps, a Christian mission, a store or two, the Pacific island town has truly come of age in recent decades. In the beginning, the town was largely an alien place to the indigenous people, to be visited perhaps but scarcely to be lived in, with the possible exception of those unfortunate enough to belong to villages which the town engulfed in

the course of its growth. It was inhabited rather by alien groups, Europeans, Chinese, Indians, people of mixed race, or from other island groups, or those who were "different" in some way—the small educated elite, the speakers of the foreign language, the mission-sponsored, those who provided a bridge between the alien and the indigenous, the "marginal people" of the Pacific. Over recent decades, more and more the town has developed into an authentic alternative to the village settlement for many Pacific islanders—a creature of its hinterland rather than the beachhead of an invading group (Table 4).

Most of the earliest towns in the Pacific have grown and prospered. The earliest, Papeete, is now a city spread along the coast covering several suburbs with a total of over 60,000 people. The largest, Port Moresby, was counted as 122,761 in 1980, a sustained growth rate of 8.0 percent since 1966, when it showed only about 62,000. Of only a few, Levuka, Fiji is probably the outstanding example of an old town that is backwatered and actually declining (-7.9 percent, 1966-1976). Papua New Guinea shows almost explosive urban growth. Port Moresby. although the largest center, is by no means the fastest growing. This description today belongs to Kieta, probably the fastest growing urban area in the Pacific (26 percent annually. 1966-1980). From a sleepy district center on Bougainville with fewer than 800 persons, it has been transformed as a result of the development of the copper mine at nearby Panguna into the fourth largest urban area in Papua New Guinea (19,555 in 1980). Kieta spreads inland to the mine site and along the coast to include the airport area, a new port, and the housing developments at Arawa. Lae, the second city, Mt. Hagen, and Goroka are also growing rapidly, all with a 10 percent annual growth rate since 1966. Of the larger centers, only Rabaul is

Table 4: Urban Areas in the Pacific, Ranked by Size (over 10,000 only)

Urban Area	Population	Year	Country
Port Moresby	122,761	1980	Papua New Guinea
Suva	117,827	1976	Fiji
Agana	105,821	1980	Guam
Lae	61,682	1980	Papua New Guinea
Papeete	59,727	1977	French Polynesia
Noumea	59,052	1974	New Caledonia
Apia	32,099	1976	Western Samoa
Lautoka	28,847	1976	Fiji
Madang	21,332	1980	Papua New Guinea
Kieta	19,555	1980	Papua New Guinea
Wewak	19,554	1980	Papua New Guinea
Goroka	18,797	1980	Papua New Guinea
Honiara	18,346	1979	Solomon Islands
Nukualofa	18,312	1976	Tonga
Tarawa (Sth)	17,921	1978	Kiribati
Port Vila	15,088	1976	Vanuatu
Rabaul	14,973	1980	Papua New Guinea
Saipan	14,585	1980	Northern Marianas
Mt. Hagen	13,642	1980	Papua New Guinea
Labasa	12,996	1976	Fiji
Nadi	12,995	1976	Fiji
Pago Pago	11,399	1980	American Samoa
Moen	10,373	1980	Federated States of Micronesia

showing signs of constricted growth. Since 1966, it has grown at a rate of only 2.5 percent annually. which is probably somewhat less than natural growth. Overall. urban growth in Papua New Guinea has averaged 10 percent annually since 1966, an exceptional (and unsustainable) rate, such that during this time the proportion living in urban areas changed from no more than 4.8 percent to about 13 percent in 1980. This proportion is still very low by world standards or by those of more mature urban systems in other countries of the Pacific, and must represent an early "catch-up" phase.

In Fiji, by contrast, the urban area of Suva—long the largest in the Pacific islands, although overtaken by Port Moresby—still shows very robust growth at 3.9 percent annually from 1966 to 1976. At about 118,000 persons, it is a mature, well developed city which dominates the political, economic, and social life of the country in a way familiar to anyone who knows the "primate" cities of the world. Although it has regional functions as well as purely national ones, the potential of its hinterland areas do not compare with that of Port Moresby which will surely continue to grow much faster in the foreseeable future. The proportion of the Fiji population living in urban areas, 37 percent overall, is fairly high by the standards of other agriculturally-based LDCs. Among Fijians, the indigenous group, the level is somewhat less, 31 percent, but their rate of growth is more rapid than other groups, notably the Indians.

There is a group of Pacific island towns which have been affected in recent years by slow growth or actual decline related to the possibilities of emigration to a metropolitan country. Avarua, the capital of the Cook Islands, is the best example; Alofi, capital of Niue, is another. Apia, the capital of Western Samoa, has also been suppressed in its growth by the

propensity of Samoans to urbanize in New Zealand rather than in their own country. Just over 30,000 in 1976, Apia has grown at a rate of only 2.3 percent since 1966 (below natural increase), and the proportion of the population living in town is still only just over 20 percent. If the groups living in New Zealand, the United States, and American Samoa are included in the proportion of Western Samoans who are urbanized, they would be 34 percent of the whole. This proportion is larger but still only of the order of magnitude found among the Fijians and the Kiribati at home, for instance. Pago Pago would have experienced a similar trend had it not been for the influx of Western Samoans responding to the availability of employment openings in the fish canneries and the growth related to expanding government and commerce.

Another type of urban development has evolved in some of the more affluent islands. In these cases, the urban populations have to be defined less by their presence in a definable town than by the virtual absence of rural population. Nauru is the outstanding example related to its small size, the demise of agriculture, and the economic dominance of phosphate mining. Guam and Saipan, Mariana Islands, have developed along similar lines, with urban development dispersed rather thinly in many areas over virtually the whole island. The areas not definably urban are instead unused; certainly they are not taken up in any serious way for agriculture.

The neglect of agriculture is characteristic wherever more lavishly financed administrations occur throughout the Pacific, although in the larger territories, the trend has not reached its ultimate conclusion. In the United States-administered areas, the inflow of federal funds often in programs evolved in Washington to alleviate problems identified as impeding the development of the "Great Society" but applied indiscriminately to the

Pacific territories, most of whose populations qualify as "deprived" if mainland standards are used, have certainly had this effect. Guam. the Northern Marianas, and American Samoa have been especially impacted and the Trust Territory is catching up fast. The French territories, New Caledonia and French Polynesia, have been similary affected by the inflow of capital and assistance, so that the alternative of agricultural employment, even self-employment, is seen to be inferior in economic possibilities to wage-earning in the urban, mining, and industrial sectors of the economy. All of these territories, U.S. and French, import much of their food, usually at greater cost than the income received from their agricultural exports, if any.

The urban area of Noumea now contains nearly 60 percent of the total population of New Caledonia, while 57 percent of the French Polynesian population now lives in the Papeete area.

The effect of the New Zealand connection on the Cook Islands, Niue, and the Tokelau Islands has been similar, while only the relatively massive size of Papua New Guinea, which receives the largest amount of external support, has saved it from joining the ranks of the economically dependent. The formerly British territories have received the least attention of this kind and tend to be less economically vulnerable (Hamnett, et al., 1981: 6-12).

The declining interest in agriculture is reflected in the numbers employed and in declining or static production, which is now a widespread characteristic of the Pacific island region. Only 29 percent of the value of exports is now derived from traditional agricultural crops and the most widespread, coconut products, comprise less than 8 percent within that total. Problems with data are acute in describing employment in the

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Pacific islands, particularly related to traditional forms of agriculture, but some idea of what can happen in rapidly developing territories can be gained from the case of American Samoa, which in 1960 showed a proportion of 28 percent (of those over 15 years) engaged in agriculture. By 1974, the equivalent proportion was down to 3 percent, a reflection of the fact that agricultural activity with any pretensions toward commercial intent had virtually ceased on Tutuila, although for lack of better opportunity some customary agriculture was still practiced in the Manu'a group. This is in rather dramatic contrast to Western Samoa, where some 61 of those employed were still in agriculture in 1976, mainly customary agriculture, one of the highest rates in the Pacific region. Even in Fiji where agricultural activity, much of it commercial and technologically sophisticated, has long been the mainstay of the economy and still is, there was a fall from 54 percent of the economically active population in 1966 engaged in agriculture to only 44 percent in 1976. The dramatic increases have not been in the mining or manufacturing sectors, but in services, trade, and industries like transportation and construction. The trend seems to be a rapid transformation from economies dominated by subsistence and peasant agriculture to essentially post-industrial types with no intervening stages.

Conclusion

Change and variety characterize the populations of the Pacific islands now as they have in the past. Change over the last 20 years has been rapid and some truly astonishing transformations have occurred during this time. There is little to suggest that the next two decades will show a slowing of the processes involved.

The problems of monitoring these changes have been reduced over this period as the capability of gathering and handling the amounts of data required has been eased by the dramatic dispersal of data-processing technology. The costs of taking censuses, mounting supplementary surveys, and of improving vital statistics systems are becoming burdensome, and it is only the external assistance that many Pacific island countries receive which allows them to continue at the scale established over the last few years. Problems of continuity, comparability, and regional standardization persist undiminished.

Over the next decade, research on population matters in the Pacific islands will continue to be necessary and will still need to focus on the basic demographic processes. Although significant progress has been made, there are still many gaps and anomalies in the data on fertility and mortality for the majority of the political units. Research into migration flows is only recently receiving sufficient attention, and this will need to continue into the foreseeable future. The less basic areas of demography such as morbidity, nuptiality, and labor force are even less well supplied with appropriate data. There exists a need for other countries in the region to have World Fertility-Life surveys such as that done in Fiji. Other areas of research directed toward widening and deepening the knowledge of population needed for appropriate planning include:

- Investigation of the interactions of population and economic development.
- The causes of rural depopulation and the appropriate ways in which this can be either accommodated or reversed.
- Studies in family planning; methods, appropriate policies, and evaluation of programs.

- Studies on the value of children in Pacific island communities. The work of Bulatao (1979) indicates that a transition is occurring in the perception parents have of children in many developing countries. No work in this area has so far been attempted in the Pacific islands.
- Intergenerational obligation flow studies are needed to test the validity of the Caldwell theory of demographic transition.
- The Pacific island family as a demographic unit requires much more study than it has received.
- The urban poor, including squatter communities in some cities, are becoming sufficiently numerous and enough of a problem to justify some attention to their socio-demographic characteristics.

This list could obviously be expanded, but is sufficient to indicate that the tasks of population research are far from over, and that the needs are multiplying and becoming more complex rather than diminishing.

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THE DEMOGRAPHIC TRANSITION IN THE PACIFIC ISLANDS

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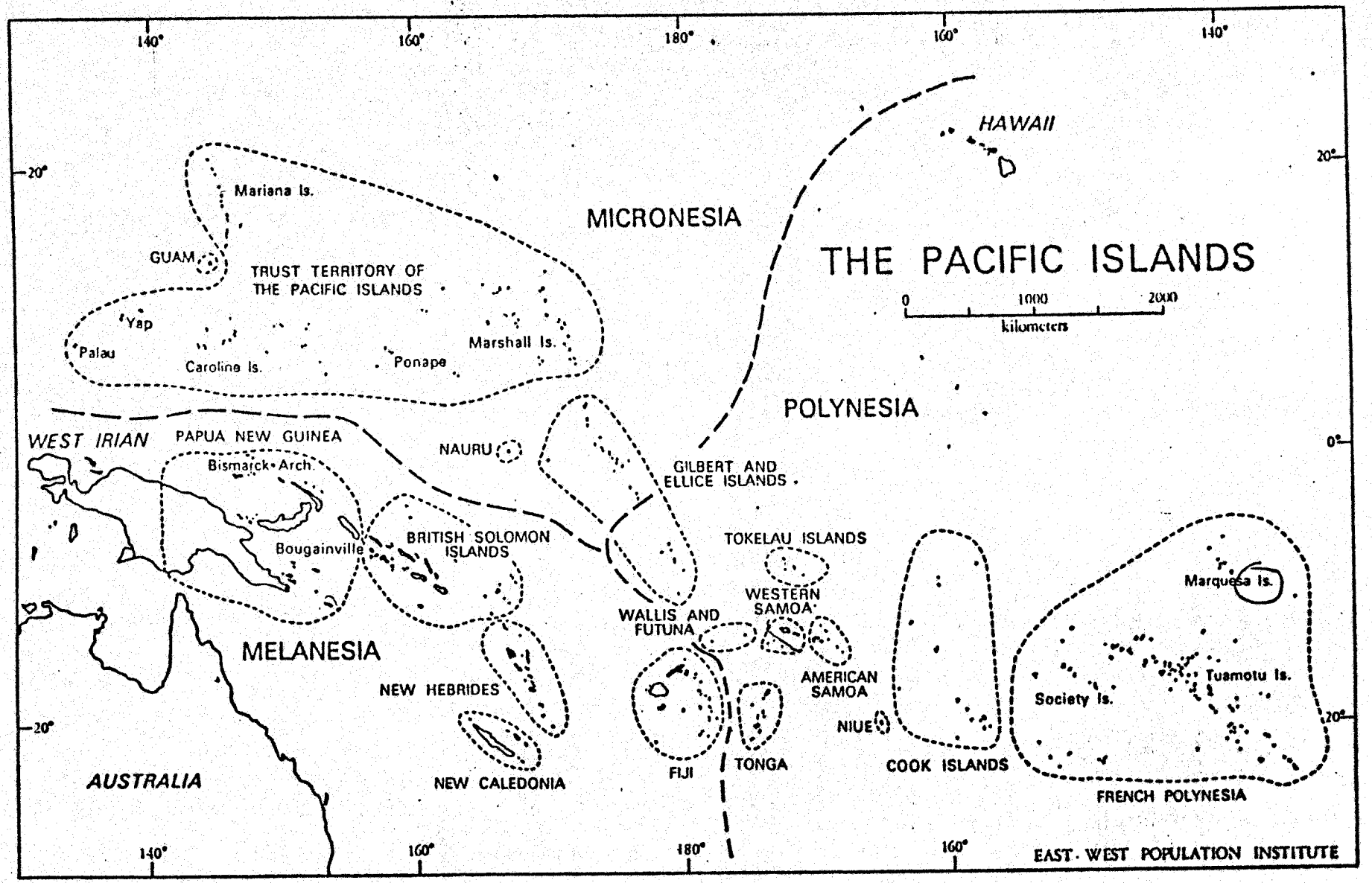
Peter Pirie

Of all the world's environments those of the islands in the tropical Pacific Ocean offer the least obstacle to the perpetuation of human life. Their scattered distribution, their varied forms and their unique histories contribute to a diverse forum in which the working of social and economic processes can be studied with a precision and clinical isolation scarcely matched in other research locations. These advantages have been eagerly utilized by many working in the life sciences, and among the social sciences, notably anthropologists. The region is seen here as offering no less a laboratory for demographers attempting to understand the complex relationships which determine the workings of vital processes. This paper will review the Demographic Transition theory as it is seen to apply to the demographic histories of the various island groups.

The region discussed includes Melanesia, Polynesia, and Micronesia. There are 18 governed units in the region, omitting Hawaii, New Zealand, Irian Jaya and Easter Island, of which 7 are small independent nations, the rest representing a persistence of that vanishing political form, the colonial dependency. (Fig. 1) They vary in population size from newly-independent Papua New Guinea at c2,490,000 (1971), which has never been properly censused, to the Tokelau Island c1,600 (1972). This degree of variation applies to other demographic variables too, and to the local response to the external forces which affect the balance between mortality and fertility.

The region was one of the last in the world to become inhabited, with the more peripheral groups having spans from first settlement to the present of less than two thousand years, the Marquesas for instance has thrown up carbon-dated evidence of settlement of c400 AD, New Guinea, although the evidence is fragmentary, shows little evidence of having a longer period than c23,000 years. When explorers from the Atlantic began to penetrate the Pacific Ocean they found the populations on most islands robust and usually a good deal healthier than they were themselves. The major reason for this was the relative absence of environmental and contagious or infectious disease in the region. The earliest explorers described yaws (treponematosis) an infectious disease transmitted from moist skin surface to skin surface under conditions of high humidity, characteristic of the tropical rain forests. Filariasis, a mosquito-borne disease which affects the lymphatic system, leading to elephantiasis, was also noted as endemic in early accounts. In the islands groups of Western Melanesia, New Guinea, most of the Solomons and the New Hebrides (but not New Caledonia or Fiji) were affected by malaria, to an extent which puts them in a class different from the rest of the Pacific when mortality risk is discussed. For the rest however, diseases of biological origin had been greatly inhibited in their spread by the magnitude of the trans-oceanic distances so that in the pre-historic period, the number of diseases were progressively fewer as the distance and oceanic separation from the Pacific rim areas increased. This is a familiar pattern in the Pacific islands, affecting all biotic phenomena, so that the array diminishes as one moves east from the hearth of South-east Asia.

FIG. 1


THE PACIFIC ISLANDS
0 1000 2000
kilometers
140°
160°
180°
160°
140°
20°
0°
HAWAII
MICRONESIA
Mariana Is.
GUAM
TRUST TERRITORY OF THE PACIFIC ISLANDS
Yap
Palau
Caroline Is.
Ponape
Marshall Is.
POLYNESIA
WEST IRIAN
PAPUA NEW GUINEA
Bismarck Arch.
Bougainville
NAURU
GILBERT AND ELLICE ISLANDS
BRITISH SOLOMON ISLANDS
TOKELAU ISLANDS
WESTERN SAMOA
WALLIS AND FUTUNA
AMERICAN SAMOA
MELANESIA
NEW HEBRIDES
NIUE
Marquesa Is.
Society Is.
Tuamotu Is.
AUSTRALIA
NEW CALEDONIA
FIJI
TONGA
COOK ISLANDS
FRENCH POLYNESIA
EAST-WEST POPULATION INSTITUTE

Most of the major diseases responsible for later increases in mortality, some of them disastrous, were introduced; in the list are tuberculosis, dysentery, influenza, small-pox, typhoid, cholera and several "childhood" diseases which had a lethal effect on non-immune peoples, such as measles, whooping-cough and diptheria. The list of diseases introduced after alien contact is so comprehensive that one is left to wonder what causes of mortality, beyond accident, errors associated with childrearing and the usual degenerative diseases were left to many Pacific island peoples.

The early migrants arrived in the islands with well developed neolithic cultures including an array of agricultural techniques, food plants, some domesticated animals, and well developed technology in several areas, notably navigation, but including also fishing, pottery, weaving, housebuilding and food preservation. While the islands were vulnerable to some freak weather conditions, notably typhoons in the Western Pacific, the climates were on the whole benign and reliable so that harvest failures probably had less effect than in most other parts of the world. With these advantages it might be expected that population growth would be rapid after first settlement, with relatively low mortality levels, and the high fertility associated with traditional or peasant agricultural societies. On discovery they should, by this model, have shown high population densities within their narrowly bounded habitants and to have shown evidence of the generally accepted biological theory that populations will tend to multiply up to the point of balance of equilibrium with the energy sources available in their domains. The occurrence of long-phase ecological cycles, wherein population numbers mounted, were cut by increased mortality or outward migration and mounted again, should have been in evidence.

The case of Western Samoa, for instance, would indicate that, over a span of at least 2,500 years, even at quite modest rates of growth (i.e. below 0.5% annually) on a base of three to four hundred persons the population could easily have grown beyond the 350,000 persons it is estimated, on ecological grounds, could have been supported without resource strain employing traditional Polynesian agricultural techniques. There is little evidence to show that this ever occurred, and considerable indication that it did not. Although the first counts of the Samoan population were not made until the 1840's, after first contact in 1722, these showed a population in the vicinity of 40,000 persons, with little suggestion that this was a pathetic remnant of one eight times as large. Some reasonably well-documented depopulation occurred into the historical period, so that it is reasonable to assume that some was occurring before — but it is improbable that this achieved any magnitude prior to the visit of La Perouse in 1789. From this time contacts became frequent and soon continuous. It is improbable that the maximum population in Samoa ever exceeded 100,000 persons (Pirie, 1962: 200). Tonga and Fiji show similar patterns. The cases of the Maori in New Zealand and the Hawaiians are somewhat different: although the period of settlement was half as long, the population in each case developed more rapidly, to about 300,000 in the case of Hawaii and 250,000 in New Zealand. The ecological conditions in both were somewhat more adverse than in the central Pacific islands but the total area available and the diversity of environment was in each case much greater. In the Marquesas, a major dispersal center in Eastern Polynesia, some evidence of population pressure has been noted, the later establishment of settlements in the drought-prone valleys of the lee sides of the islands and up the slopes of valley sides away from the water sources and the rich

bottom lands of the valley floors, but it is unlikely that their total population ever exceeded 100,000 persons which is considerably below their maximum "carrying capacity" (Suggs, 1965).

Most Pacific island cultures were content with a fairly casual level of resource utilization, and there are few examples of agricultural intensities such as occurred contemporarily in the lands of the Asian-Pacific rim. Their economies were of the type which has come to be described as "subsistence affluence" and there is little evidence of local innovation in response to increasing population pressure which one could expect had the hypothesis of intensification been operating (Boserup, 1965).

The point of this brief review of the existing knowledge about the pre-historic populations in the Pacific Islands, is to indicate that as a base for illustrating the conventional model of the demographic transition, the Pacific Island populations leave something to be desired. The high and fluctuating death rates observed in continental areas, notably in Europe where better documentation led to the development of this aspect of demographic transition theory, were probably not characteristic of pre-contact populations in the Pacific islands. If this is true however, why is it that the rates of population growth were apparently so modest? Was mortality much higher than supposed due to causes not yet discovered? Were population densities much higher than shown by the remaining evidence, and then reduced by causes prior to the establishment of continuous contact, notably the missionaries who made the first counts, but who failed to note the history and causes of decline? These questions have been posed before, (Pirie 1964, and 1973: 6-7).

Recent research has turned up one possible answer not originally considered: that fertility was not as high as has been assumed in the

pre-contact era, and in many Pacific societies was kept closely in phase with the prevailing moderate levels of mortality. Restraint in many Melanesian societies particularly in Papua New Guinea has been noted already in the literature (Bulmer 1971; Ogan, Nash and Mitchell n.d.; Chapman and Pirie 1974). Bulmer's work included a synthesis of the evidence for voluntary fertility control in a number of New Guinea societies and found none that did not, at least traditionally, have cultural norms that reduced fertility.

The post-partum taboo appears to have occurred in virtually all New Guinea societies, varying in length but exceeding four years in some instances. Two and three years was common. Delay in resuming marital sex until the mother weaned the youngest child was usual, and this frequently did not occur until the child was two or three years old. Also given frequently as a yardstick for determining when intercourse could be resumed was the ability of the youngest child to walk competently along the tracks separating the houses from the gardens. These restrictions were obviously related to the mother's role as an agriculturalist. The difficulty of performing essential economic tasks and at the same time caring for several young children, notably feeding and carrying them about is the obvious functional reason. Males in these societies in most cases traditionally limited themselves to providing protection and administration, and participated in the gardening process only in very heavy work such as clearing new forest land. The hand that carried the spear seldom rocked the cradle, and was never seen in public tending to children's needs.

A frequent male attitude to sexual activity may also have played some part in lowering fertility; in many Melanesian societies sexual

activity was seen as debilitating, polluting, or as requiring undue effort. Sex was very often avoided or proscribed before or during certain tasks or special occasions or seasons.

Although usually described in the literature as a taboo, implying a supernatural element in the sanction, the Melanesian explanations for the injunction seldom invoke anything but rational, matter-of-fact reasons for their actions in fertility limitation. The enforcement mechanism was mainly guilt or fear, particularly of harming the youngest child, causing it to be weak and sickly, or polluting the mothers' milk, rather than any supernatural retribution. The anxieties of the parents were reinforced by the disapproving gossip of their fellow villagers if it became known that they had resumed intercourse or if the mother became pregnant again with what was thought to be unseemly haste. In many societies the males, at the birth of his child, began again to sleep in the "men's house" or took the opportunity to go away on wage-labor contracts or to visit other places away from his family.

Marriages were not particularly early. Males were expected first to establish their competence in the manly skills, usually in their early twenties while the female was considered ready somewhat earlier, but few had their first child before age 20. Restrictions on marriage eligibility, such as exogamy, also caused delays in many instances beyond the attainment of social eligibility.

In several societies there were institutionalized mechanisms for reducing the frustrations of males subjected to these limitations on sexual activity. The stress on total abstinence during a high proporation of the marital span was offset to a degree by sanctioned polygamy, prostitution and homosexuality in many instances (Davenport, 1965).

In addition to these social devices, resort was also made to contraceptive practices, for instance the ingestion of herbs, bark or special juices and other natural substances obtained from the tropical forests. The efficacy of these substances has not been substantiated, and in one instance where a selection was biochemically tested the indications were that they would be ineffective (Scragg, 1957). But the intention to avoid pregnancy by chemical means was widespread throughout Melanesia, and considerable faith is still maintained in many of these methods.

Coitus interruptus and vaginal insertion of substances believed to be contraceptive has been reported, but only for relatively few societies (Bulmer, 1971: 151).

Much more common is abortion which appears to be relatively well-known and frequently practised in most Melanesian societies (Bulmer, 1971: 153 and Chapman and Pirie, 1974: 4-13). While not socially condoned, unwanted pregnancies, particularly among unmarried girls, were terminated in this way by a variety of methods, such as placing hot stones on the abdomen, heavy massage, custom medicine and magic.

Infanticide was also not uncommon throughout Melanesia, but usually for reasons such as physical deformity, multiple births, where only one, often a male, would be permitted to survive, illegitimacy or family hardship, as in times of famine.

It is apparent from this account that a very high proportion of the known methods to limit fertility were used in Melanesia and that usually their use was conscious, purposive and could usually be articulated rationally by the parties involved. Decisions to smother a new-born baby, induce an abortion or avoid becoming pregnant were deliberate and were made with specific and well perceived stimuli. The emphasis was usually

on spacing rather than on small family size in total. Levels of usage of the various methods will have varied between cultures, and also over time in response to changes in the economic, social and health environment of which they were a part. Economic pressures were particularly important in determining the local societies perception of acceptable attitudes toward fertility by individuals and toward levels of replacement by the larger group.

Given this situation, the low levels of fertility observed in some Melanesian societies at the time of or soon after European contact are not surprising. The Chimbu, a society among the more densely packed in the New Guinea highland valleys, and not contacted until 1933, showed quite low fertility levels. Women of 46 years or over each reported a mean of only 2.3 children surviving for a year or more; even in 1962 their crude birthrate was only 28 per thousand (Brown and Winefield, 1965: 181).

Allowing an average five-year birth interval beginning at 21 years, about normal for many Melanesian societies, and allowing for a gradually widening interval, as natural fertility declines in the late thirties and early forties, the indication is that the maximum sized family

FIGURE 2

1st	2nd	3rd	4th	5th child
1 < 5 yrs. >	1 < 5 yrs. >	1 < 6 yrs.	1 < 7 yrs. >	1
21 yrs.	26 yrs.	31 yrs.	37 yrs.	44 yrs.

would be approximately 5 children (see Figure 2). Obviously many women, for a variety of reasons, would fail to achieve this maximum. Many more would fail to rear all children born successfully to adulthood.

This situation is now reasonably well documented for Melanesia, a consequence of the much lighter and a much more recent external contacts characteristic of Melanesia in many areas, and because intensive studies of situations much closer to the uncontacted traditional state were feasible by researchers trained in modern social and medical sciences.

Traces of similar attitudes and practices have been discovered in other related societies and now the question must be raised whether these attitudes were once spread much more widely in the groups, Polynesian and Micronesian, descended from the parent Melanesian culture. Archaeological discoveries in recent decades have firmly established this ancestral linkage.

It is likely also that even in cultures ancestral to the Melanesian, similar attitudes will be discovered. Recent fieldwork among a foraging Negrito people, the Jahai, in the Tanah Merah district of Kelantan, Malaysia, revealed that their attitudes to fertility parallel those of most Melanesian peoples very closely. A prohibition on sexual intercourse between parents for 3 - 4 years after the birth of a child, was noted with track-walking capability by the child specified as the indication that it could resume. There was also the systematic use of perceived contraceptive materials, and a willingness to specify frankly the reasons why child-spacing (and small family size in this case) were necessary given their way of life (Gomez and Rambo, 1976). Recently, two Pacific atoll populations, one Micronesian (Eauripikreported by Levin, 1975) and the other Polynesian but in the Trust Territory of the Pacific Islands (Nukuoro reported by Carroll with Feeney, 1975) have been shown to have had not only exceptionally low traditional mortality (e_x^o about 60 years) but deliberately low fertility as well with indication of long-term homeostasis.

The fact of the low mortality occurring together with a low level of land exploitation, a "quite conservative" perception of the degree to which their resources will permit population growth (Carrol, 1975: 355) is more convincing evidence of low fertility in the pre-historic era than any explanation put forward by Carroll himself. Nukuoro was a relatively favored island, with a high and dependable rainfall, a rich lagoon in which to fish, little destructive weather, no warfare, little risk of loss at sea although with some risk of the occasional tsunami. It was extremely isolated, to the extent that evacuation to neighbouring islands in case of catastrophe was impossible. It seems also to have been extremely hygienic; yaws, one of the few pre-contact diseases in most Pacific islands was apparently absent (Carroll, 1975: 360).

Data on the pre-historic population is more certain than most: from an initial settlement group of "about two dozen", over a period of four or five centuries the population accumulated to show a total of 124 persons in 1878 (Kubary in Carroll, 1975: pp. 350-1). But Carroll was unable to establish the prevalence of any of the major fertility inhibiting mechanisms: no recall of post-partum taboo -- at least by the time his fieldwork was done (1963-7), no contraception, and he rejects the "simplistic view that ... [abortion or infanticide] alone could account for population stasis on Nukuoro. In particular we should rule out the abortion as a possible cure for overfertility -- the Nukuoro believe, with considerable justice [!] that an abortion usually renders the women sterile." (p.355) Nevertheless, the method described is the traditional one regularly used elsewhere in the Pacific islands. Kubary (an ethnographer of the first caliber according to Carroll) who visited the island first in 1873 and whose contact was continual over 20 years stated "The

number of Nukuoro living today is a very small one, which must probably be ascribed to the very widespread custom of killing children before or after birth." (Kubary, 1900: 84) Carroll's other suggested reasons for low fertility, sexual ennui, fear among males of being debilitated, and the possibility of extended adolescent sterility due to early excesses, are unconvincing: they prevail in many other Polynesian populations whose fertility levels are nonetheless spectacular. The evidence for low fertility which Carroll obtained for women born between 1860 and 1929 show a high proportion of childless women (55 percent in the 1860-1879 cohort and slowly decreasing in proportion, but still 27 percent in the 1920-29 cohort). One must raise the possibility that the phenomenon is due to gonorrhea-related physiological damage to the reproductive systems of a high proportion of Nukuoro adults. Barrenness at this level in any society, let alone a Polynesian, is almost certainly involuntary. When combined with other evidence included in this account, including the likely source, the Marshalls, which had already been heavily impacted by the influx of whaling crews by this time, the possibility becomes a virtural certainty. Even the low figure related to fertile women only, a mean of 3.44 children each in the 1860-1879 cohort, is likely to be related to gonorrhea since the effect of this disease is likely to be cumulative, increasing the difficulty of becoming pregnant and finally preventing it totally.

The material on Nukuoro fertility presented by Carroll is therefore suspect and cannot be included usefully in a discussion of traditionally low levels of replacement on this atoll. Nevertheless, the more certain data relating to their low mortality does, of necessity, imply very low traditional fertility employing traditional methods over several centuries

prior to contact by Atlantic peoples. The possibility that a post-partum taboo was employed, but that it had been discarded and abandoned so long before Carroll's fieldwork so that no recollection of it survived, must be considered. Cultural change in these matters can be astonishingly swift. The other possibility, somewhat greater, is that infanticide and/or abortion was practised methodically and deliberately for demographic reasons. In this, Nukuoro would resemble many other Polynesian societies (e.g. Tahiti, see Levy, 1973: 436).

Whatever the doubts one may have about the use of Carroll's data on fertility, the conclusions he puts forward are worth serious review.

> "The Nukuoro community did not suffer severe depopulation in the early contact period, and, from all appearances, both fertility and mortality were low throughout the nineteenth century [and before?]. In the absence of warfare, migration or natural catastrophe the pre-contact population appears to have remained constant in size - and a level far below the theoretical "carrying capacity of the atoll - without recourse to infanticide and abortion [?]....
>
> The net effect of the establishment of colonial rule on Nukuoro was to increase both mortality and fertility .... Interruptions ... such as cessations of shipping during wartime seem to have brought temporary relief, whereas changes in the tenor of colonial rule (as in changes in government or dramatic changes in government policy) have worsened the demographic picture .... In the contemporary colonial [westernizing?] situation the community has lost its powers of self-regulation ....
>
> The process of reestablishing population homeostasis is aided by effective community leadership and hindered by the confusion inherent ... in colonial regimes (pp. 392-4).

Carroll's view of the transition taken by Nukuoro's population is that, while previously the community retained the power to take corrective action when fertility appeared to be creating social pressure, in the contemporary situation, this power has been seriously eroded. Nukuoro has become embedded in a larger system, one which allows emigration to

siphon off excess population (in this case to the district center at Ponape, the rest of the Trust Territory and even Hawaii and North America) and that the current high fertility is related to the current social disorganization, in a similar way to the earlier phenomenon of high mortality after first outside contacts. Modern public health measures are alleviating the effects but can scarcely be expected to cure the condition.

The view that Pacific island populations were characterized by moderate or even low mortality and fertility in pre-contact times would resolve many of the hitherto puzzling aspects of the low densities prevailing at the time of first discovery, and also offers an explanation for the dramatic increase in fertility which has since occurred.

As an hypothesis it is by no means proven. Evidence for the less acculturated Melanesian region is strongly supportive with quite low fertility persisting in some areas, and traces of the necessary attitudes still quite prevalent throughout. This is in spite of notably worse mortality conditions, principally related to malaria, until very recently, in Melanesia in comparison to the pre-contact conditions in Polynesia and Micronesia. But traces of some of the necessary mechanisms, notably postpartum taboos have virtually disappeared, and Western legal systems and the Christian missions have heavily influenced the traditional ambivalence about infanticide and abortion, on the side of disapproval, in both Micronesia and Polynesia. It will now be difficult to reconstruct the picture of what attitudes were and how effective their application in the pre-contact period. It is however no longer acceptable to assume that both mortality and fertility were traditionally high merely because historical records indicate that this was so after contact. The initial premise that the classical situation preceding the demographic transition

in traditional societies always followed the European pattern of high virtually uncontrolled mortality occurring with compensating mechanisms and attitudes promoting high fertility seems to have been undermined in the case of the Pacific islands.

The effects of contact with the Atlantic peoples is well documented and, although there have been problems of interpretation, the major alterations are well described and their magnitude measured.

Our knowledge at its present stage suggests that

(a) Usually, mortality levels were raised whenever and wherever alien visitors come into contact, sporadically or, more particularly, continuously, with Pacific Islanders.

(b) The mortality would be of two kinds (i) epidemic following the introduction of unaccustomed or highly infectious diseases, sometimes rising to catastrophic levels, e.g. small-pox, measles and influenza. (ii) endemic, caused by diseases which became established and remained prevalent within the population, e.g. tuberculosis.

(c) that each island group, and often each separate island, or even each separate valley, has its own unique history of contact with aliens, disease introduction and reaction, so that the effects were unequal. The work of McArthur (1968) for instance pointed up this variation. In several island groups, particularly Samoa, Tonga and Fiji, population loss was relatively small and recovery achieved early. Other groups, such as the Marianas and the Marquesas became notorious cases of death, grief and degradation as populations shrank over long periods to minute fractions of their former levels. Most major populations had stabilized by the 1930's, but depopulation persisted in some small groups until after World War II. In most of the worst cases, not only mortality had been affected,

by introduced disease, but also fertility which was significantly lowered in several groups by the prevalence of the fertility inhibiting sequelae of gonorrhea in both females and males (Piric, 1972).

In the absence of fertility inhibiting disease, the average number of children born to Pacific Island women seems to have increased. The reasons for this increase are not well established, and nor is its magnitude. That small increases occurred has been admitted by several demographers working in the Pacific, but the problems of analysis and interpretation were often compounded by doubts about the accuracy of data. Were recorded increases in the numbers of births merely the result of more complete counting or registration? Had the appearance of increasing fertility been due to a decrease in infant mortality which allowed the proportions at young age in many island populations to increase dramatically? Or was the increase in fertility a large surge in response to lessening pressure from enhanced mortality or from social dislocation and disrupted leadership caused by the imposition of alien control?

While problems of inadequate data and conflicting interpretations make these questions difficult to resolve finally, there can be little dispute over the decline in mortality, in classic conformity to the demographic transition model, caused by the application of modern medicine.

There are numerous examples of Public Health systems being organized, strengthened, or used for campaigns against specific diseases (such as yaws, tuberculosis or malaria) and, as a consequence, producing measurable demographic responses almost immediately. Several of these have been well-documented e.g. American Samoa under the U.S. Navy after 1900; Western Samoa 1923-1927; British Solomon Islands malaria program after 1957.

While the power of modern Public Health systems has been spectacularly demonstrated to many Pacific island societies, Western medicine is still accepted by many islanders with misgiving as an alien and terrifying phenomenon to be avoided or escaped from if possible. The stoic suffering of pain which could be easily alleviated, refusal to enter hospitals or clinics and resort to traditional herbal or magical prescriptions rather than, or sometimes in conjunction with, modern remedies, is still to be very frequently observed.

Health systems, almost invariably dominated by Government Health Departments, are still ill-equipped to deal with any but the routine ailments, children's diseases, pregnancy and childbirth. Cost per head tends to be low, and complex surgical and elaborate testing capability is limited. The consequence is that while mortality measures such as the crude birthrates tend to be extremely low (5 to 8 per thousand being quite common), these levels are often as much a function of very young population structures as of genuinely low mortality. Age-specific mortality rates tend to be at least two to three times as high as the lowest levels found in advanced countries. Further substantial improvement would entail steeply rising costs, which usually are considered to be poor investment by development-conscious governments.

Variation in mortality levels is still quite wide with a range from Papua-New Guinea, where extremely high rates still persist in many more remote areas, to populations in which expectation life is exceeding the biblical life span (70 years) as in American Samoa. Although environmentally related and easily rectified conditions persist in all the groups and mass campaigns against specific diseases (notably malaria) are still necessary in some areas, the trend is toward improvement, rapid and spectacular in some instances.

Mortality Indices

Country	Expectation of Life M	F	
American Samoa	71	73	(1969-1974 Brass method on 1974 Census)
Br. Solomons	57		(1970)
Cook Island	59	63	(1966)
Fiji-Fijian	61	65	(1971)
-Indian	57	60	(1971)
French Polynesia	57	59	(1964-1967)
Gilbert and Ellice (Tuvalu)	55	56	(1968-1975 Brass method on 1973 Census)
New Caledonia (Mel.)	54	57	(1963-1967)
New Hebrides	52	53	(1967)
Niue	61	65	(1966-1967 Murthy)
Papua, New Guinea	49		(1966-1971 Lewis)
Tonga	53	52	(1966)
Trust Territory of the Pacific Islands	61	62	(1969-1973 Brass method on 1973 Census)
Western Samoa	61	65	(1961-1966 Wander)

The initiation of fertility decline, as the beginning of the final phase in the demographic transition, is well advanced in only a few of the island groups, but there is little evidence except possibly in some Melanesian societies that fertility is still increasing. In Polynesian and Micronesian societies, the highest levels recorded tend to exceed a T.F.R. of 6.5 and some approach 8.0 (e.g. Cook Islands, Tonga, Western Samoa.)

In some countries, fertility is obviously declining in response to modernization, particularly where this stimulus is assisted by government sponsored family limitation programs. The populations in which this movement is best developed are:

(a) Guam, where the Guamanians have been heavily acculturated and the population is impacted by American military personnel with their dependents, and by the Federal Government.

(b) American Samoa, where the U.S. Government has intervened massively to monetize the economy, to transform the traditional subsistence agricultural society into a modern wage-earning dependent one, to provide high quality public health care, which was particularly successful in lowering infant mortality, and to promote a family planning program within the Public Health framework. The family planning effort was fairly successful, although not without its problems both political (their Congressional representative accused the program of genocide through sterilisation) and local, where indifference or hostility seemed to be as prevalent an enthusiasm. Nevertheless the slogan "You space your coconuts, why not your children?" became widely known and the rapid decline in fertility unmistakeable. (Fig. 3) The amount of administrative effort and expenditure involved in producing this result makes the model inappropriate as a basis for extending the system into most other Pacific Island countries.

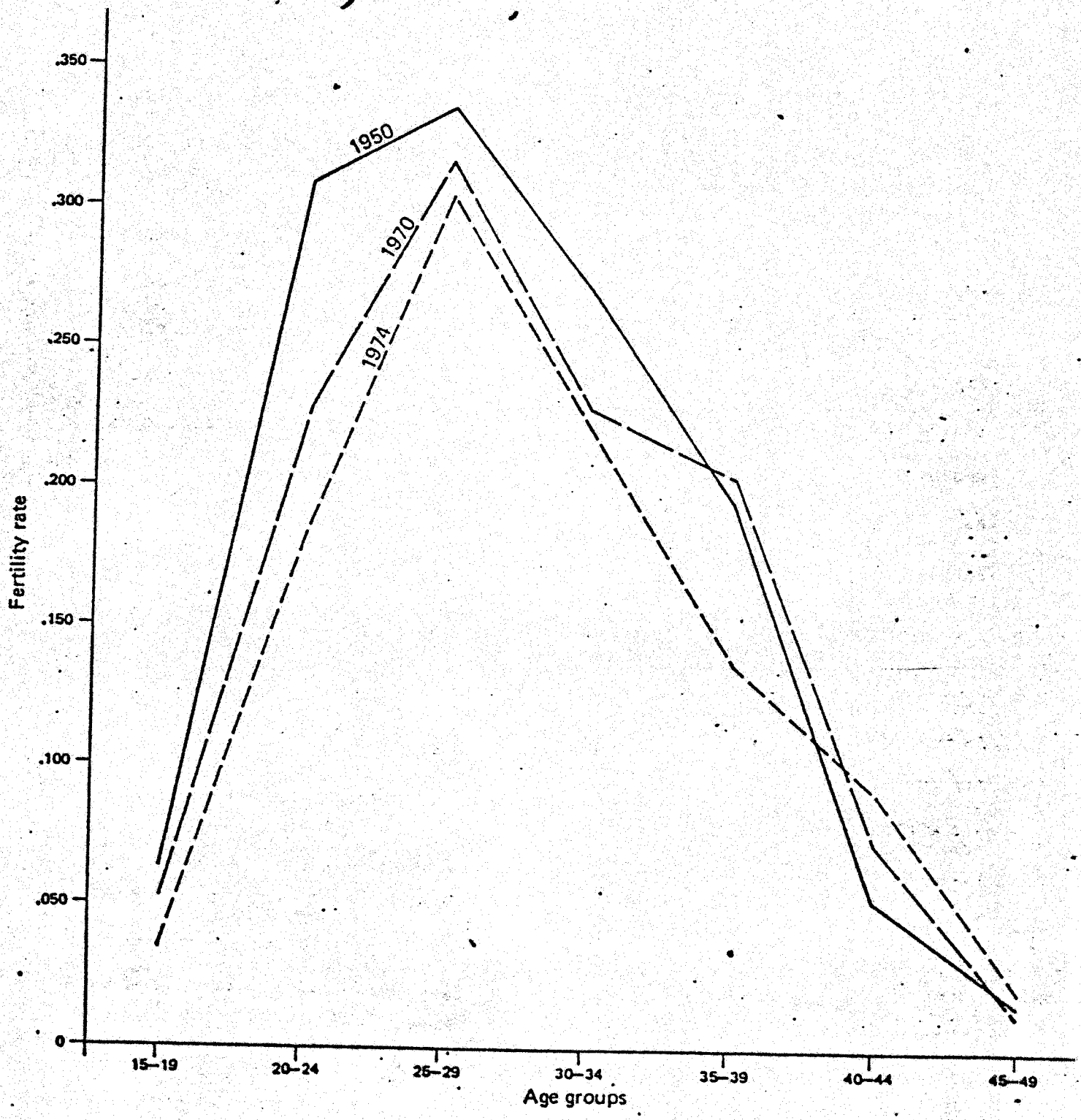


Figure 3 Age-specific fertility rates, American Samoa

(c) Fiji has had a vigorous family planning program in operation since 1958, and the concept adopted as official policy in 1962. Even before this, fertility was falling particularly among the Indian component, which showed an increasing tendency to postpone their marriages, traditionally very early, to later age (e.g. in 1946, 75 percent of Indian females in the 15-19 age group were married but by 1966 the proportion had dropped to 22 percent). Initially the response of the Fijian (Melanesian) component was slight, but after 1966, they too showed a marked fertility decline. Administration was two-pronged, with the Family Planning Association of Fiji, a voluntary organization, providing promotional impetus and the Fiji Medical Department concerned principally with the delivery. The effect is undeniably impressive and the decline, c.10 per thousand in the rate of natural increase has few parallels in the world elsewhere, particularly in populations which are largely rural, agricultural and not very well educated.

(d) The Gilbert and Ellice Islands (the latter are now separated from the Gilberts and have been named Tuvalu, but until 1975 the two were administered together, and this included the Family Planning Program).

This group is an extreme position demographically with perceived overcrowding in an atoll environment with a very narrow resource base. The economy is precarious with the further prospect of abrupt decline once the major export industry, the mining of phosphate on Ocean Island, is exhausted in the next few years. Fertility never reached the higher levels encountered elsewhere in the Pacific and infant mortality remained poorly controlled until very recently (IMR of 124 per 1,000 (at least) in 1965).

Family Planning as a movement dates only from the late sixties; a voluntary Association was formed in 1969, followed in 1970 by official endorsement from the colonial government and the inclusion in a three-year

TABLE 2

Fiji Gross Fertility Rate

Year	Fijian	Indian
1962	175.03	203.19
1963	174.93	191.15
1964	173.40	187.64
1965	167.88	174.31
1966	173.57	167.82
1967	146.18	149.19
1968	150.47	136.59
1969	125.10	143.77
1970	132.93	134.79
1971	134.46	133.85
1972	126.69	117.93
1973	117.98	118.95

TABLE 3

FERTILITY INDICES

	Am. Samoa 74	Br. Solomons 70	Cook Is. 66	Fiji (Fijians) 71	Fiji (Indians) 71	French Polynesia 64-67	Gilbert & Ellice 73	Guam 70	Nauru 66	New Hebrides 67	New Caledonia 63-67	Niue 66-71	Papua New Guinea 73	Tokelau Is. 61	Tonga 66	Trust Territory of Pacific Is. 73	Wallis & Futuna 69	Western Samoa 71
15-19	.032	.066	.125	.046	.060	.118	.066	.092	.109	.093	.097	.100	.078	.061	.055	.086	.027	.035
20-24	165	247	365	.224	.245	.331	.227	.296	.378	.335	.245	.400	.316	.273	.270	.302	.253	.256
25-29	276	298	396	.220	209	322	222	254	284	341	281	.325	.327	380	378	347	326	.336
30-34	203	279	309	145	115	234	172	170	289	275	220	190	291	301	340	304	374	276
35-39	125	221	204	101	068	174	123	101	272	125	174	130	234	131	230	224	260	223
40-44	084	124	106	032	022	080	051	025	069	065	084	.085	127	007	125	106	149	105
45-49	019	037	016	-	-	005	008	002	013	021	016	037	059	-	024	018	-	037
Total Fert. Rate	4.5	6.4	7.6	3.8	3.6	6.3	4.3	4.7	7.0	6.3	5.6	6.3	7.1	5.8	6.8	6.9	6.9	6.3

Development Plan, of a reduction in the birthrate as the first priority. The program has followed the British pattern of having a voluntary Association to handle the organization and publicizing of the program as a popular movement, thus freeing the government from becoming involved in possibly controversial policy debate and tedious decision-making processes involving sensitive topics. This structure is particularly effective in colonial situations.

By 1972, 36 percent of the women between 15 and 44 years had accepted the services of the program, with the peak at the 20-24 age group. The methods used included the I.U.D. (47%), orals (25%), Depo-Provera injection (22%), rhythm (4%). In 1971, the ovulation method was introduced on a large scale and women of the Roman Catholic faith particularly were instructed in its use. About 400 women adopted this system in its first year.

The results of this activity were apparent in the most recent census of the Colony, when the numbers of 0 - 4 year olds was markedly lower than had been projected (by approximately 2,500 or 23 percent).

This response is the most spectacular witnessed so far in the Pacific, and must be one of the swiftest alteration in the fertility habits of any population anywhere. The situation was an unusually favorable one, however, with a small population perceiving limited and declining resources and the threat (but not yet the actuality) of lowered living standards within their own lifetimes. Surveys made in the group of desired family size found an average of 3.0 children at the same time as the T.F.R. was 6.2. The Family Planning program was able to proceed with a minimum of political interference and to marshal techniques practical assistance and precedent internationally. For all these advantages the program is a better model for

application elsewhere in the Pacific than is the American Samoa model, much more expensive, and less successful.

Even under favorable conditions however, in the last two years the program has slowed down, and the number of acceptors has stayed more or less stationary. The reasons for this are partly administrative, but must also lie in the disinclination of many islanders to reduce their family size to the very low levels some administrators were hoping for. It is also apparent in this instance that the methods employed are not yet without their problems. Data on discontinuation and switching rates indicate a considerable degree of dissatisfaction with each method, and unpleasant side-effects from one method often induce women to abandon family planning entirely.

In several countries, family planning has been relatively unsuccessful, with Western Samoa, for instance, making very little headway in spite of the considerable effort and expense supplied. In this case, the enthusiasm and support has been mainly foreign. The most recent census indicated a fertility situation which was static; at least this is a change from previous censuses which have indicated a steady rise.

Conclusion:

The changes in the levels of mortality and fertility characteristic of the Pacific Island region have usually been rapid, often drastic and externally induced. There is some evidence that at the time of contact, the levels were not those assumed in the traditional theory of demographic transition, and that subsequently, the demographic histories of each island group became highly individualized as they were approached differently by outside contacts. Since the beginning of this century however, very unevenly, the control of mortality has been gradually assumed by the governments con-

cerned and has, particularly since World War II, been steadily more effective. It may be assumed that this trend will continue, with the more retarded countries, such as Papua New Guinea gradually catching up, and the more advanced, such as Fiji, showing improvement compatible with the other demands on the financial resources of the governments.

The decline in fertility is still, except in a very few cases, at an embryonic stage, but the examples given would indicate that the transition will eventually be accomplished. In the cases used in this paper the drops in fertility have been extremely rapid, although the appearance of plateaux, during which rates remained static, is also characteristic. In all the successful cases so far, the populations have been a little above the minimum levels of prosperity characteristic of the Pacific, but still rural and not very well educated, although usually literate. The support and expense of implementing successful family planning schemes has been very considerable and the outcomes never run certain in the early stages. It is unlikely for instance that a program among the Fijian component in Fiji would have been able to sustain the lack of success for five years or so, before suddenly becoming quite successful, had not the value of the program among the Indian component been well recognized.

Perhaps however, the greatest guarantee of eventual success lies in the suspicion that, for the Pacific populations, the control of family size is a return to an ancient tradition which the spasm of fertility induced by social and political disruption has obscured in recent years.

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Bangar

Country Development Strategy Statement

SMALL PROGRAM STATEMENT

FY 1984



South Pacific

January 1982

Agency for International Development
Washington, D.C. 20523

AGENCY FOR INTERNATIONAL DEVELOPMENT

SOUTH PACIFIC

SMALL PROGRAM STATEMENT

FY 1984 – FY 1988

January 1982

THIS STRATEGY STATEMENT HAS BEEN PREPARED BY THE A.I.D. FIELD MISSION. IT IS PREPARED ANNUALLY AND USED FOR PLANNING PURPOSES IN THE FIELD AND IN WASHINGTON. IT DOES NOT REPRESENT OFFICIAL AGENCY POLICY.

MEMORANDUM

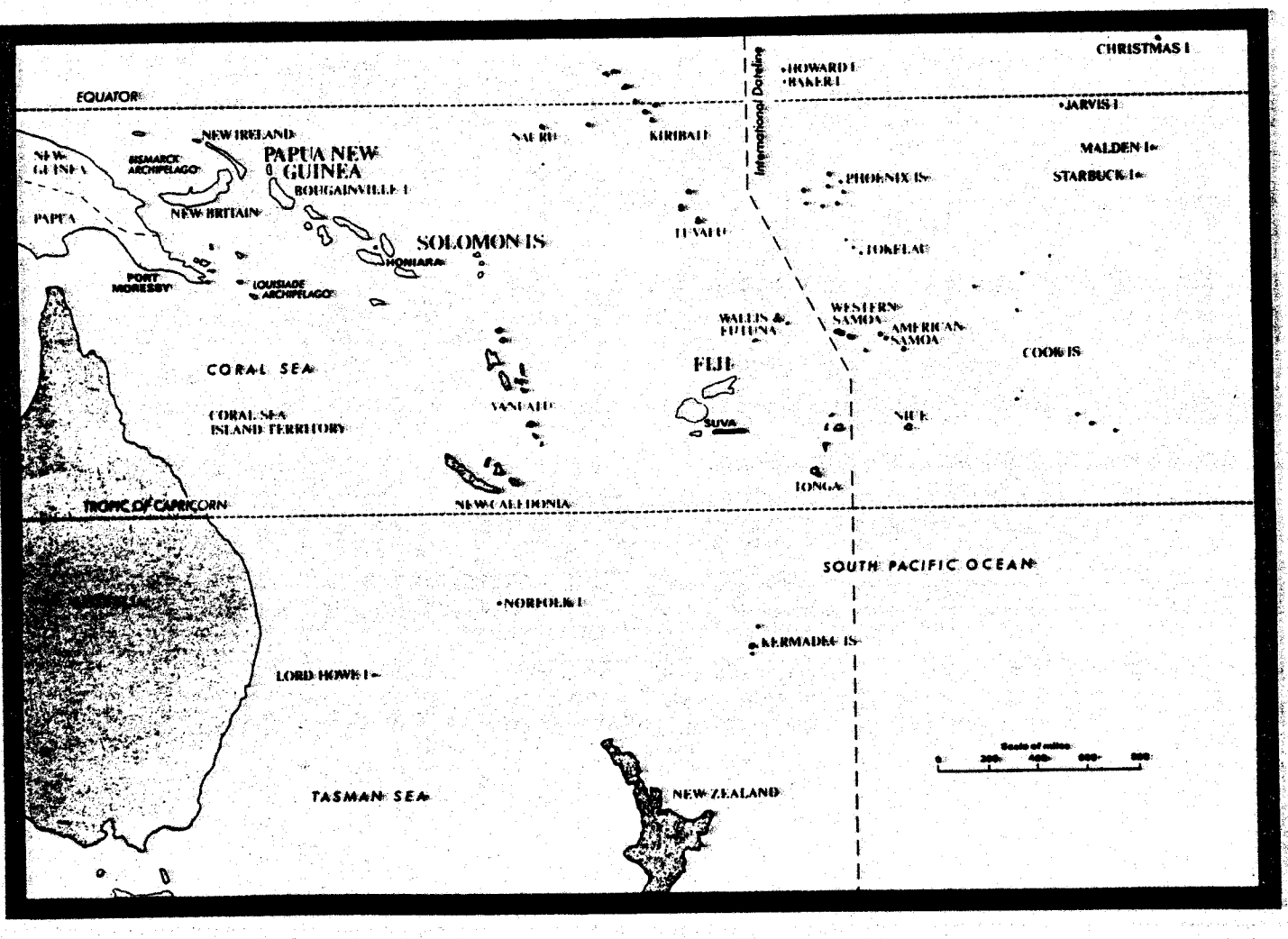
January 15, 1982

TO : Assistant Administrator, Bureau for Asia

FROM : Robert V. Craig, Sr., SPRDO/Suva

SUBJECT: Small Program Statement - South Pacific: FY 1984 - FY 1988

The following strategy statement was prepared by the four direct-hire members of the South Pacific Regional Development Office at Suva, during the closing months of FY 1981 and the first days of FY 1982. We attempted in this paper to outline a strategy which allows the smallest donor in the South Pacific, A.I.D., to make a substantial contribution to development by addressing low capital initiatives among the rural poor and primarily through the private sector. The program concentrates on the types of training which will permit South Pacific islanders to make best use of their own time and talents as well as to utilize the output of larger aid initiatives in the South Pacific by other donors to the best advantage.



SUMMARY

Early European explorers to the South Pacific were charmed by the apparently effortless existence which the islanders enjoyed. Those explorers who came from a part of the world where pestilence and hunger were prevalent found peoples who without a great deal of effort were able to provide amply amounts of food, clothing and housing from the land and the sea.

However, the life that they led and the life that they lead substantially today is one of subsistence agriculture. During the last half century massive contact with the outside world has created a growing desire for the trappings of industrial living. The cultures of the South Pacific islands is based on the life-style of subsistence living. As the demand for cash incomes increases islanders are frustrated both by its conflict with their own culture and their own inability to secure a cash income. The South Pacific is in this sense a paradise lost.

The major infrastructural problems of the South Pacific which are immense on a per capita basis because of the smallness of the island populations and the great distances involved are being satisfactorily addressed through bilateral and multilateral aid from nations and organizations who are more directly connected with and concerned with the South Pacific. New Zealand, Australia, the two developed countries of the South Pacific, are quite logically the primary bilateral aid donors.

South Pacific islands moved from colonial status to independence in the 1970s. US foreign assistance, which began experimentally in 1977 in Papua New Guinea after its independence, is in a stage of gradual growth with the goal of providing a modest, non-bilateral indirect assistance program through intermediaries to the countries of the South Pacific. These indirect programs are being concentrated in the narrow area of providing appropriate education and training including useful low level, low capital technology concepts from the northern hemisphere into the South Pacific.

The United States aid program in the South Pacific, administered by the South Pacific Regional Development Office (SPRDO), is a small portion of the total aid being directed to the South Pacific. The programs which are being conducted by the US in the South Pacific are primarily those of providing training in agriculture, fishing and agribusiness-related trades as well as development administration which allow the islanders to make best use of their own talents, resources and other aid inputs. It is that concept which allows the US to make a positive and substantial contribution to development with limited funds.

All AID programs in the South Pacific are funded through intermediaries: primarily American private and voluntary organizations, the Peace Corps and two regional organizations--South Pacific Commission and University of the South Pacific.

I. ANALYTICAL PROFILE OF THE POOR

A. The Setting

Ten countries of the South Seas constitute the area of concern for the USAID South Pacific Regional Development Office: Papua New Guinea, Solomon Islands, Tonga, Western Samoa, Fiji, Tuvalu, Cook Islands, Niue, Vanuatu and Kiribati. With the exception of Papua New Guinea, the land mass of these island countries is quite small, bespeckling a four-million square mile area of the South Pacific. The following chart shows the major population and area characteristics of these countries.

Country	Estimated Population	Land Area (Sq Km)	Sea Area (000 SqKm)	Population Density (Sq Km)
Cook Islands	18,500	240	1,830	77
Fiji	619,000	18,272	1,290	34
Kiribati	57,300	690	3,550	83
Niue	3,600	259	390	14
Papua New Guinea	2,944,000	462,243	3,120	6
Solomon Islands	217,700	28,530	1,340	8
Tonga	95,800	699	700	137
Tuvalu	7,400	26	900	285
Vanuatu	114,500	11,880	680	10
Western Samoa	155,000	2,935	120	53

Source: South Pacific Commission "South Pacific Economies 1979: Statistical Summary".

Governmental respect for human rights in the independent countries of the South Pacific may be among the highest in the world. The country of Fiji was, in early 1980, cited by Amnesty International as one of the ten countries in a survey of almost 100 which appeared to be free of human rights violations. Although no such judgments have beer made on other Pacific islands, the ambiance of the Pacific is such that one can draw conclusions about other countries in comparison to Fiji. Of the ten countries dealt with in this paper, all are relatively new independent governments whose governmental directions are guided by the communal views of the South Pacific in which governmental repression of individual rights is, at most, a very unusual event.

These ten countries of the South Pacific are ruled by consensus from the lowest to the highest levels of government. At times, this is described by the islanders themselves as "the Pacific way" and it permeates all segments of government and private activity. There are surely cases where individuals have been mistreated by a government authority at some level but the patterns of behavior of the judicial and law enforcement arms of Pacific governments can only be described as more merciful than just.

Each of the countries is radically different from the other in terms of languages, peoples and cultures. In Papua New Guinea, there are more than 700 known languages and a great diversity among the peoples. More than one-half of the population of Fiji is Indian--descendants of indentured servants brought to that country a hundred years ago.

The island countries in the east are relatively free of major diseases, such as malaria, which plague other developing nations. The jungles of the eastern Pacific are benign. Large and dangerous animals are unknown, poisonous snakes and insects are all but non-existent; but, to the west, in Papua New Guinea and Solomon Islands, the reverse is true. The jungles of Papua New Guinea are some of the most hostile in the world. Malaria is a problem in both countries.

There are no serious food shortages in the South Pacific. The plants which produce native foods require little care and are plentiful. The ubiquitous coconut tree provides for many needs of a South Pacific family, including small cash incomes through production of copra. The pandanus tree provides both building material for houses and leaves for weaving mats, an essential element of furnishing for houses. The roots of taro and cassava plants provide the bulk of the diet for South Pacific islanders. These fleshy, starchy roots are the South Seas equivalent of rice in Asia. There are vegetables and small amounts of meat and fish. Most South Pacific islanders suffer from protein deficiency. Children suffer secondary malnutrition due to parasitic diseases induced by poor sanitation and unclean water.

The weather of the South Pacific is quite hospitable, reducing the requirement for housing and clothing. The thatched leaf hut has provided the standard residence for South Pacific islanders for many decades. The materials for such a house are free. The labor required to build, maintain and re-build is considerable.

The health of eastern Pacific islanders is encouragingly good. Their major health problems generally stem from poor sanitation, including polluted water supplies. Infections of the digestive tract are a primary cause of concern, particularly among children. Malaria is a significant problem in the Western South Pacific, growing worse in Solomon Islands.

Life expectancy in the island countries ranges from 52 years in Papua New Guinea to 63 years in Western Samoa and Fiji. Infant mortality ranges from 10 per 1,000 live births in Tonga to 96 per 1,000 births in Papua New Guinea.

Education of the islanders varies considerably. Literacy rates range from 13% in Solomon Islands to 98% in Western Samoa.

Subsistence activity is very important in South Pacific economies. The per capita GDP of all other countries ranges from $382 in Solomon Islands to $1,327 in Fiji. The high per capita figure for Fiji is accounted for by relative prosperity on the two largest islands. The outer islands, shut off from the larger by as yet massive unsolved transportation and communication problems show a per capita GDP of $253. But, until recent years, the subsistence style of life with relatively easy access to food has provided the islanders with an existence in which money does not play a significant role.

South Sea societies, both Melanesian and Polynesian, are communal in nature. This communality plays an important role in the well-being of the islanders. There are virtually no hungry people in a communal society. Those who are down on their luck can always share with those who are not.

Through the years, it has been the easy access of the rudimentary requirements of life that has given the South Pacific its reputation as a paradise in literature. Increasing contact with the outside world is changing the very nature of the South Pacific and its peoples. The peoples of the South Pacific today have been exposed to the values of other societies and are no longer content with subsistence living. This is particularly true among the young islanders who have expressed their dissatisfaction by either migrating to the towns of the South Pacific or leaving their countries altogether for New Zealand, Australia, the United States and other countries. The immigration of islanders, particularly the young, is a significant disadvantageous factor in the South Pacific.

Contact with the outside world has created a desire for the products of the outside world and yet the island countries have little to export in exchange for these products. Their isolation from much of the world makes both export and import an expensive and time-consuming operation. Farmers' products are primarily oriented toward their own needs or other internal needs of the countries. The fishing potential of the South Pacific is quite large but also largely unexploited.

The problems of the South Pacific are, to a great extent, the problems of the young. It is the young people who are insistent on cash incomes rather than subsistence incomes. They are the first to be disaffected with a communal life in which part of their labor must be contributed to the community. They would rather spend their time at a job which paid wages rather than an unpaid village duty which simply perpetuates a subsistence economy.

B. Education

The educational systems of the South Pacific island countries may be, quite innocently, one of the great detriments to island development. Educational systems, by and large, were established by church groups in the last century and are patterned generally along the lines of standard European academic education. Only a fraction of South Pacific island children ever reach university level. Even so, the need for university-level training is also an insignificant percentage of the population.

But, the damage may be done long before a child reaches high school. Even if a child drops out of school before reaching high school--which most of them do--his orientation has been away from village agriculture and toward salaried employment. The most harmful thing children learn, they learn in school; a distaste for rural living. In addition, formal academic education does not prepare them to perform any better in the agriculturally-oriented village than before they went to school.

A bright aspect of this perplexing problem is the fact that all South Pacific island governments see this problem clearly. They are not quite sure what to do about it but they are trying to do something. Solomon Islands has set up eight community schools which it hopes, some time in the future, will turn out students more adapted to their native environment and better oriented psychologically towards their native environment than before. The effectiveness of this approach is yet unevaluated.

Developing appropriate educational and training programs for South Pacific islanders stands out as one of the great challenges of the region.

An expanded role for AID through regional institutions, private and voluntary organizations and the Accelerated Impact Program is to address the problem of appropriate education not country-by-country but island-by-island.

Solutions to appropriate education in the South Pacific may require adaptation of current academic systems, as well as initiatives in the private sector. Analysis may prove that the current academic

system, by intimation, may be changing the outlook of island children so that they are no longer comfortable in their rural island settings but yearn instead for life in a non-existent industrial setting.

One approach to appropriate education in the private sector may be that of identifying private institutions which are successfully achieving their goals of alternative education; then providing enhanced support to those institutions.

Although there are some common denominators to the problem in the South Pacific, there is probably no "South Pacific" strategy which will solve all problems of all people. For that reason, there is a danger in trying to do too much too fast. It would be far better to precipitate one or more modest pilot successes and then build upon analysis of those successes.

A contract with Organization for Rehabilitation Training (ORT) was signed in FY1981. That small initial effort allowed two experts from ORT to conduct field work in several countries of the South Pacific in hopes of providing an initial definition of the problem as well as some suggested interventions which might improve non-academic education initiatives in the South Pacific. In addition, the South Pacific Commission will conduct a seminar in CY1982 in an effort to further identify the problem. That seminar will have the benefit of the ORT work in written form for its consideration.

There are some tentative conclusions about what constitutes an effective training institution. These elements emerge.

The school curriculum is based on continuous analysis of skills needed in the target area. As the need for one skill is provided for the school discontinues that training and turns to another needed skill in the area or the school continues in the same skill but for a different target area.

There is such a school on the island of New Ireland in Papua New Guinea where two Catholic lay brothers were teaching auto mechanics and carpentry. They began the school more than three years ago after investigating skills lacking in New Ireland where the forestry industry is quite active. They selected their training based on the needs of local industry. As a result, most of their graduates are now employed. They are already making plans to discontinue automotive training and replace it with agricultural training. This is a project which SPRDO has supported financially for three years and has just agreed to support at a higher level during the next three years, to allow the school to double its student capacity from 25 to 50.

There is a great deal to be said in the South Pacific for a skills-oriented school which does not stop its activities on graduation day; a school which not only provides the necessary tools such as a set of carpentry tools but also assists the graduate in either finding salaried employment or setting up his own business.

The measure of success of any such facility is a consciously-planned system of follow-up on graduates in which, at any given time, school authorities know the degree of success or failure its students are experiencing at their graduation. This, in the end, is the final test of skills training. Without such information, the value of the school curriculum can always be brought into question.

The lack of appropriate education channels in the South Pacific is one of the leading deterrents to development as seen by South Pacific islanders themselves. The current academic system, without adaptation or supplementation, may lead to more broken dreams than any other factor in island life.

Appropriate education and all it encompasses is the key strategy for the South Pacific.

C. Development Administration

Development is hampered in much of the South Pacific by the very newness of the governments which are attempting to deal with development problems. Eight of the ten governments in the area received their independence in the decade of the 1970s. Solomon Islands and Tuvalu received their independence only in 1978. Kiribati received its independence in July 1979. Vanuatu received its independence in July 1980.

This newness of the governments identifies another major educational problem of the South Pacific--the improvement of development administration at lower levels. Three governments are trying to decentralize many of their central government functions to provincial levels in the finest democratic tradition. But, the lack of training and expertise at lower levels of government is thwarting, at least to some degree, this effort. Some American private and voluntary organizations have shown great talent in addressing such problems.

An essential prerequisite to dealing effectively with the poor of island countries is that of improving development administration abilities at the lower levels of government as well as private developmental entities.

D. Population and Family Planning

Average Annual Rates of Population Growth
(%)

Country	Last 10 Years	Last 5 Years	Growth Rate 1969-1979	Latest Census Year
Cook Islands	- 0.9	- 0.7	- 9	1976
Fiji	2.0	1.8	22	1976
Kiribati	1.7	1.6	18	1978
Niue	3.8	2.1	32	1976
Papua New Guinea	2.3	1.9	25	1980
Solomon Islands	3.3	3.1	38	1976
Tonga	1.6	1.7	17	1976
Tuvalu	2.5	4.6	28	1979
Vanuatu	3.4	4.4	40	1979
Western Samoa	1.1	0.8	12	1976

Source: South Pacific Commission "South Pacific Economies 1979: Statistical Summary".

Growth rates varied considerably from country to country. Erroneous calculations have affected some of the figures; for example, in Vanuatu, under-estimation of the mid-1975 population has, it is believed, somewhat exaggerated the 1975-1979 growth rate. Migration contributed to the high rate in Tuvalu at the time of the separation of Gilbert and Ellice Islands. Emigration caused the population to actually decline in Cook Islands. Migration in Western Samoa and Tonga caused a slow increase. In Papua New Guinea and Solomon Islands, international migration is relatively insignificant. The high growth rates in those countries are mainly due to excess of births over deaths. Where family planning has been successfully introduced, the growth rates were reduced (e.g., Fiji and Kiribati).

Traditionally, most Pacific people know and practice, to some extent, birth control methods. This may have had some slight moderating influence on the birth rates in the region. In the 1970s, most countries had a fertility rate of under 40-50 per 1,000. For some, this was caused by the measure of success of family planning and/or changes in lifestyle. In contrast, it is thought that in some countries (Solomon Islands and Papua New Guinea) fertility may have increased partially due to a breakdown of a system of post partum taboo which tended to lower birth rates in the past. Total fertility rates are still high for Papua New Guinea, Solomon Islands and Western Samoa but have reached levels below "5" in most other countries.

Country	Total Fertility Rate	Year
Cook Islands	4.5	1976
Fiji	4.0	1976
Kiribati	4.7	1978
Niue	4.3	1971-76
Papua New Guinea	7.1	1971
Solomon Islands	7.3	1976
Tonga	N/A	
Tuvalu	2.8	1979
Vanuatu	N/A	
Western Samoa	6.7	1971-76

Source: South Pacific Commission "South Pacific Economics 1979: Statistical Summary".

There is very little developmental activity in the South Pacific which is plainly labeled "family planning". That is due to a resistance on the part of islanders to foreign interventions into family planning. UNFPA is active in the area. Most other developmental aid goes to goals other than population. In the AID program is a certain amount of family planning activity built into both regional and American PVO projects. Those activities are operated usually in connection with women's programs of a developmental nature. The AID funded organization Family Planning International Assistance (FPIA) has also conducted some activities in the area but the efficacy of those programs has not yet been verified.

FPIA has had a presence in Papua New Guinea for several years. With SPRDO encouragement, FPIA has developed new programs with AID central funds in Solomon Islands with the Solomon Islands Planned Parenthood Association and in Fiji with an effective national women's voluntary organization. Both will begin in CY1982. FPIA plans exploratory investigations with voluntary organizations and selected government agencies in Tonga and Western Samoa during the current year.

E. Role of Women

Integral subsistence systems imply a social context within which peoples' roles are ascribed and behavior controlled. This includes traditional attitudes toward the sexual division of labor and labor allocation. The traditional attitudes toward the division of labor differs markedly between the Polynesian island states and the Melanesian countries.

In the Polynesian island nations, most agricultural work is performed by men. Women are confined to the home--rearing children, cooking, weaving and housekeeping generally. Melanesian women perform the same tasks plus. They do most of the planting, weeding and harvesting of subsistence gardens including carrying the harvest from garden to house. The husbandry of chickens and pigs is also a woman's duty in Melanesia. Men in Melanesia confine themselves to such tasks as clearing land for new gardens, building fences, caring for cattle and they are the prestigous producers of the cash crops for "export".

As cash crops take on added significance, these crops and cattle enclosures are usually located on prime land near villages. Subsistence gardens get pushed further from "home". This further increases the time and energy inputs required and they become an added burden for the women of Melanesia. Men and animals assume the added burden in Polynesia.

With most governments of Melanesia calling for increased local food production in the interest of national self-sufficiency, the additional labor required will fall on women already over-burdened, unless there are changes in the traditional sexual division of labor. Changes in traditional attitudes come slowly.

SPRDO is well aware of this and has, through PVO activity, attempted to change traditional attitudes by including women's activities in integrated rural development programs. The general purpose has been to upgrade village health and access to piped water, improve kitchens, privies and gardens, provide family planning information and assist in craft production with and through village women's groups. Leadership workshops are also held. The workshops' emphasis is on the comprehensive improvement of village life which includes child care, nutrition, gardening, cooking, hygiene, home repairs, fund raising, budgeting, cultural awareness and the importance of family life. These efforts will continue and be expanded. It may be rather "flip" to say so, but the conditions of women, particularly in Melanesia and their participation in community affairs did not reach their present levels in a few years; neither will such basic changes be achieved in only a few years.

Beginning in FY 1982, SPRDO plans to join the South Pacific Commission in an effort to broaden the experiences of women outside the home. The SPC Community Education Training Center is planning to broaden its curriculum to include a course in small business management which will, for example, provide bookkeeping and simple practical illustrated do it yourself type guide books covering various topics taught at CETC such as small business theory and income generating activities.

This additional support for CETC is a direct result of the WID sub-regional conference held in Tahiti earlier in the year. Coupled with the AID input, the Government of Australia has pledged assistance toward upgrading the physical plant of CETC and toward getting a women's resource bureau placed at the South Pacific Commission headquarters.

F. Energy

The nine independent nations of the South Pacific show great interest in various alternative energy sources; e.g., wind and solar energy, mini and micro hydro geothermal, biomas conversion, ocean thermal gradients and, in Fiji, a more effective use of sugar cane waste and wood as an alternative energy resource. But their expertise is limited.

US$ 2 million is programmed within the UNDP starting in 1982 in support of alternative energy projects in the South Pacific region. Co-ordination is underway to link UNDP funds--earmarked primarily for training, personnel and consultancies--with EEC commitment of up to US$ 7 million (Aust $ 6 million) to fund pilot projects in varying alternative energy technologies in several countries. The South Pacific Bureau for Economic Cooperation (SPEC) with offices in Suva is co-ordinating these alternative energy efforts in the region.

SPRDO, through its operational program grants and the Accelerated Impact Program, will continue to be interested in a number of "doing"-type projects in the energy area. We have given support for a small bio-gas digester which will generate heat for cooking from a piggery in Fiji. We are assisting the Fiji and Tonga Fisheries Departments in its efforts to bring back sail-powered fishing boats to the South Pacific, thus greatly decreasing dependence on petroleum in that vital industry. In Kiribati, a wind-powered refrigeration project is being supported by a grant from Volunteers in Technical Assistance, Incorporated under its cooperative agreement with the Development Support Bureau of AID. A second wind-powered generator is being supported in Tonga through the efforts of a Peace Corps Volunteer which when complete will help bring reading lights to an island schoolhouse.

AID-Peace Corps cooperation in alternative energy has included support of workshops on hydro-ram construction for rural farm and domestic applications and on forestry. SPRDO will be supportive of small scale project requests from Peace Corps Volunteers and local officials in these areas.

Efforts to develop methods for utilization of coconut oils as a diesel fuel for diesel engines ranging from small ten kilowatt electrical generators to ocean-going cargo vessels using diesel engines are underway in Tuvalu and elsewhere. SPRDO will support reasonable requests for experimental projects in this area of alternative energy technology as appropriate.

G. Land Tenure

Ownership of land in the South Pacific is not easily susceptible to understanding by outsiders. It is a complex system varying from country to country and difficult to compare with land ownership concepts either in private enterprise societies or communist societies.

There is a concept of communal ownership but quite different from the communality of communist countries. Interlaced with the concept of communal ownership is the concept of a more limited individual control of certain parcels of land.

There is rarely such a thing as fee-simple ownership in perpetuity as exists in the United States.

Historically, land was very important to South Pacific islanders prior to the arrival of outsiders, but it was not important in terms of monetary value. In fact, there was no provision for the sale of land.

Inasmuch as South Pacific islanders were, and still are to a large degree, subsistence farmers, the control of land on which to grow or gather the necessaries for their existence was a focal point in their lives. In addition, as in other countries of the world, the amount of land one controlled represented a degree of status, as well as providing a sense of identification, a place where people belonged.

A number of major forces have impacted on land ownership values in the South Pacific. The arrival of missionaries who Christianized much of the South Pacific a hundred years ago had its conceptual impact.

Increased contact with the outside world also impacted on the usage of land, as well as the need for additional land. Inasmuch as the islanders themselves, prior to outside contact, had plenty of land to meet their needs of the time, their concepts of ownership of vast areas in their countries were less than precise. As the need for more land developed to meet the needs of outside contacts, the requirement to address ownership grew, leading to a great deal of dissension among island groups on ownership.

The establishment of plantations which developed under colonial governments placed more pressures on the need to define more precisely land ownership.

As the islanders themselves developed a rationale for desiring more cash, the amount of land they needed per family again increased and is still increasing today, creating additional pressures on the traditional system.

The question of land ownership remains somewhat imprecise today. Generally speaking, much of the land in the South Pacific is held in a communal sense. In Fiji, much of the land is set aside as native land and is distributed to lower chiefly levels who, in turn, assign parcels of land to individual families not in perpetuity but often for generations.

The constitution of Vanuatu which gained independence in 1980, states that all the land in Vanuatu belongs to the people of Vanuatu. This states basically a right of eminent domain which causes concern, particularly to foreign owners of land in Vanuatu.

The preceding statements are only illustrative of the complexities of land ownership concepts. Perhaps the most important aspect of land tenure in the South Pacific is that there is no great rage for reform of the current status. The subject of land reform is often thought of in rather narrow western terms of fee-simple ownership. This concept has been introduced in other countries of Asia, primarily to counter the fact much of the land in a given country has fallen into the hands of a few healthy landlords. Generally, such is not the case in the South Pacific. The communal nature of the holdings makes land available to large numbers of people in sufficient quantities to meet most of their needs.

Because there is no great pressure for change, there is little likelihood that many major changes will take place in the foreseeable future.

There are two great pressures on land ownership existing today. One is the rising populations of the islands which, in many cases, is still not critical but is very critical in such countries as Tuvalu where the population density is 285 per square kilometer and in Tonga where the population per square kilometer is 137.

The second great pressure is the growing desire of islanders for more cash income. Inasmuch as there is little development of industry in the South Pacific, nor any great development foreseen, increase in cash incomes must be derived from either agriculture or fishing. As the desire for more cash grows, inasmuch as that desire is addressed towards agricultural production, the requirements for addressing land ownership are also likely to increase.

There does seem to be a relationship between clear definitions of individual land rights and production. The prima facie evidence of this can be found in Kiribati and Tonga where rights to land are stronger than elsewhere and agricultural production is also higher.

Plantation production, by corporations, has also produced higher yields but not necessarily conclusive advantages for the workers involved.

There does not seem to be an alternative system of land tenure that would be an improvement of the present state of the art. The islanders themselves seem to be content with a system of land tenure in which some intermediate source--a village chief or other acceptable control agent--distributes the land in a formula which is perceived as basically fair in the minds of the individual families. It is quite likely that a system of land reform which provided individuals with the rights to hold property in fee-simple with the additional rights to sell that land could lead, in time, to a consolidation of land holdings by a few who are able to buy small holdings from the many when the many are in need of cash.

H. Agriculture in the South Pacific

Almost any statement concerning agriculture in ten countries must carry a clause which begins "except". Thus said, one universal is that isolation, insularity and small-scale are the general characteristics of all the island nations of the South Pacific. The small size, in many countries, is a major constraint on the extent to which any economy of scale, on which modern commercial agriculture depends, can be realized. Yet "back to the farm", "increase production" are the exhortations of governments. Isolation and severe lack of inter-island links mean the population as a whole does not form a single market. The relatively small quantities which can be produced in many islands and/or countries, particularly when combined with distances to the ultimate markets implies high unit costs for Pacific island produce.

There are three modes of primary agricultural production in the South Pacific region: (1) integral subsistence systems, (2) mixed subsistence-cash cropping systems and (3) plantations for the indigenous coconut and sugar cane. A large element of subsistence production co-exists with monetary activity in all the nations' economies. Few are wholly involved in the latter and few, even in Papua New Guinea or the remote atolls of Polynesia are wholly outside it. For a large proportion of the economically-active, however, 85% of the estimated labor force of 1.25 million in Papua New Guinea, over 50% in Western Samoa and about 25% in Fiji, subsistence production is their main employment. But, it is not their exclusive employment.

Some producers spend several years in wage employment on a plantation or in a town and then return to the village, aware of the sweetness of earning cash.

The predominant trend, however, is movement from the rural to urban areas. Given the constraints, this does not necessarily suggest that effective agricultural development requires retention of population in rural areas and that the attractiveness of town and country should be reversed. Some, on the contrary, have suggested that the "urban drift" may be an answer to agricultural development in the long run. Out-migration may provide the possibility of creating larger rural holdings that are economically-viable and provide larger internal markets for the food produced.

There is also a compelling argument against urban drift. There are simply too few jobs available in the towns of the South Pacific to accommodate a continued influx of newcomers.

A traditional mode of development is to move an agriculturally-oriented country towards industrialization. The possibility of developing industry to a large scale in the South Pacific is quite slim given the great distances involved in shipping and the small amount of industrial output which could be produced by island labor. Hence, there is no reason to be optimistic that the development of industry in the towns would create the jobs necessary to take the surplus from rural areas. Nor is it feasible to establish industries in rural areas in order to keep people there. Rural areas in the South Pacific often mean other islands where energy, roads, docks and inter-island transportation, as well as air transportation, are lacking. The few industries that do exist are usually grouped around population centers where energy and transportation requirements can be met to some degree.

For the immediate future, it seems likely that more good could be done by attempting to address the question of increasing cash income in rural areas through increasing cash agricultural products. A corollary possibility lies in the development of small-scale fishing enterprises in rural villages.

Because there is a growing press for cash in the islands, there is some question as to whether the pace of increase in cash crops can offset the demand for cash. But, it is within the realm of possibility that more intensive training in agricultural production could go a long way toward teaching rural villagers how to satisy their cash needs without leaving their native lands.

In each of the countries--agriculture, including fisheries, forestry and livestock--is the largest sector of paid and subsistence activity. A variety of methods are being used by governments to achieve

self-sufficiency in basic foodstuffs, increase rural cash incomes, improve the efficiency of production and increase export earnings in the sector. The expansion of the export base and the diversification process is to be brought about by rehabilitating and expanding existing crops and by adding new ones.

The principal method used by SPRDO is to strengthen the agricultural research, education and extension services of the University of the South Pacific (USP) to enhance its capability to provide support to the respective island country agricultural development programs. The $5.640 million grant over a five-year period will also establish an academic and in-service training program containing expanded and relevant/appropriate course offerings as well as improved skills development that will provide the region with the necessary human resource base adequate to serve the agriculture sector. A functional outreach program is to be developed whereby USP will be able to provide timely, continuing and appropriate dissemination of agricultural information and services to national agricultural institutions, the private sector and to community organizations.

In addition, SPRDO, through PVOs and Peace Corps involvement, will continue appropriate training in a rather basic sense--teaching of simple inexpensive techniques to improve the incomes of rural villagers--that is our agricultural/fisheries strategy. PVOs take what is at hand and remind villagers how to use such materials. In as many instances as possible PCVs will work in concert with PVOs. PCVs have been assigned to Fisheries Departments to work in areas PVOs are supporting in the rural area. PCVs will be trained in tropical pest management and plant protection to better provide guidance in those sub-projects involving PVO inputs to garden projects.

Both areas of concentration are designed to increase production--first at the subsistence level and to improve nutrition. Then, as techniques are mastered, producers move into the cash economy. There are already evidences of success of rural people making the transition. They are selling their fish and marketing garden produce for cash to bring other improvements for themselves, families and communities.

II. BILATERAL AND MULTILATERAL ASSISTANCE

Four international agencies (World Bank, Asian Development Bank, United Nations and European Economic Commission) and three major bilateral donors (Australia, United Kingdom and New Zealand) comprise the core group providing external assistance to the independent nations of the South Pacific. Japan, West Germany and Canada are also active in selected activities.

Middle East oil monies have begun to show up in the South Pacific. The Kuwait Fund for Arab Economic Development (KFAED) in a co-financing venture with ADB, has provided Papua New Guinea with one million Kuwaiti dinars for development of the Port Moresby port. Papua New Guinea began to draw this loan down in 1979 and will complete the use of funds in early 1982.

According to an August 24, 1981 press release from the OPEC Fund for International Development, the fund has agreed to loan Solomon Islands $1 million for balance of payments support. The OPEC Special Fund committed $1 million for rural road construction and maintenance to Solomon Islands in 1980. Total OPEC Fund lending to Solomon Islands thus far has reached $3.5 million. Loans are interest free and carry a service charge of 0.5% per annum and have a ten-year maturity including a three-year grace period.

Within the United Nations, the UNDP has headquarters offices in Port Moresby, Papua New Guinea; Suva, Fiji and Apia, Western Samoa. Several of the specialized agencies such as WHO, FAO, ITU, ILO, ESCAP, UNDAT and UNFPA have residence offices and play important roles in their areas of concern throughout the region.

Coordination takes place at inter-country meetings convened by the UNDP sometimes in cooperation with ESCAP; by the South Pacific Commission; South Pacific Bureau for Economic Cooperation and the University of the South Pacific. These formal meetings are supplemented by frequent informal gatherings. ADB and World Bank personnel touring the area always visit the Embassy for an exchange of information.

The latest figures available for assistance to the independent nations of the South Pacific from all sources are as follows:

(US$ Millions)

Country	Bilateral		Multilateral	
	1978	1979	1978	1979
Cook Islands	6.7	7.3	0.1	0.2
Fiji	24.0	25.9	1.9	37.1
Kiribati	10.0	8.8	0.7	0.2
Niue	4.1	.8	0.1	0.1
Papua New Guinea	274.4	269.4	24.6	58.4
Solomon Islands	24.1	23.1	2.6	3.3
Tonga	8.0	20.4	1.7	3.4
Tuvalu	2.5	4.7	0.0	0.0
Vanuatu	18.4	37.7	0.4	5.4
Western Samoa	11.3	20.7	8.6	13.1
Total	383.5	422.8	40.7	121.2

Source: OECD Development Cooperation, 1978 and 1979 Reviews.

New disbursements during 1979 represented a 28.2 increase over 1978. This is a dramatic increase. It is because major banks (ADB and IBRD) loans came on stream during 1979 for Fiji, Papua New Guinea, Tonga and Western Samoa. It also reflects major EEC, STABEX transfers during the year.

A. Multilateral Agencies

ADB is a major source of loan finance for its South Pacific member countries--Cook Islands, Fiji, Kiribati, Papua New Guinea, Solomon Islands, Tonga, Western Samoa and, recently, Vanuatu was admitted as a member. Over the past 12 years, ADB has lent $190 million to these countries, about 64% under concessional terms. Examples of the type of loans include: for Fiji--power expansion, development bank, upgrading of the Port Authority; for Papua New Guinea--provincial hydropower schemes, highland road improvement and Lae port development; for Cook Islands and Tonga--multi-purpose mini projects; Kiribati--rehabilitation and upgrading a major causeway. Papua New Guinea received ADB special fund resources for major water supplies, roads, the Development Bank and the East Sepik area development. Solomon Islands (the largest recipient) received funds for beef cattle development, port development, fisheries development and support for its Development Bank; and Western Samoa for airport/road development, beef cattle schemes, telecommunications, power, Development Bank support, a coconut oil mill and to the Western Samoan Trust Estates Corporation (WESTEC) agricultural development on the island of Upolu to upgrade seven estates. Tonga was recently granted a second loan for its Development Bank and a second multi-project loan including vanilla development. This loan totaled $1.68 million plus a TA grant of $120,000 for the vanilla curing improvement.

IBRD has had a policy of deferring to the ADB in the South Pacific. Its IDA window, however, is co-financing with ADB agriculture and agro-industrial rehabilitation of WESTEC for estates on Savaii. The World Bank is financing the Fiji Electric Authority power expansion. It is also financing the realignment and construction of a 32 Km section of the Nadi/Suva highway in Fiji; reconstruction and improvement of drainage works including seawalls; and dredging of about three million cubic meters of flood-deposited sand and gravel to restore the flood discharge capacity of several major rivers. The Bank loan of $18 million covers the foreign exchange costs and the remainder of $13 million will be met by the Government of Fiji. In addition to the two hydroelectric loans of about $30 million, IBRD has in progress a telecommunications project of $5 million and a sugar development project of $12 million in Fiji.

EEC entered the Pacific in 1975 after the signing of the Lome I Convention. About $80 million was allocated for the Pacific member countries for the five years of Lome I (1975-1980). Lome II began January 1, 1981 for five years. The allocation for the Pacific member countries is in the range of $97.5 million to $116 million. Actual country allocations over the five-year period will depend on the STABEX transfers it receives. The STABEX scheme provides compensation for shortfalls in earnings generated by agricultural exports. In addition, the sugar protocol has ensured guaranteed outlets for agreed quantities at prices fixed in terms of European domestic levels, which have been above world market levels in four of the last five years. Lome II extends this same insurance principle to the mining sector. During Lome I approximately $10 million was allocated for the development of regional infrastructure and telecommunications, assisting USP and the Pacific Forum shipping line. Negotiations are now underway for a follow up program under Lome II for twice that amount.

UNDP is the main body through which United Nations assistance is channeled to the South Pacific region. The aid is in the form of technical assistance. For the 1979-1981 period, this amounted to approximately $12 million. However, actual delivery of regional program assistance will be about $8 million by the end of 1981 due to lead time required from project formulation to operation. For the 1982-1986 period, UNDP planning figure is $20 million: $12 million plus $4 million to make up the 1979-1981 deficit plus an added reserve for new activities or expansion/extension of existing projects. UNDP assistance is spread over a wide range of activities, the principal sectors assisted being agriculture and fisheries (about 33%); general development, policy and planning (about 19%); natural resources (about 11%) and health (about 11%).

B. Bilateral

Australia's total bilateral assistance will be approximately A$662 million in 1981-1982. Australia's major commitments are to Papua New Guinea, the South Pacific and ASEAN region. 53% of Australia's 1981-1982 aid will be extended to Papua New Guinea mostly in the form of an untied grant for budgetary support. The South Pacific islands will receive another 8% for technical assistance ranging from specific regional development programs to the provision of simple facilities at the village level. An examination of ongoing projects and outlays indicates that of 323 ongoing projects, 120 were in South Pacific countries. Of bilateral Australian contributions of A$570 million to ongoing projects, South Pacific projects accounted for A$73 million. Inputs are in the form of funds, equipment goods, technical expertise and training. This includes grants

for staffing assistance to enable island governments recruit expatriate experts from Australia who are in the host country's direct employ. Australia's aid program also supports the Australian Volunteers Abroad and a large Development Workers scheme.

New Zealand expenditures on ODA in the year ended March 31, 1981 amounted to $62 million. Two-thirds of New Zealand bilateral aid is concentrated in the South Pacific. Of the 10 nations in the SPRDO region this amounted to about $30 million, of which $4.3 million and $1.6 million went to Cook Islands and Niue, respectively--these are nations where New Zealand has constitutional links. The $5.9 million included budgetary support, grants for staffing assistance and project aid.

The next largest recipients were regional institutions including the South Pacific Commission, South Pacific Bureau for Economic Cooperation, Pacific Forum Shipping Line, the Regional Forum Fisheries Agency and the University of the South Pacific ($4.2 million). These sums were for budget support, operating expenses and capital improvements. New Zealand also has a significant training program. Project aid is at a government-to-government level and varies in value from a few hundred dollars for school textbooks to a multi-million dollar geothermal power scheme. Project aid also often involved New Zealand advisors both long-term and short-term.

The UK is committed to providing development grants as part of independence settlements, amounting in 1979 to $108.43 million. Just about one-half of that $53.9 million, was committed to Solomon Islands. This magnitude will be continued there through 1981. New Hebrides (Vanuatu after July 1980) had a commitment of $18.1 million in 1979. Fiji, Kiribati and Tuvalu had commitments for the bulk of the remainder. These sums are for budget support, operating expenses and capital improvements. Of the total, about $16 million, was for technical assistance to enable island governments to recruit expatriate experts from the UK.

Canada's aid to the Pacific amounting to just over $1 million is almost all directed to regional institutions with the University of the South Pacific receiving about 91% for institutional improvement.

Japan has been providing aid (experts, fellowships, volunteers, equipment) to an increasing number of countries in the region--Fiji, Kiribati, Papua New Guinea, Solomon Islands, Western Samoa and Tonga--mainly in relation with the fisheries sector. Since 1975, the value of Japanese aid to the fisheries sector through April 1981 amounted to 5.060 million yen or roughly one-third of its disbursements over the same period (15,950 million yen).

III. SUGGESTED FIVE-YEAR ASSISTANCE PLANNING LEVEL AND STRATEGY

The most productive use of USAID funds in the South Pacific can be characterized by the phrase "appropriate education": utilizing talents, techniques and technologies which are readily available in the US but lacking in the South Pacific. This "appropriate education" can be further categorized into five groups of activities.

(1) Identifying, experimenting with, developing and promoting alternatives to academic education, both within government educational systems and without.

(2) Appropriate training in a rather basic sense: the identification of and the teaching of simple, inexpensive techniques to improve the lives and incomes of rural villagers through low capital technology.

(3) Assisting selected local governments in developing their expertise in the planning, programming and execution of small development projects.

(4) Increasing the amount of basic technical information flowing from the northern hemisphere into the South Pacific, closely related to appropriate education, and quite urgent, particularly in improving the economic viability of South Pacific agriculture.

In addition, there is a need to direct project funds at specific small projects directly aimed at improving the quality of life in rural areas: improved potable water systems, introduction of new cash crops, improvement in agricultural techniques for subsistence crops, etc. Not only are these projects important in themselves, but they will serve as focal points in helping local governments and organizations in exercising newly-learned small-scale development techniques.

Of particular importance are activities which focus attention on the need for improved potable water systems, in keeping with the directions of the Asia Bureau and the United Nations which began the UN Decade on Drinking Water and Sanitation in November 1980. The fundamental basic need in the South Pacific is the need to have access to drinking water.

There are a number of small islands in the South Pacific, particularly coral atolls, where drinking water is all but non-existent for several months of the year. In years of drought, this period is extended. This problem will be attacked not only regionally, through the South Pacific Commission, but through programs initiated by American private and voluntary organizations and Peace Corps Volunteers (PCVs).

One American PVO, Save the Children Federation, initiated a potable water program in the country of Tuvalu in FY 1981. The program was well-conceived and the Government of Tuvalu asked EEC to assist in the program. As a result, EEC is funneling $200,000 to Tuvalu for a potable water program managed by Save the Children. It will provide potable water for every household in that small country of 9,000 people.

A. Human Resources Development

Because South Pacific island countries are not moving towards industrialization nor are they likely to be in a position to move in that direction in the foreseeable future, opportunities rest primarily in the agricultural and fishing sectors. Their major resource is people; human resources. USAID programs in the South Pacific concentrate on upgrading that major resource by a wide range of small scale non-academic training programs ranging from part-time blacksmithing jobs through agricultural training at the farmer level, to the process of making local governments more effective in planning, costing, executing and evaluating small scale development projects. Many of the activities conducted by US private organizations are conducted in conjunction with South Pacific island private organizations. It would be erroneous to assume that that small scale AID program, in operation for only three years, has produced massive successes but it has already produced model programs in community fishing including innovative appropriate technology in that field such as the introduction of fish aggregation devices which have greatly increased community fishing catches and have caught the imagination of South Pacific islanders in several countries. There are hard statistics to show that those small projects have increased community fish catches in Solomon Islands and Tonga as well as Western Samoa.

B. Institutional Development

The Title XII project, South Pacific Islands Agricultural Development, is devoted entirely to institutional development with two major goals: upgrade the teaching facilities of the University of the South Pacific School of Agriculture and develop an outreach program throughout the 11 countries of the University system to impact directly on agricultural production.

The major components of the South Pacific budget is that of grants to American PVOs. Of the 22 grants now operational, 18 are providing support for institutional development but not in the same structured or broad way that the Title XII agricultural program is functioning. Of the total South Pacific program, approximately $500,000 a year, is not directly related to institutional development. It provides

support for fish research, rural water supplies, a women's program and the small grant program in support of the Peace Corps. A rather pointed example of small scale institutional development can be seen in a project executed by Save the Children Federation in the country of Tuvalu through the process of training island officials on eight coral atolls, the program aims at preserving the country's attempts at decentralizing and permitting islanders to define more accurately their small scale development goals. In this particular instance which is unusual even in the Pacific small countries, this program is nationwide in scope in a country where the population does not exceed 9,000 persons.

Institution-building by PVOs of the South Pacific is done on a modest scale with modest budgets directed usually at the community level. All of the 22 projects have a heavy input of training goals at the lower end of the spectrum concentrating on such important topics as ferro-cement construction, improved farming methods and community level development administration.

Another excellent example of institution-building is to be found in a project executed between Helen Keller International of the US and the Fiji Blind Society. HKI, working within the confines of an already well developed organization, is transferring its unusual American expertise in training blind people for employment. That transfer of technology will be a permanent aspect of training the blind in Fiji longer after HKI has completed its project.

C. Private Sector Involvement

The very nature of indirect AID programs in the South Pacific through intermediaries places the program squarely in the private sector at two levels. First, much of the program is executed by the private organizations, both US and indigenous, and the outputs of the programs are designed to increase productivity by indivduals and communities in the private sector.

American business has shown little direct interest in South Pacific island nations probably because each represents a rather small market not terribly attractive to American business. The South Pacific Regional Development Office has developed a continuing dialog with Governor Peter Coleman of American Samoa in hopes of encouraging him in his attempts to build export activities from the US through Pago Pago into the South Pacific. American business through its Australian partners seems to have greater access to the South Pacific markets than directly from the US.

D. Technology Development, Transfer and Extension

Woven through both the regional and PVO activities of the South Pacific are sub-activities which bring into a given area technology which is appropriate at that particular level of development. Whereas the South Pacific Islands Agricultural Development Project will be aimed at a relatively large infusion of technology into the agricultural sector, both PVO and Peace Corps projects on a smaller scale and in a more limited area are already producing technology transfers and extension of proven value.

Ferro-cement construction, a well-known and semi-skilled activity, is little known in the South Pacific where foreign contractors are often brought in to perform simple projects. Through PVO projects in Tuvalu and Tonga, islanders are being taught ferro-cement construction in the building of potable water tanks in their villages. They are also learning ferro-cement techniques can be utilized in the building of docks, boats, houses and other useful objects in their lives.

A US Peace Corps small grant in Western Samoa initiated on a pilot scale the use of fish aggregation devices. That technology also has been around for years but had never been utilized by South Pacific islanders. The success of the Western Samoa project which more than doubled community fishermen catches and cut fuel consumption to one-third has attracted widespread attention in the South Pacific. SPRDO is funding similar pilot projects in Fiji, Tonga and Solomon Islands. Island governments have asked and UNDP has agreed to fund the devices on a much wider scale.

Although there is a need for technology transfer at the higher levels including university level, the USAID program concentrates on the lower end of the spectrum where the need is the greatest and the impact most immediate.

Community fishing projects in Tonga and Solomon Islands, again using low capital, low level technology transfers, have addressed not just community fishing per se but preservation, marketing and energy conservation. In Tonga, for example, a PVO has introduced a sailing catamaran with a gasoline motor auxillary which cuts fuel costs in half. Having proved its point, some Tongans are now borrowing money and are having similar craft built for their fishing activities. The US program is in the forefront of encouraging islanders to return to sail as a method of increasing profits and conserving energy. Portable ice-making machines have been introduced in both countries which have permitted fishermen to take ice out to sea and to preserve fish for a week or more after they return, giving them opportunities heretofore unavailable for the sale of fish.

After several years of conducting model projects along those lines in Solomon Islands, other donors became interested in supporting a proven success. Building on the US PVO project, Australian aid will provide 20 ice-making machines which will be added to the 12 already in use and is expected to increase fish catches from 504 tons per annum to 1,344 tons per annum by community fishermen. Estimated cost including installation will be $153,560.

Japanese aid, impressed by the same success, will provide 500 insulated iceboxes, construct 8 rural fisheries centers over two years and provide a small refrigeration ship for fish collection at a cost of approximately $659,000. This is a solid example of how small innovative American rural projects can attract funds from major donors to enhance the impact of PVO activities.

E. Proposed Assistance Planning Levels, FY 1984-FY 1988

AID's South Pacific Regional Development Office was opened in August 1978. Its obligations for programs were modest and experimental in nature. Having identified more clearly useful directions for AID assistance, it is now possible to lay out a suggested five-year planning level which will allow the addressing of the goals stated above. A total of $5.5 million is requested in FY 1984 with incremental increases up to $7.5 million in FY 1987. Those totals represent the planning figures provided SPRDO by AID/Washington and reflect an annual increase of approximately $500,000. Unfortunately, that rate of increase will not keep up with inflation. For that reason, in order to hold the program at the current level, the total budget would need an increase as follows: FY 1984 - $5.7 million, FY 1985 - $6.4 million, FY 1986 - $7.2 million, FY 1987 - $8 million and FY 1988 - $9 million. Increasing the content of the program would require additional amounts.

The chart following depicts illustratively how the funds would be distributed among the ten countries involved, among the regional institutions and the Accelerated Impact Program which is now primarily used to support initiatives of Peace Corps Volunteers. It should be noted that the level for each country can only be indicative. The levels are predicated upon the development of satisfactory operational program grants by American and indigenous private organizations which cannot be predicted with great accuracy in advance and on the assumed response from the governments and peoples of the islands whose enthusiasm will rise and wane at intervals, requiring appropriate upward and downward adjustments in pace.

Proposed Assistance Planning Levels, FY 1984-FY 1988
($000)

Country	FY 83	FY 84	FY 85	FY 86	FY 87	FY 88
PVO Co-Financing						
Cook Islands	200	200	200	250	200	250
Fiji	400	400	400	450	450	500
Kiribati	300	300	300	400	400	450
Niue						
Papua New Guinea	950	1,000	1,000	1,000	1,000	1,250
Solomon Islands	450	700	700	800	800	850
Tonga	500	500	500	550	550	600
Tuvalu	200	200	200	250	300	350
Vanuatu	200	400	400	500	600	650
Western Samoa	300	300	300	300	400	450
Regional PVO Initiatives	200		400	500	500	550
	3,300	4,000	4,400	4,900	5,400	5,900
Regional Grants						
Accelerated Impact Program	300	300	300	300	300	300
South Pacific Commission	300	400	500	500	500	500
South Pacific Island Agriculture Development	700	700	800	800	800	800
University of South Pacific Satellite Project	200	100				
	1,400	2,400	1,600	1,600	1,600	1,600
Grand Total	5,100	5,500	6,000	6,500	7,000	7,500

IV. DESCRIPTION OF PROGRAM

The direction of US aid assistance in the South Pacific is indirect rather than bilateral. This is the most useful direction to follow. There is a sufficient flow of bilateral and multilateral aid in the South Pacific to accommodate development of infrastructure and provision of some support of private and voluntary organizations, the US Peace Corps and regional institutions, all in careful concert with the major donors.

Dealing indirectly also eliminates the arguments often voiced by recipient countries who prefer infrastructure projects or budgetary support rather than projects which directly support poorer elements of society.

A. Private and Voluntary Organizations

Private and voluntary organizations represent the foundation of the AID program in the South Pacific. They are able to reach rapidly, directly and flexibly specific groups of disadvantaged people and provide appropriate assistance to them.

Im micro states such as Tuvalu, Cook Islands and Kiribati, the suitability of private and voluntary efforts is even clearer. A currently funded AID project in Tuvalu, for example, is sufficient to address the major development administration problems of small-scale local development in that country. Tuvalu consists of eight populated islands, each with an island council. The country is, in one sense of the word, eight small villages--an ideal size for a private and voluntary program.

PVO have been asked to look closely at the role of women and to consider at least one sub-project for women in each grant. It has been determined that Melanesian women choose the land to be cultivated, they choose what crops are to be planted, they organize other women to assist in the planting, weeding and harvesting. They even have a substantial say in how the harvest will be distributed. These activities involve leadership, economics and even political negotiating skills with other members of the family or parties who may have interests in the same land. Women make decisions and are beginning to want to share in some cash income.

Our OPG sub-grants in Melanesia for women are targeted toward enhancing or improving these skills along with providing knowledge of new agricultural techniques and the use of fertilizers for cash crops. Several OPGs already provide for the services of women agricultural extension workers.

Our OPG sub-grants in Polynesia, on the other hand, are targeted to improving the woman's homemaking skills--easier ways of assuring there is plenty of food, water and firewood in her house; that her surroundings are clean, sanitary and neat. Their weaving skills are used for household items to make the house more attractive and as a "cash crop" for the women. Weavings from Tonga and Western Samoa especially are in great demand among tourists.

B. Regional Institutions

The South Pacific Regional Development Office provides support to the South Pacific Commission headquartered in Noumea and the University of the South Pacific headquartered in Suva.

The South Pacific Commission is, in fact, a regional, rural development organization. Its goals and its activities are completely compatible with AID priorities of concentrating assistance on improving the quality of life among the poor. With its own cadre of technicians, it is ideally constructed to address such problems as potable water in isolated communities, greater involvement of women in development and the evaluation and propogation of alternative education systems which are so badly needed in the South Pacific.

The University of the South Pacific is potentially an ideal medium through which Pacific islanders might hope to improve the agricultural sector through utilization of better agricultural information and techniques. With a campus encompassing 11 countries, the University has the potential for developing rather directly services and information for island farmers through its outreach programs, much in the same way that a land grant college serves a large agricultural state in the US.

C. The US Peace Corps

For more than a decade, the US Peace Corps has operated in countries of the South Pacific. It now has volunteers in Kiribati, Tuvalu, Fiji, Western Samoa, Tonga and Solomon Islands, totaling approximately 400. In October 1979, AID began an experimental program in support of the Peace Corps, known as the Accelerated Impact Program.

The purpose of this program was to improve the effectiveness of Peace Corps volunteers by allowing them to accomplish more by having access to small amounts of funds with which to further their goals. Having identified a clear need in a community, a problem in which the community itself is willing to contribute substantially in labor, cash or other means, the volunteer proposes a grant through his Country Peace Corps Director. The funds themselves are paid to the community. The Peace Corps volunteer sees the project through and assists in fiscal documentation for the use of the funds.

This program has been welcomed by all Peace Corps Country Directors. It has provided funds for projects which clearly fall within the Congressional Mandate to address the quality of life of the poor.

The impact of this program is many times the magnitude of the funds expended; in that it is able to help communities solve clearly identified problems in such areas as potable water, agriculture, forestry and other community needs in the most direct form of foreign assistance available to the poor.

The regulations governing the Accelerated Impact Program do not limit it to activities involving Peace Corps volunteers. In its early stages, the program has been limited to volunteers simply because there were insufficient funds to cover even their needs. The program itself is designed more broadly to deal with communities in the South Pacific. As funding levels are increased, the Accelerated Impact Program will be expanded to include a substantial input into non-Peace Corps community self-help projects addressing basic needs of communities.

During FY 1981, another approach to support of the Peace Corps was developed by SPRDO in order to deal more effectively with Peace Corps contingents spread over eight million miles of Pacific Ocean. In Solomon Islands and Tuvalu, programs were established to allow American PVOs to work directly with Peace Corps contingents to provide funds for small projects of interest to Peace Corps volunteers. That worked so well that the concept is being expanded to other countries in the South Pacific. Although the Accelerated Impact Program itself is not a time-consuming process, it does take a month or more to get funds to a specific Peace Corps office in the South Pacific. The technique of utilizing PVOs has cut that from weeks down to several days. It also has the beneficial effect of creating a sense of collaboration between American PVOs and Peace Corps staff operating in a given country.

D. Merging of Common Interests

A paramount working consideration in the operation of AID programs in the South Pacific is to make the greatest use of both the funds and human resources available to the South Pacific. The South Pacific Regional Development Office has been established on the premise that there is no need for a great number of direct-hire AID employees to oversee the programs.

The role of the office is not to serve in implementation of projects but to work with other organizations who have the capability of planning, implementing and evaluating their own programs. The South Pacific Regional Development Office, in addition, provides post-operative oversight to the activities of these organizations. It recommends both the major directions in which AID funds should be utilized and the levels for each country.

The US Peace Corps is an example of an organization which possesses planning, implentation and evaluative mechanisms already in existence. The directions of the Peace Corps are quite compatible with AID directions under the Congressional Mandate; hence, there is not a great deal of AID direct work force required. The Peace Corps is performing the bulk of the managerial work needed to execute small development programs which are in line with both AID and Peace Corps goals.

The same can be said of the South Pacific Commission which, in itself, is an organization dedicated to the principles stated in the Congressional Mandate and in AID New Directions.

The private and voluntary organizations working in the South Pacific are also well-fitted to this process. They provide their own staff members to supervise projects. In turn, they work with other indigenous private organizations or government entities which add additional managerial and evaluative competence to the system.

The AID staff situated in Suva also works closely with other donors, many of whom maintain offices in Suva and other Pacific capitals. This allows programs to be planned without fear of duplication and allows for cooperation and sharing among donors which has already proved a useful technique.

In recent years, AID has adopted a collaborative style of program planning between the Agency itself and host governments. The same collaborative style is operative in the South Pacific but with an additional cast of characters.

The planning process involves host governments in the earlier and more general decision-making process of directions to be traveled. Perhaps a more important aspect of the collaborative process is that conducted with private and voluntary organizations, regional organizations such as the South Pacific Commission, and the US Peace Corps. These are the entities that actually develop specific project proposals in each country.

It is, therefore, important there these organizations be included to the planning process in order to avoid developing a direction which, although agreed to by the host country and AID, is not suitable for performance by the organization who will be primarily responsible for their execution.

The key to successful programming of small AID funds through indirect methods in the South Pacific is flexibility and rapid reaction to changing circumstances.

Estimates of National Income and Government Expenditure
(A$000)
(One Australian Dollar (A$) is Equivalent to US$1.15)

Country	GDP/GNI		Expenditures (Current/Capital)		
	Total	Per Capita	Total	Per Capita	Date
Cook Islands[a]	17,400	941	14,862	803	1979/80
Fiji[a-e]	900,937	1,455	264,445	427	1979
Kiribati[a]	33,134	578	13,814	241	1979
Niue[g]	2,787	774	3,286[f]	913	1978/79
Papua New Guinea[b]	1,551,200	519	537,500	180	1978
Solomon Islands[a]	116,667	536	38,854	178	1979
Tonga[b,f]	38,167	398	16,304	170	1979/80
Tuvalu[b,f]	3,732	504	1,873[f]	253	1979
Vanuatu[b]	43,500	452	45,167	445	1978
Western Samoa[c,d]	43,500	304	44,300	288	1978

a GDP at market prices.
b GDP at factor prices.
c GNP
d GNP figure given is undoubtedly an underestimation.
e Based on new series beginning 1977.
f Provisional
g GDP at producer prices for monetary activities under public control.

Levels of national income are difficult to establish accurately because of deficiencies in data. The comparison of these figures internationally must, in any case, be undertaken with caution because of a number of fundamental problems such as differing degrees of monetization of the economies concerned. In particular, estimates of national income are often biased towards recording those activities which involve market relations and, therefore, measurable in money terms. Subsistence activity is more often than not, not adequately accounted for.

Despite the deficiencies it is possible to get a reasonably good picture of the broad situation. The figures given indicate an average income of a little over A$600 per head. Excluding Fiji, the figure drops to A$556 per head. Two countries show increases in their per capita incomes (Fiji and Solomon Islands) from those of previous years. All the others have either declined or have remained static.

Source: South Pacific Commission: South Pacific Economies: Statistical Summary 1979.

The role of government in the South Pacific economies is much the same as elsewhere, namely, general administration and the provision of public goods and services such as roads, health care and education. Involvement in business enterprises is mostly restricted to areas such as the supply of electricity, transport services or the marketing of agricultural products, though in most of these cases quasi-government organizations with a large degree of business autonomy have usually been set up. Government expenditure, both current and capital, as a portion of GDP ranges from 29% in Fiji to 50% in Tuvalu. These figures have generally been rising over recent years. The higher proportions for the Cook Islands are probably the result of data deficiencies.

Economic and Social Indicators of Development

Country	Estimated Population[2] Mid-1979 (000)	(US$) Per Capita GNP[2a] 1978	Physical Quality of Life Index[1]	Per Capita GNP Growth Rate[1] 1970-1977 (%)	Birth Rate Per 1,000[2]	Death Rate Per 1,000[2]	Life Expectancy at Birth (Yrs)[2]	Infant Mortality Per 1,000 Live Births[2]	Literacy[1] (%)
Cook Islands	18.5	1,082	NA	NA	27	9	61	33	NA
Fiji	619.0	1,673	78	3.7	31	7	62	46	64
Kiribati	57.3	665	NA	NA	35	14	52	87	NA
Niue	3.6	890	NA	NA	26	7	62	33	NA
Papua New Guinea	2,944.0	597	43	2.5	44	16	49	125	32
Solomon Islands	217.7	616	NA	1.7	45	12	54	46	NA
Tonga	95.8	458	NA	0.9	NA	10	58	60	100
Tuvalu	7.4	580	NA	NA	24	15	59	42	NA
Vanuatu	114.5	520	NA	NA	45	15-19	50-60	97-107	NA
Western Samoa	155.0	350	84	NA	37	8	62	36	98

Source: (1) The United States and World Development Agenda 1980, Overseas Development Council, p. 156, 158.
(2) South Pacific Commission, South Pacific Economies, Statistical Summary 1979.
(a) Per Capita GNP given in Australian $. Conversation Rate A$1.00=US$1.15 used.

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MORTALITY SITUATION IN THE SOUTH PACIFIC REGION*

by

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MORTALITY SITUATION IN THE SOUTH PACIFIC REGION

A. DATA SOURCES AND LIMITATIONS

A systematic study of trends and differentials in mortality in the South Pacific region is seriously handicapped by the lack of adequate and reliable statistical information. Completeness and quality of the vital registration system in the South Pacific is far from uniform. On the one end, there are countries where vital or civil registration has not yet been institutionalised; on the other, there are countries with a very long history of registration of vital events. Countries belonging to the first category are to be found in the western (Melanesian) part of the region, especially Papua New Guinea and Solomon Islands.[1/] Countries belonging to the second category are mainly to be found in the eastern (Polynesian) part of the Pacific.

Even among countries with a long history of institutionalised registration of vital events, the diversity in completeness and accuracy of the registered events is again extensive. Death registration, especially of infants, in the eastern part of the region ranges from very incomplete and deficient (for instance in Tonga) to almost complete and fairly accurate (for istance in Niue and New Caledonia). In most countries in this part of the region, the death of a deceased person is usually entered in a death certificate certified by a registrar. It may also be noted that

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1/ This does not mean that registration of vital events is totally unknown in these countries. In Papua New Guinea, vital events are entered in Village Books. Also records of vital events have been kept by missionaries, district administrators, local government councils, medical personnel etc. However, the data collecting activities by these persons and agencies are not part of an overall and comprehensive institutionalised system of vital registration, and the information collected by them are usually incomplete and deficient.

recording of vital events is undertaken primarily for administrative purposes, and the derivation of population statistics and estimates is only a by-product of this administrative system and is an activity with a very low priority or no priority at all.

Hospital records of deaths in both categories of countries are also incomplete since they cover only a portion of the population. However, the proportion of vital events covered by hospitals and dispensaries in the eastern part of the region is usually much larger than in Western part. It must also be emphasised that the births and deaths covered by a medical registration cannot be considered as being a representative sample of all births and deaths in that population. However, in some countries in the central part of the Pacific (such as Fiji and Tonga) it has recently been observed that the registration of deaths by the Ministry of Health is less incomplete and deficient than that of the official vital registration system.

It may thus be noted that in most countries of the region, the data from the vital registration as well as medical registration systems cannot be used for deriving basic estimates of mortality. One has therefore to depend largely on indirect methods of estimation based primarly on census data to assess levels and trends in mortality in these countries. In this connection it may be noted that while some countries have a fairly long tradition of census taking, in others census taking is a relatively new experience. Most of the early censuses were merely head counts and did not even provide an age-sex distribution of the population which is the first requirement for any indirect methods.

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B. MORTALITY LEVELS PRIOR TO SECOND WORLD WAR

As noted earlier, data from the registration system are incomplete and deficient to provide reliable estimates of mortality levels in the South Pacific region. Most of the censuses carried out in this region before the Second World War were only simple head counts and did not provide information on the age-sex distribution of the population. However, a rough idea of the mortality situation prior to the Second World War could be obtained from the inter-censal annual growth rate (r) of the populatinn. If it is assumed that fertility rates in the first half of the twentieth century were high and more or less constant and that net migration was negligible, then changes inter-censal growth rates could be attributed to changes in mortality.

A study of the course of r in some countries in the central and eastern parts of the region indicates that before the 1921 censuses, the size of these populations either declined or remained more or less unchanged. If it is assumed that crude birth rates for these countries averaged 40 per thousand during this period, then the crude death rate must also have been approximately 40 per thousand and for certain periods even much higher. In fact, for some periods in the 19th century, crude death rates close to 40 per thousand have been reported. For instance, a crude death rate of 36 per thousand was reported for Tonga for the period 1881-1890.[2/] Given the fact that these rates are based on registered deaths, it may be safely assumed that the actual crude death rate during this period was higher.

An examination of the registered deaths prior to 1921 suggests that the mortality level for most countries have been fluctuating violently.

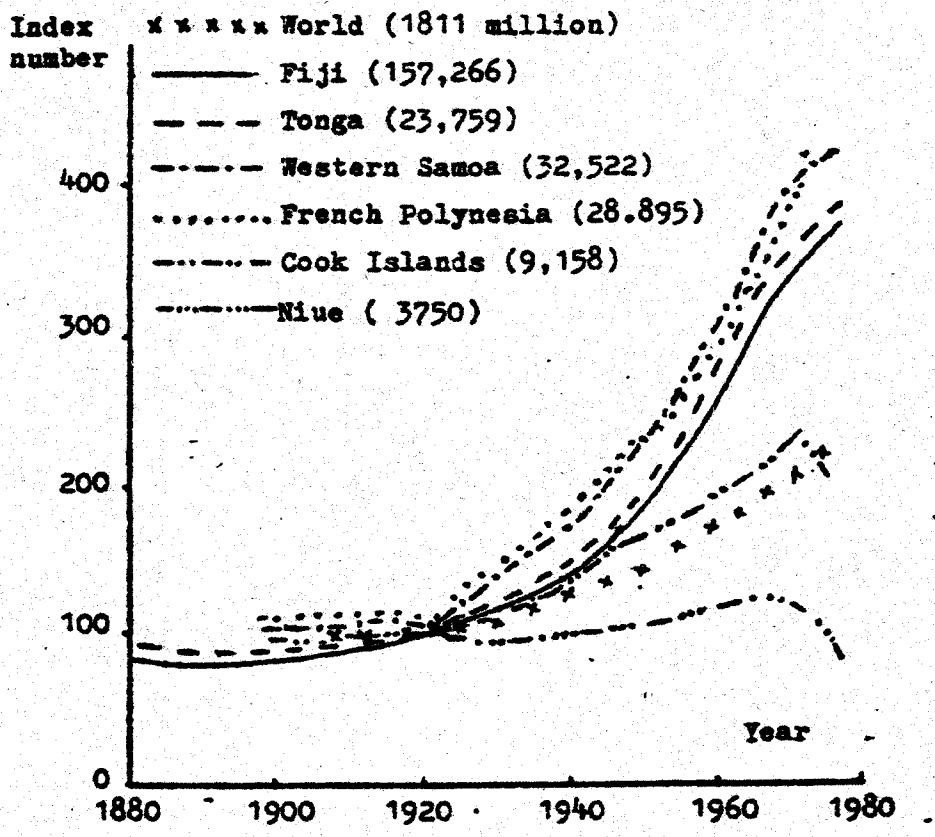
2/ B.H. Thomson, Savage Island (London, John Murray) 1902 p. 179.

No doubt most of the fluctuations have been due to the small numbers of registered events, and differential under registration probably played an important role. Nevertheless, many high peaks in the mortality level in the South Pacific region in the pre-1921 period were caused by diseases and epidemics introduced as a result of Europeon contact. The influenza epidemic of 1919 was the last major epidemic experienced by the countries in the eastern and central part of the region.

Since 1921, there has been an acceleration in the intercensal rates of population growth (r) of many countries in the central and eastern South Pacific. Since fertility did not probably change very much, the acceleration in r must have been caused by declining mortality. The growth of the populations of Fiji, Tonga, Western Samoa, Niue, Cook Islands and French Polynesia are shown in Figure I. In this figure, index numbers have been used to compare the growth of the population of these countries with the growth of the total world population. The 1921 populations were taken as the base, that is, 1921 population = 100. It would be seen from the figure that population growth (and therefore to a certain extent mortality decline) was faster for these countries than for the total world population. In the case of Cook Islands, the growth curve is downwardly biased due to considerable out-migration.

Obviously, the time around the 1921 census after the 1919 influenza epidemics can be considered as a turning point in the mortality history of the central and eastern part of the South Pacific region. For instance, the 3-year moving average curde death rates calculated for Niue[3/] on the basis of registration data between 1902 and 1977 and presented in figure 2

3/ Before the Second World War, death registration was some what more complete in Niue than in other countries.



Note: 1921 population is given in the brackets

Figure 1 Population growth in Fiji, Tonga, Western Samoa, French Polynesia and Cook Islands during the 20th century compared to growth of the total world population.

show clearly the downward trend in CDR after the influenza epidemic of 1918-19. Also the decline in mortality was not gradual. A very high peak, comparable to 1921 levels, was reached during and immediatly after the Second World War, but the 'final' downward trend started thereafter.[4/] CDRs computed from death registration data for other countries included in figure I show the same downward trend after 1921, but registration of deaths in these countries is far less complete than in Niue.

As noted earlier, fully-fledged censuses were not carried in most of the countries in Melanesian and Micronesian part of the region prior to the Second World War and hence intercensal annual rates of growth cannot be calculated. However, the little evidence provided by missionaries, authoropologists etc. seem to suggest that before 1921 mortality in these countries must have been equally high, possibly even higher than in the countries mentioned in earlier paragraphs. Moreover, decline in mortality also appears to have started much later at least in Papua New Guinea and Solomon Islands, and probably also in Vannatu, New Caledonia and Micronesian part of the South Pacific.

There was also a considerable decline in infant mortality after 1921 in the central and eastern part of the region though the rates were still high just prior to the Second World War. In countries like Fiji, Tonga, Western Samoa, Cook Islands, and Niue, the infant mortality rate was certainly over 100 per thousand live births. Even the rate for Tonga based on grossly under-registered infant deaths indicate a level close to 100 prior to Second World War.[5/] Roberts held the view that before and around

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4/ Registration in later years was probably more complete than in the beginning of this century.

5/ M.L. Bakker, A Demographic Analysis of the Population of Tonga 1777-1975, Occasional Paper No. 14, South Pacific Commission, March 1979. p.22.

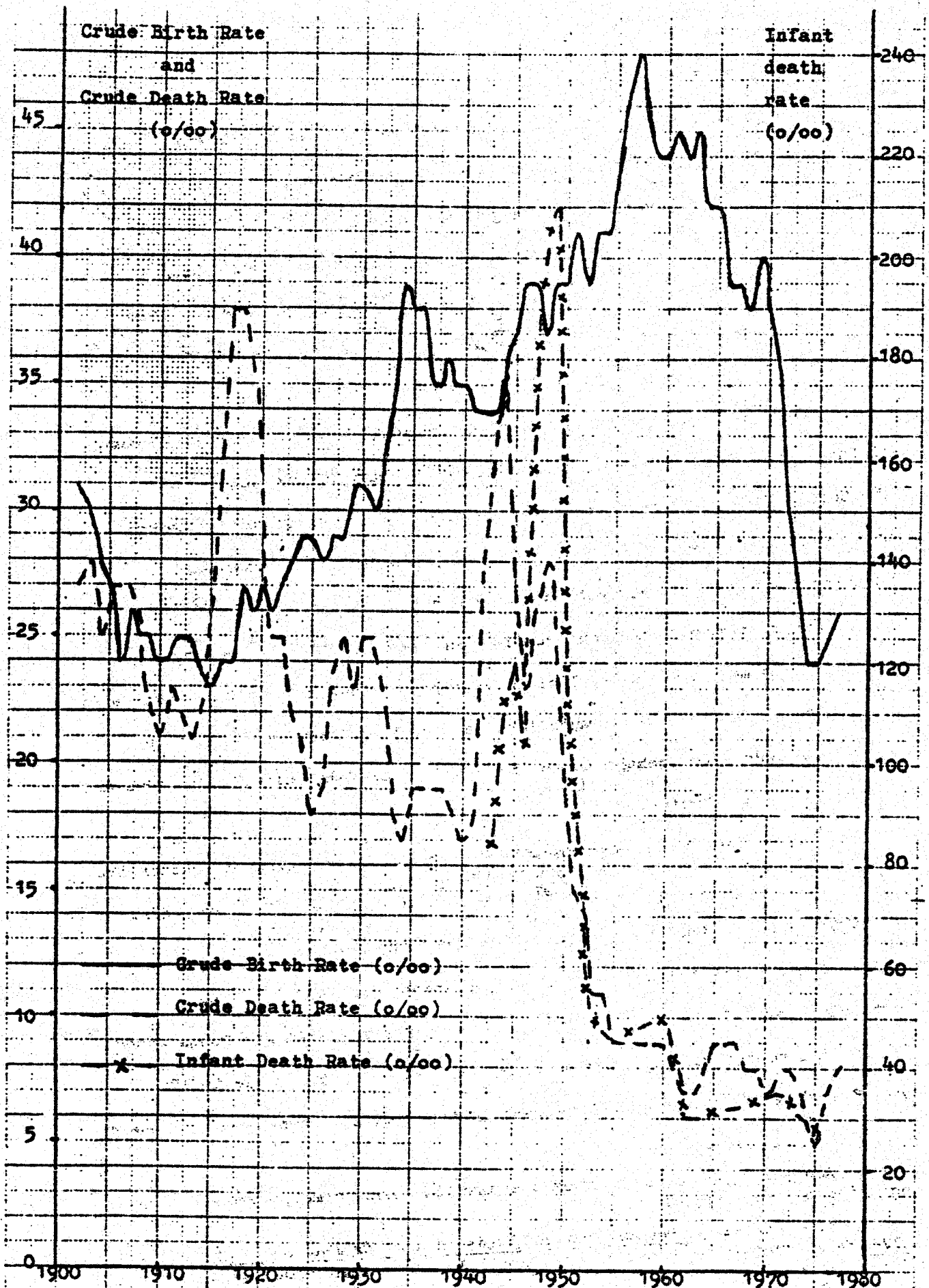


Figure 2 : 3-year moving CBR, CDR and IDR of Niue (all components of the population) as calculated from Vital Registration data.

1927, infant mortality was higher in the Polynesian Ellice Islands (now Tuvalu) than in the Micronesian Gilbert Islands (now Kiribati).[6/]

C. MORTALITY LEVELS AFTER SECOND WORLD WAR

More reliable estimates of mortality could be made for the period after the Second World War, not because there has been and improvement in the completeness and accuracy of vital registration data, but because of the availability of census data from which mortality estimates could be derived.

The available information on mortality suggest a phenominal decline in mortality after the Second World War in most countries of the region. For instance, the average CDR, IDR, neonatal and late foetal death rates for various intercensal periods calculated on the basis of registration data and presented in table 1 show that in Niue there has been marked decline in mortality between 1945-1951 and 1951-1956. The average crude death rates have been 8 and 7 per thousand for the intercensal periods 1966-71 and 1971-76.[7/] Since death registration during the first decades after 1945 was still less complete than at present, the downward trend in mortality in Niue since 1945 is in reality even more pronounced than suggested by data in table I. In the absence of reliable information, it is not clear whether the pace of mortality decline since 1945 has been the same as in Niue.

1. Infant and child mortality

Estimates of infant and child mortality based on Feeney method for selected countries are presented in figure 3. For Niue, the gap between the 1966 and 1976 estimates is fairly large[8/]; the 1956 and 1966 Tongan data

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6/ S.H. Roberts, Population Problems of the Pacific, London 1927, p. 125.

7/ It may be noted that the crude death rates for Niue computed on the basis of census data for the intercensal periods 1966-1971 and 1971-1976 are also 8 and 7 per thousand respectively.

8/ The unadjusted IMRs derived from 1966 and 1976 census data showed considerable chance fluctuations due to small numbers and were therefore graduated. The adjusted IMRS are shown in figure 3.

Table 1: CDR, IDR, neonatal death rate and late foetal death rate, (o/oo), during the intercensal periods since 1945 in Niue (all components of the population)

Intercensal period	CDR	IDR	Neonatal death rate	Late foetal death rate
1945 - 1951	23	151	39	-
1951 - 1956	12	60	28	-
1956 - 1961	9	46	25	22
1961 - 1966	8	28	14	14
1966 - 1971	8	30	14	13
1971 - 1976	7	25	8	21

Source: Based on vital registration data

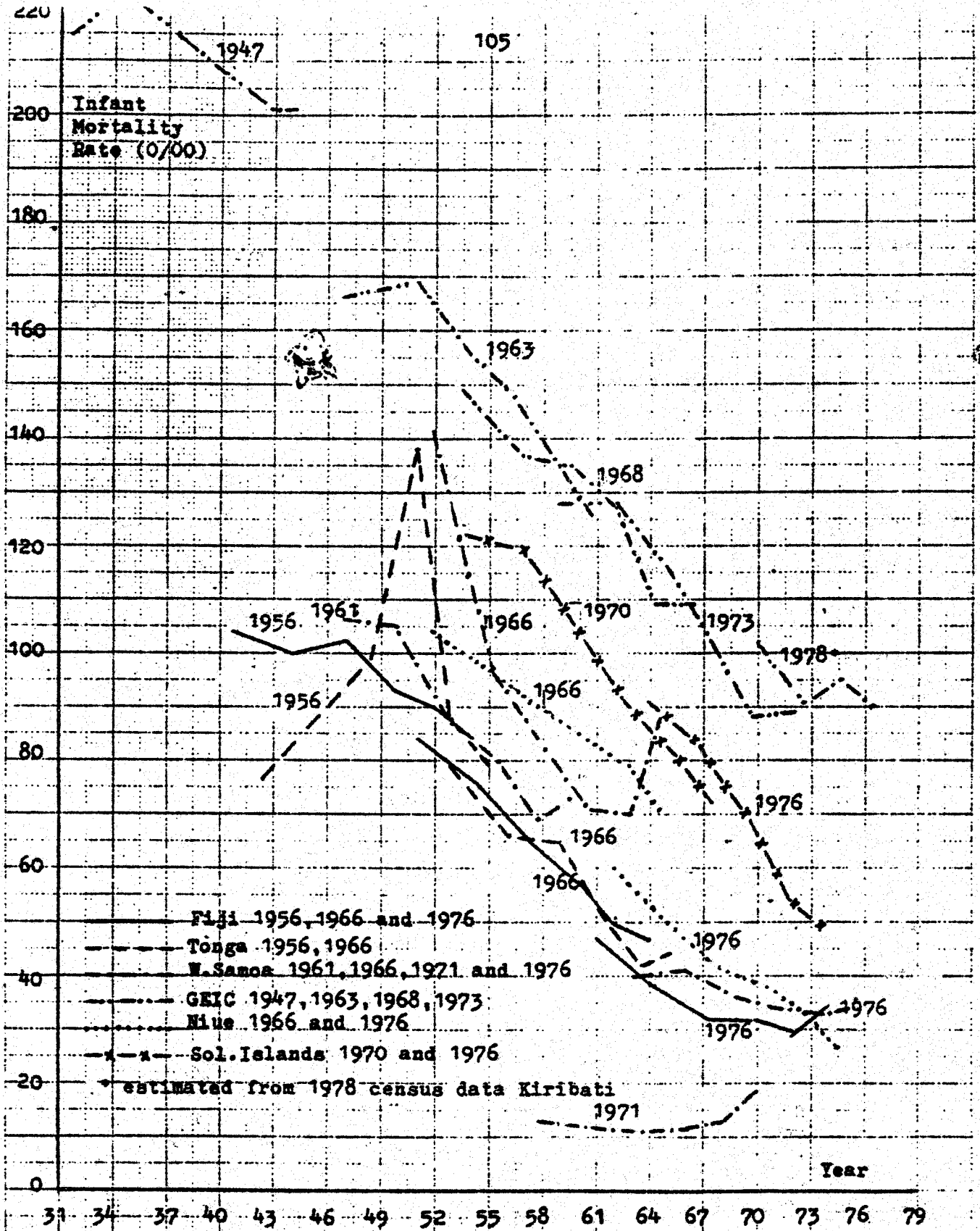


Figure 3 : Estimates of infant mortality for Fiji (Fijian component), Tonga (Tongan component), Western Samoa, GEIC now Kiribati and Tuvalu (total indigenous component), Niue (all components and based on adjusted D_i values) and Solomon Islands (Solomon Islanders only) derived from census data by means of the method of Feeney.

link up fairly well; Though the 1971 data for Western Samoa appear to be totally unreliable, it is clear from the 1961, 1966 and 1976 data that the situation in regard to infant mortality in this country is not very different from the situation in other countries in the central triangle, but probably somewhat higher than in Fiji and Niue and somewhat lower than in Tonga.

The most consistent series of estimates is obtained from the 1963, 1968 and 1973 censuses of Gilbert and Ellice Islands Colony (now Kiribati and Tuvalu). The estimates derived from the 1978 census of Kiribati and the 1979 census of Tuvalu can of course not be compared with those for previous censuses in GEIC, but they are not inconsistent with these estimates. It is clear from the 1947, 1963, 1968 and 1973 censuses of GEIC that infant and child mortality for the Micronesian component of the population was higher than for the Polynesian component. Thus, if the observation of Roberts in regard to infant and child mortality in the Gilbert and Ellice Islands around 1927 was true, it would appear that the situation has now been reversed in favour of the population of Elice Islands (Tuvalu).[9/]

Infant and child mortality estimates based on 1970 and 1976 census data for Solomon Islands are unexpectedly low. The analysis of 1970 data by Groenewegen[10/] and the 1976 census data by Macrae[11/] indicate considerable

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9/ It has been suggested that the difference between Micronesian and Polynesian mortality in Gilbert and Ellice Islands Colony (GEIC) can partly be explained by the fact that in many populations, mortality amongst children ever born (CEB) to teen age mothers is substantially higher than mortality among children born to older mothers and that Micronesian women aged 15-19 have been more fertile than their Polynesian counterparts. See M.F.M. Veltman, The population of the Gilbert and Ellice Islands Colony, 1931-1973 (Groningen Demographic Reports, No.3), Geographical Institute, Groningen state University, The Netherlands, 1980, p. 84.

10/ K. Groenewegen, Report on the Census of the Population, 1970. British Solomon Islands Protectorate, Hobbs, the Printers Ltd., Southampton, 1970.

11/ S.M. Macrae, Solomon Islands 1976 Census, Vol. II, South Pacific Commission, Noumea, New Caledonia, 1981.

Table 2 : Annual rates of decline in infant mortality rates,(o/oo), for corresponding age-groups in consecutive censuses for populations represented in figure 3

Country	Interc. period	Age-group 20-24	25-29	30-34	35-39	40-44	45-49	Mean 20-49	20-45
Fiji	56 - 66	3.6	3.9	3.6	3.6	2.2	1.8	3.1	3.4
"	66 - 76	1.3	2.0	2.6	3.3	3.7	3.7	2.8	2.6
Tonga[a/]	56 - 66	3.5	4.3	8.2	3.1	2.0	-0.3	3.5	4.2
W.Samoa	61 - 66	-0.2	1.8	1.0	1.4	-7.1	-	-	-0.6
"	66 - 76	3.5	3.5	4.4	5.2	9.2	-	-	5.2
"	61 - 76	2.3	3.0	3.3	4.0	4.1	-	-	3.3
GEIC [b/]	63 - 68	2.9	4.4	3.6	3.5	5.2	2.8	3.7	3.9
"	68 - 73	3.8	4.0	4.8	3.5	1.7	3.8	3.6	3.6
Sol.Isls.	70 - 76	3.7	4.3	3.2	3.0	4.0	2.1	3.4	3.6
Niue	66 - 76	4.5	4.6	4.5	4.7	4.8	4.4	4.6	4.6

Notes:

a/ M.L. Bakker, A Demographic Analysis of the Population of Tonga 1777-1975. Occasional Paper No. 14, South Pacific Commission, March 1979, p. 111.

b/ M.F.M. Veltman, The Population of Gilbert and Ellice Islands Colony, 1931-1973, (Groningen Demographic Reports No. 3), Geographical Institute, Groningen State University, The Netherlands, 1980, p. 87. The rates given by Veltman for the indigenous, Miconesian and Polynesian components of the population are as follows:

	Tot.indig.	Micron.	Polyn.
63-68	3.7	3.4	4.2
68-73	3.6	3.7	3.1

differences in the level of infant and child mortality for several districts in Solomon Islands. The results of these two analysis also show that infant and child mortality in the Solomon Islands is somewhat higher than in countries in the central triangle and Tuvalu and much lower than in Kiribati.

In the French territories, questions on children ever born and children surviving have not been included in the census schedule. Estimates of infant and child mortality have therefore to be based on vital registration data. In New Caledonia, where death registration is considered to be almost complete, the average IDR for the Melanesian component of the population during 1967-1976 was 57.2 per thousand births.

No recent data on infant and child mortality for the American territories - Guam, American Samoa and TTPT - are available.[12/] However, the situation regarding infant and child mortality particularly in Guam and American Samoa is probably not very different from that in the central triangle.

Table 2 gives the annual rates of infant mortality decline for corresponding age groups in consecutive censuses for populations included in figure 3. It will be noted from the table that the pace of decline was approximately the same for all populations and that it was independent of the level of infant mortality. The annual rate of decline in the IMR averages 3 to 4 per cent in Fiji, GEIC and Solomon Islands and probably also in Tonga and Western Samoa. Only the average rate of decline for Niue seems to be higher than 4 per cent and this may be partly due to the adjustment procedure which was applied to the Niue data. It would seem that the declining trend in infant mortality gradually levels off when an IMR of approximately 40 is reached and comes to a stanstill when an IMR

12/ Most census schedules in the American territories are modelled on a blue print used in mainland USA and lifetime fertility questions are usually not included in the census schedules of these countries.

Table 3: Child mortality estimates from proportions dead amongst children everborn alive for Fiji, Kiribati, Niue, Tonga, Tuvalu and Solomon Islands.

Population	Census year	Sex	Age 2		Age 3		Age 5	
			l_2	lev.*	l_3	lev.*	l_5	lev.*
Fiji*** (Fij.c.)	1976	m	94800	20.5	94700	20.6	94000	20.4
	"	f	95200	19.9	95900	20.6	95100	20.3
	"	b.s.	95000	20.2	95300	20.6	94500	20.3
Fiji*** (Ind.c.)	"	m	93300	19.4	93600	19.9	92100	19.2
	"	f	94800	19.5	95300	20.2	94200	19.7
	"	b.s.	94000	19.4	94400	20.0	93100	19.4
Kiribati	1978	m	87500	15.6				
	"	f	89300	15.6				
Niue	1966**	m	88941	16.5	87757	16.3	86622	16.2
	" **	f	90625	16.5	89473	16.3	88345	16.2
	" **	b.s.	89754	16.5	88596	16.3	87465	16.2
	1976**	m	95304	20.9	93880	20.1	92151	19.2
	" **	f	96085	20.6	95168	20.1	94120	19.6
	" **	b.s.	95653	20.7	95126	20.1	94603	19.4
Tonga ****	1956**	b.s.	89191	16.1	87218	15.5	85358	15.1
	1966**	b.s.	94840	19.6	93175	19.1	91275	18.3
Tuvalu	1979	m	93400	19.5				
	"	f	94700	19.5				
Sol.Islands	1976	b.s.	93700	19.2	92000	18.4	89000	17.0
	" **	m	92800	19.0				
	" **	f	93800	18.8				
	" **	b.s.	93300	18.9				

Source: For Fiji, See F.H.A.G. Zwart, Report on the Census of Population 1976, Vol. II, Demographic characteristics 1979 pp. 205-212.
For Kiribati, see S.M. Macrae, Kiribati 1978 Census, Vol. II, South Pacific Commission, 1980.
For Niue, see S.M.Kalauni and M.L. Bakker, Niue 1976 Census of Population and Housing, Vol. 2. Analysis of Demographic Data, 1979, p. 169.
For Tonga, see M.L. Bakker, A Demographic Analaysis of the Population of Tonga, 1777 - 1975, South Pacific Commission, pp. 93-105.
For Tuvalu, See S.M. Macrae, Tuvalu 1979 Census, Vol. II, South Pacific Commission, 1980.
For Solomon Islands, see S.M. Macrae, Solomon Islands 1976 Census, Vol. II, South Pacific Commision 1981.

Notes: * Corresponding level in "West" MLT's.

** Either D_i or l_x values have been graduated.

*** Estimates derived by means of Preston method were considered to be superior and the l_2 values estimated by means of this method were used for lifetable construction.
Fijians: males 94,800, females 96,000; Indians: males 94,200, females 95,400 (Zwart, 1979, p. 211).

*** Because of problems mentioned in section 2.3.1.2. no final estimates for 1976 have as yet been made. For provisional estimates see: Bakker and Rikard-Petersen, 1979, p. 7-11.

of 30 is in sight. Fiji, Niue and Western Samoa have now reached this point.

Estimates of child mortality for some countries derived by application of Brass method to proportions dead amongst children ever born alive are given in table 3. The fertility pattern was determined by the indices P2/P3 (for the three youngest age groups) and by the mean age of the fertility schedule, $\bar{m}$ (for the older age-groups). The table includes only the values of 1_2, 1_3 and 1_5 since for the South Pacific region these values are considered as the most reliable, though giving minimum estimates of mortality.

It will be noted from table 3 that the child mortality estimates provide the same picutre as the infant mortality estimates in figure 3 since the estimates are in both cases derived from lifetime fertility data for these countries. A comparison of the two sets of data gives a rather vague indication that in some countries the level of infant mortality is relatively low compared to mortality of children between age 1 and 4. This is for instance suggested by the vital registration data of Niue.[13/] This difference in Niue could partly be explained by the fact that the risk of mortality in the first days of life is reduced to a minimum since virtually all children in Niue are born in the hospital in Alofi, whereas later and especially after breast feeding has stopped, the risk of mortality becomes relatively higher.[14/]

2. Adult Mortality

During the period immediately following the Second World War, methodology for indirect mortality estimation was a poorly developed field and, for sometime, stable population analysis was the only method available to derive estimates of mortality in most developing countries. Unfortunately, no use was made of this method in the analysis of the first

13/ S.M. Kalauni and M.L. Bakker(ed), Niue 1976 Census of Population and Housing, Vol.2; Analysis of Demographic Data, Department of Justice, Niue, 1979.

14/ A part of the difference in infant mortality and child mortality for the age group 1-4 appeared not to be real and were corrected by means of a "stillbirth" correction and a "rounding on age 1" correction. Even after these corredtions there was still a small difference.

Table 4. Estimates of mortality level, stable crude death rate(d), e_0 and e_5 for Fiji, Tonga and Papua New Guinea

Census year	Sex	level "West"	d (0/00)	e_0 (yrs)	e_5 (yrs)
		Fiji (all components)			
1966	f	13.9	14.3	52.1	57.1
		Tonga (Tongan component)			
1956	m	15.1	13.9	52.0	56.4
"	f	14.4	13.5	53.5	57.9
1966	m	14.0	15.5	49.5	55.0
"	f	13.9	14.1	52.3	57.2
		Papua New Guinea (indigenous component)			
1966	m	-	22.4	40.8	-
"	f	-	24.0	39.4	-

Source: For Fiji, see Henry S. Shryock, Jacob, S. Siegel and Associates, The Methods and Materials of Demography, Vol. II, 1973, p. 825.
For Tonga, see M.L. Bakker, A Demographic Analysis of the Population of Tonga, 1977-1975, South Pacific Commission, 1979, p. 56 and p. 63.
For Papua New Guinea, see D.J. van de Kaa, Die Berechnung der Bevölkerungsziffern und die voraussichtliche Entwicklung in Papua-Neuguinea. Jahrbüchern für Nationalökonomie und Statistik, Band 186, Heft 5:419-444 Gustav Fischer Verlag, Stuugart (1972), p. 432.

Note: Quasi Stable estimates.

modern-type censuses of the South Pacific region, although most censuses after World War II provided information on the age-structure of the population in at least 5-year age-groups. However, at a much later stage, data from censuses were used as a basis of estimating mortality levels, but by that time a number of other methods was already available.

It should also be noted that the results of the stable population analysis must be considered as approximate in most cases. Most populations, also in the South Pacific region, have evidently deviated from the stable state during the period after the Second World War, although notable exceptions seem to have been Tonga until 1966 and parts of Papua New Guinea. Unitl quite recently, the populations of these two countries were more or less chosed and fertility had remined almost unchanged at very high levels for a long time.

Inspite of the not very robust character of the stable and quasi-stable methods, fairly reasonable results were obtained by means of these methods in the analysis of census data of the population of Tonga for 1956 and 1966[15/] and the indigenous population of Papua New Guinea[16/] Stable and quasi-stable population analysis was also attempted for population of other island countries such as Gilbert and Ellice Islands, Solomon Islands, Western Samoa and Fiji, but in most cases the results were not published. The results of the analysis for Fiji, Tonga and Papua New Guinea are summarised in table 4.

It is now becoming increasingly more difficult to obtain accurate estimates of adult mortality in the South Pacific region. The stable methods cannot any more be successfully applied to census data in many countries of the region mainly because no accurate migration data of sufficient detail are available. Consequently, estimates of adult mortality must be made by methods based on retrospective and current status questions. Estimates obtained by means of the maternal and paternal orphanhood techniques devised by Brass and Hill are presented in table 5.

15/ M.L. Bakker, A. Demographic Analysis of the Population of Tonga, 1777-1975 (occasional paper No. 14) South Pacific Commission, March 1979.

16/ Kaa, D.J. van de, The Demography of Papua and New Guinea's indigenous population (Ph.D. thesis), Australian National University, Canberra, 1971.

In addition to the estimates given in table 5, estimates of female adult mortality for the Fijian and Indian component of the population of Fiji were also obtained by means of the Brass and Hill technique as well as Preston's "orphonhood" method. The estimates of e_{25} obtained by various methods for Fiji and Tonga are shown in Figure 4.

It would appear that the Preston estimates of e_{25} derived from 1966 and 1956 census data are considerably higher than the intercensal survivorship estimates for the intercensal periods prior to 1966. In the case of Fijian females, it is possible that the Preston estimates of e_{25} are on the high side. Because of the frequent occurrence of adoption in many countries of the region, it seems justifiable to presume that many foster mothers reported their adopted children as own children still alive at the census. However, a considerable number of these children were orphans in reality and this has led to an over-estimate of the number of non-orphaned children. These non-orphaned children are input data for the Preston method and consequently the values of e_{25} must be over estimated for population where the adoption bias had occurred.

In addition to the estimates included in table 5, reasonable estimates of adult mortality for the Melanesian component of the population of New Caledonia were made by application of Brass' intercensal survivorship method.[17/] The average values of e_{25} obtained by this method were as follows.

Intercensal period	Males	Females
1956-1963	-	41.2
1963-1969	-	42.0
1969-1976	43.3	43.8

17/ M.J. Garsen, The Melanesians of New Caledonia: An Assessment of the Accuracy of the Population Statistics, 1956-1976. Geographical Institute, Groningen State University, The Netherlands, (1980)

Table 5 : Estimates of adult mortality for Fiji (Fijian and Indian component), Kiribati, Niue (all components), Solomon Islands (Melanesian component) and Tuvalu by means of the maternal and paternal orphanhood method of Brass and Hill. Standard is GPT. ****

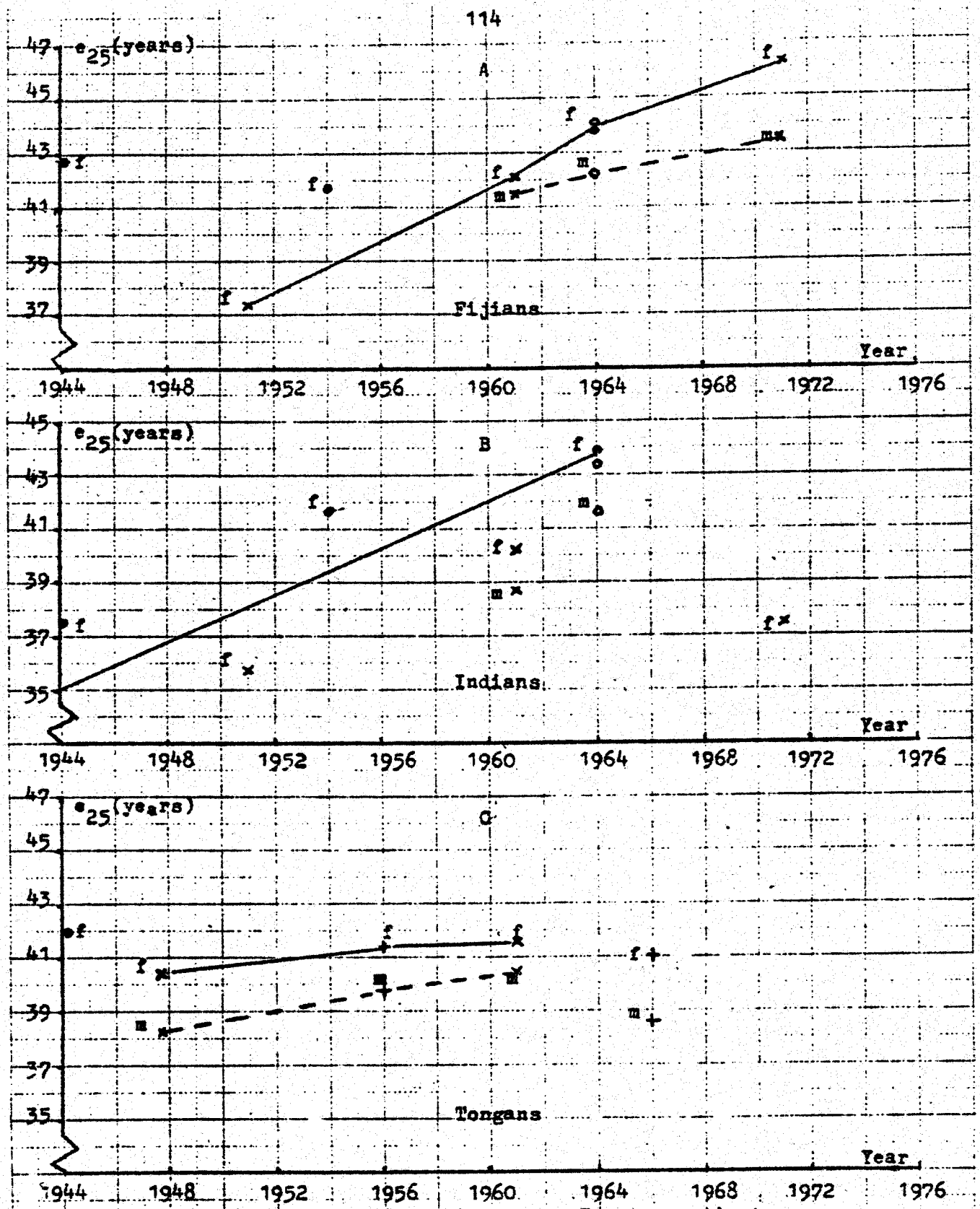
Population	year	Init.val.l_2	α	β	e_0	e_{25}	Source
			Maternal orphanhood				
Fiji,Fij.comp.**	1976	96000	-	1.2400*	-	-	Zwart,1979,p.212-220 and p.144
" (adj)	"	96000	-0.7378	1.1900	63.9	44.1	"
Fiji,Ind.comp.**	"	95400	-	1.2300*	-	-	" and p.146
" (adj)	"	95400	-0.6719	1.1800	62.4	43.3	"
Kiribati	1978	89300	-	1.0300	53.8	40.2	Macrae,1980,
Niue	1976	96085	-0.7533	1.1841	64.3	44.4	Kalauni and Bakker,1979,p.182-193
Solomon Islands	"	93800	-0.3499	1.4100	54.0	36.8	Macrae,1981,
Tuvalu	1978	94700	-	1.2100	60.1	39.9	Macrae,1980,
			Paternal orphanhood				
Fiji,Fij.comp.**	1976	94800	-	1.2700	-	-	Zwart,1979,p.212-220 and p.143
" (adj)	"	94800	-0.6003	1.1900	60.7	42.2	"
Fiji,Ind.comp.**	"	94200	-	1.2800	-	-	" and p.145
" (adj)	"	94200	-0.5497	1.1800	59.5	41.6	"
Kiribati	1978	87500	-	1.0700	50.3	38.1	Macrae,1980
Niue	1976	94628	-0.7090	1.0143	64.3	-	Kalauni and Bakker,1979,p.182-193
Niue (adj)	"	93880***	-0.5894	1.1841	60.5	42.1	"
Solomon Islands	"	92800	-0.3484	1.3000	54.1	37.7	Macrae,1981,
Tuvalu	1978	93400	-	1.2200	56.9	41.7	Macrae,1980,

Notes: * Using the Hill/Trussell regression equations = 1.2600 for Fijian and 1.2200 for Indian females.

** β values considered to be too high. Life tables have been calculated with adjusted β's.

*** l_3 value taken in stead of l_2 value.

****Widowhood method has been applied to Fijian 1976 census data. The results were not consistent and have not been published.(Zwart,1979,p.215)



× = intercensal survivorship estimate; ● = Preston estimate

o = Brass/Hill-paternal and maternal orphanhood estimates

\+ = stable or quasi-stable population estimate

———: females — — —: males

Figure 4 A, B and C : Estimates of e_{25} for the Fijian and Indian component of the population of Fiji and the Tongan component of the population of Tonga for years and methods as indicated.

For Western Samoa, hybrid lifetables developed by Hartmann[18] for 1971-76 gave e_{25} value of 42.3 for males and 44.6 for females.

There are no recent estimates of adult mortality available for the American territories and French Polynesia. Orphanhood questions are not included in the census schedules and inter-censal survivorship methods cannot be applied because of the lack of complete and accurate external migration data.

3. Mortality Differentials

Very little information is available on differential mortality in countries of the South Pacific region. Censuses usually provide separate information for major ethnic groups. Information is usually available for the indigenous component of the census populations and in addition for the Chinese and Europeon components. Nevertheless difficulties of classification arise in regard to such categories as "mixed races", "part Europeons", "half Europeons", "non-indigenous" etc. in the censuses. Moreover, the official registry for vital events and the immigration authorities often do not use the same definitions of ethnic groups. These factors make estimation of mortality for these groups very difficult, if not impossible.

Separate estimates of infant and child mortality were made for rural and urban areas in Kiribati for 1978. The rates appeared to be higher in rural than in urban areas (Tarawa); but it is not certain whether this difference is artificial (differential response) or genuine.[19] Geographically, the rates appeared to be higher in the northern group and lower in the southern group inspite the fact that islands in the northern group are more fertile and receive more rainfall and the people have better food to eat. Nevertheless, these differences could partly be explained by

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18/ M. Hartman, Evaluation of the mortality region during 1971-1976 in Western Samoa, Department of Statistics, Western Samoa, Apia March 1979.

19/ S.M. Macrae, Kiribati 1978 census Vol. II, South Pacific Commission, Noumea, New Caledonia, 1980.

the high incidence of parasatic diseases in the more humid northern islands.[20/]

20/ Ibid

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PROBLEMS OF DATA COLLECTION AND ANALYSIS IN SMALL ISLAND COUNTRIES*

by

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* This paper has been reproduced as submitted. The views expressed in it are those of the author and do not necessarily reflect those of the United Nations or the South Pacific Commission.

Introduction

The title of this paper pre-empts the content; it presupposes that there are problems of data collection and analysis in small island countries which are additional to or different from those encountered in developing countries in general and which therefore merit special consideration. The supposition is a valid one, and this paper will attempt to present these problems to the Conference in as logical and pragmatic an approach as possible so as to facilitate their discussion. To this end, the subject has had, unfortunately but necessarily, to be divided into several parts and the paper written in a somewhat staccato manner.

With the exception of the Maldive Islands in the Indian Ocean, all countries of the ESCAP/SPC region under discussion are located in the Pacific Ocean. The twenty countries* of the South Pacific Commission region occupy, with their 200-mile (320 km) Exclusive Economic Zones, an area of approximately 29 million sq. kms - about the size of the land mass of the African continent. In contrast with Africa, however, less than 2% of the region (551,000 sq. kms) is land, in the form of thousands of small islands scattered like confetti in a vast expanse of ocean.

Many of the islands are coral atolls and some are of volcanic origin, so there is great variation between the countries both in total land area (ranging from Papua New Guinea of 460,000 sq. kms - 84% of the total regional land area - to Pitcairn of 5 sq. kms) and also in the numbers of islands per country (for example, Nuie is composed of only one island; Fiji is an archipelago with approximately 300 inhabited islands (South Pacific Commission, 1978)). Variations within individual countries can also be great. For example, Kiribati is comprised of 22 islands ranging in total land area from 1.4 sq. kms (Banaba) to 388 sq. kms (Christmas Island) (Bailey et al., 1980). These two islands also happen to be at the eastern and western extremities of the country, respectively, and are separated by a distance of approximately 4000 kms.

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* considering the Federated States of Micronesia as one country

The relatively large land mass of Papua New Guinea, and its juxtaposition with West Irian (and its relatively large population - see below) make it debatable whether it should be included in a discussion of small island countries. In some respects, it can be argued that it is more akin to the large land masses of its Asian neighbours than to its small Pacific island neighbours.

The population of the South Pacific region is a mere five million (0.1% of the world's population), with three million of these being in Papua New Guinea. The remaining two million people are unevenly distributed among the other 19 countries of the region, whose populations (in 1979) ranged in size from 619,000 in Fiji to 100 in Pitcairn (South Pacific Commission, 1978, ibid.). Within archipelagos, there is also uneven dispersal of the population between the islands, with the largest numbers generally being on the 'urbanised' capital island of the group. Relating total land area with population indicates a wide variation in population density in the region, both between countries and within archipelagos. The population density for the whole region is nine persons per sq. km (compared with the world average of 30 persons per sq. km) and ranges from seven persons per sq. km in Papua New Guinea and New Caledonia (and eight persons per sq. km in Solomon Islands) to 348 persons per sq. km in Nauru. Within an archipelago, such as the example of Kiribati given above, with an overall density for the whole country of 79 persons per sq. km, the range (excluding Banaba*) is from 1137 persons per sq. km on the capital 'urban' island, South Tarawa, to three persons per sq. km on Christmas Island (although on one islet - Betio - of South Tarawa, the population density is 4959 persons per sq. km) (Bailey et al., 1980, ibid). The archipelago of the Maldive Islands in the Indian Ocean occupies a total land area of 300 sq. kms. The population of 143,000 live on approximately 200 of the islands, giving an overall population density of 473 persons per sq. km (United Nations, 1979).

Pirie (no date) observed that "their scattered distribution, their varied forms and their unique histories contribute to a diverse form, in which the workings of social and economic processes can be studied with a precision and clinical isolation scarcely matched in other research locations. These advantages have been

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*as the high density recorded at the census has subsequently been much reduced with the ending of phosphate mining and the repatriation of workers to their home islands.

utilised by many working in the life sciences, and among the social sciences, notably anthropologists. The region is seen here as offering no less a laboratory for demographers attempting to understand the complex relationships which determine the workings of vital processes". But the governments also need to be aware of the overall advantages of and reasons for having reliable information on demographic events occurring both in their countries and, for the Pacific island countries, within their region.

The Need for Demographic Data in Small Island Countries

WHAT?

For full information, each country needs two types of demographic data (Khalifa, 1978):

stock statistics: which provide an 'inventory' of the population (its size; geographical distribution; demographic, social, cultural and economic characteristics; and housing conditions) at certain intervals;

flow statistics: which indicate the changes which occur in the stock through increase or decrease and also in the compositional and structural characteristics between two 'inventories'.

Stock statistics come from censuses and occasionally from surveys; flow statistics come mainly from vital registration of births and deaths and also from immigration and emigration records, family planning statistics, health and education records,etc.

WHY?

It is considered (Khalifa, 1978, ibid) that demographic data are needed for three principal purposes:

1) policy guidance, planning and projections;
2) identification of current demographic trends and action programmes based thereon;
3) scientific study of the inter-relationships between demographic phenomena and socio-economic development factors at a micro and macro level.

These requirements hold in all countries and are particularly relevant in small island countries because of the exceptional circumstances prevailing in most of them. "Without knowing the problems, planning cannot be done; without planning ahead, implementation of programmes cannot be done, and implementation of plans should be properly evaluated"(Solomon Islands, 1978).

Information from a small island country is still primarily of use to the country itself, but it is additionally valuable if it can contribute to the information on the region of which the island country is a small part. "The growth and development of the island populations of the Pacific region can be better understood if the levels and trends of fertility and mortality are known. These (in conjunction with information on migration) provide basic demographic indices which are the cornerstone of all development planning and related aid inputs. With an increasing awareness of the need for good population data, the optimal utilisation of such information as is available (often obtained at considerable cost to external donors) is of great importance. ... Utilisation of such information can extend far beyond the country's immediate needs of development planning" (Macrae, 1981a).

WHEN?

Demographic data are required now and continuously in the future. The data needed will vary between countries according to the priorities perceived by each government within the constraints of time, finance and resources. UNFPA Basic Needs Assessment Missions (to date to Tonga, Solomon Islands, Kiribati, Fiji and Maldive Islands) have aimed to assess the needs of those countries and to determine priorities both for the nature and format of the information required and also of the method and timing of collection. In addition, the main priorities could be determined and standardised on a regional basis, with the aim of achieving an equivalence both in time and of content.

HOW?

Demographic data are intrinsically of no value; it is the information derived from them - through processing and analysis - that is required. This information should be readily available to all potential users in a format which is comprehensible to the user - be it a statistical census report, summary charts and figures, a popularised version of a formal report, in seminars and talks, etc.

WHERE?

The information derived from demographic data (and often the basic data themselves) needs to be widely disseminated - locally, nationally, regionally, and internationally - according to the information in question. It is considered that in the

Pacific region, stock statistics (particularly census data) and what flow statistics have been collected (particularly data on migration) could be made available in a regional centre - such as the South Pacific Commission or the University of the South Pacific - as well as in the country itself.

WHO?

Such data and information are required primarily by Government planners (both local and national), policy-makers, regional advisers, demographers at academic centres both within and outwith the region, international aid agencies, etc.

Stock Statistics

CENSUSES

Stock statistics are obtained primarily in/from censuses. "A census is the total process of collecting, compiling, evaluating, analysing and publishing demographic, economic and social data pertaining at a specified time to all persons in a country or well-delimited part of a country" (United Nations, 1967).

Problems associated with the collection, processing, analysis and dissemination of census data in small island countries

COLLECTION

These have long been recognised - at least for the Pacific region - by McArthur (1969) who considered that the problems were "essentially no different from those of census operations anywhere in the world. The scale of the enumeration may be smaller and for this reason some aspects of organisation there may be easier than elsewhere and others more difficult, but the smooth running of an operation which involves the whole population of an island group requires the same careful planning and foresight as censuses anywhere".

WHAT?

The Meeting of Census Planners at the South Pacific Commission in 1975 agreed that, with reference to censuses in the Pacific region, it was "advisable to adopt common concepts, definitions, classifications, forms of presentation, and

procedures, wherever possible. They considered that this standardisation would lead to improvement in the comparability of population census data between the countries and territories of the region and with other regions. ... Such standardisation would have to be subject to the special circumstances and particular needs of each individual country or territory and that account must be taken of the prime importance of being able to make within-country comparisons with earlier censuses and other surveys"(Groenewegen, 1979).

In determining what data should be collected, individual governments should be aware of the need for comparability in the region, and design the content and format of the census questionnaire accordingly. However, it is no easy matter to satisfy the needs of the country itself, let alone consider the region as well, and the problems encountered in Kiribati are probably typical: "The main divergence was between those who desired a simplified questionnaire and the quick production of a fairly basic report, and those who considered that the heavy expense of a census could be justified only if the full range of questions recommended by the United Nations was included, and the opportunity taken to obtain as much information as possible, especially in those fields with which economic development was concerned"(Bailey et al, 1980, ibid). To aid the selection of data to be collected, it is suggested that there be a core questionnaire, based on United Nations recommendations, of the few basic and essential demographic questions required. These should be of a standardised content and include questions of specific relevance to the region - for example, on migration. A selection of optional questions (also standardised) can then be added according to the needs of each country. Finally, limited additional, possibly non- demographic questions (for example, on housing) can then be added (not necessarily each time a census is conducted) to suit the needs of the individual country. Questions related to socio-economic development have proliferated in recent years, and these have caused particular problems for censuses in small island countries. Most of the classifications of occupations and industries designed by international agencies "are too detailed for such small populations and too sophisticated for territories with scant industrial development"(McArthur, 1969, ibid). They therefore have to be considerably modified - frequently a difficult task.

It is not only the content of a question which has to be standardised for regional comparisons but also the format. Years of experience with censuses in

developing countries have determined the optimal formats required to elicit the most accurate answers on a topic and those which are also appropriate to the demographic techniques of analysis that are available. Hence, both the core questions and the optional questions should be asked in the recommended formats, for example, 'date of birth' instead of 'current age'. In Kiribati and Tuvalu, an unusual step was taken at the time of the censuses, which is thought to have improved the reporting of dates of birth. 'Birth cards', copied from birth registration records, were distributed to those surviving persons who could be found, and these cards could corroborate the information given by the respondent(Bailey et al.,1980,ibid; Macrae et al,1980). For small populations, this approach is feasible and could be adopted by other countries with birth registration data, even if the data are known to be incomplete.

Despite the recommendations of the 1975 Meeting of Census Planners, there was still divergence between countries in the content and format of the basic questions asked in those censuses conducted in 1976/77. For example, the French territories (French Polynesia, New Caledonia, Wallis and Futuna) omitted questions on fertility and mortality from their censuses as they considered their vital registration to be of sufficient accuracy to provide the required information; and in Tonga and Western Samoa, where there is known incomplete vital registration and migration statistics, the set of fertility and mortality questions used were not those recommended, so the derived estimates of births and deaths were unreliable. This divergence in the 1976/77 census round partly reflected the special needs of each country, but also showed an "insufficient awareness of the advantages of standardisation and of the developments in other countries in the region"(Groenewegen, 1979, ibid).

WHY?

In small countries, demographic information can only be collected in a national census, since sample censuses would not produce the required reliable results on such small populations. Appropriate questions in these censuses are therefore the prerequisites to the determination of the required information. Planners have continually to study the local, national and regional needs for

each question, particularly since the overall financial costs of the census increase with each additional question. Per capita costs of recent censuses in some small island countries have been high: for example, approximately US$1 in Nuie in 1976 (Nuie,1978), US$1.30 in Solomon Islands in 1976 (Solomon Islands, 1980), and a phenomenal US$5.30 in Tuvalu in 1979 (Macrae et al, 1980, ibid) for local costs only - this would rise to approximately US$7 per capita if the hidden costs of consultants, etc were included.

WHEN?

"The Meeting of Census Planners in 1975 indicated 'a strong preference for frequent censuses, preferably at about five-year intervals'. Frequent censuses were considered necessary because of the rapid population changes taking place in the region, and the five-year time span between censuses was advocated because it allows easy cohort analysis from census to census when the results are tabulated according to the usual five-year age groups"(Groenewegen, 1979, ibid). If ten-year intervals are chosen, the populations are too small to permit meaningful inter-censal sample surveys.

A defined periodicity of censuses is of great importance to the country concerned, but within the Pacific region, this periodicity has varied; for example, Fiji and Tonga hold censuses every ten years in years ending in digit 6, while the ten-year intervals in American Samoa and Guam are in years of digit 0; Nuie and Western Samoa hold five-yearly censuses in years of digits 1 and 6, while the five-yearly intervals in Kiribati and Tuvalu (previously the Gilbert and Ellice Islands Colony) have been in years ending in digits 3 and 8(or 9). Other countries, for example, New Caledonia and Nauru, hold censuses "when the spirit moves them"(Pirie and Groenewegen, 1973). Recent censuses in the Maldives were held in 1974 and 1978.

The countries of the Pacific region have to consider standardising not only the periodicity of their censuses by also the years in which they are held, if they wish to reap maximum benefit from the exercise and to contribute to a regional understanding of the demographic situation. As early as 1956, the value of simultaneous censuses was appreciated and McArthur did persuade several countries to take their censuses in the same year. It is to be hoped that extensive simultaneity can be achieved in the 1980s et seq. However, such an ideal situation is not without its practical problems. Most small island

countries still rely on external advisers and financial support from international agencies or as bilateral aid, and it may not be possible for these to be available to many countries in any one specific year, although such constraints may hopefully be overcome in the near future.

Timing of the census within the year chosen is also of particular importance locally. For example, the hurricane season (because of the increased risks of inter-island travel in archipelagos) and the school terms (because of the unavailability of students and/or teachers as potential census enumerators) should be avoided. The latter factor is also a particular problem in a de facto census of a small population as the large proportion of young people living away from their home islands during term time has a greater distorting effect on the results when studied by island than it would have in a larger population.

Finally, there is also the problem of when to include some of the additional questions in the census schedule; those on economic status or housing, for example, may not need to be included every five years.

HOW?

Many of the problems of logistics which beset the conduct of all censuses are especially prominant in island groups, and those concerned with communication and travel are the most intractable. In an, albeit large, Asian mainland country, most travel can be by road and rail,so it is not so subject to the vagaries of weather and to transport limitations as is travel by sea (or air). In Tuvalu, for example, at the time of the 1979 census, "there were no air-links between the islands and only one inter-island boat which plied at irregular, infrequent and unpredictable intervals between the islands. Perhaps most difficult of all was the limited communication between the census offices in Kiribati and Tuvalu, since the air service between South Tarawa and Funafuti was only fortnightly and such that there had to be a monthly interval on correspondence. With the census commissioner in Kiribati having overall supervision of the census in Tuvalu, it was at times somewhat difficult to do this effectively"(Macrae,1981). The vast distances between islands of one archipelago also cause great problems. For example, in Kiribati, several hundred kilometres separate many of the islands from the administrative centre of South Tarawa, with the most remote being Christmas Island, 4000 kms east of Tarawa (across the International Date Line

which further complicates matters). Within some of the larger islands, for example the interior of Viti Levu in Fiji or of Malaita in Solomon Islands, there are additional problems of travel to the remote and sparsely-located populations which are generally only accessible on foot(or by helicopter). Within archipelagos of several hundred small inhabited islands (for example, Maldives, Fiji), it is still difficult for one enumerator to cover more than one, or a very few, islands because of the limited travel facilities available.

One-island countries such as Nuie have fewer problems of logistics relating to their topography than have archipelagos, but all these countries have problems relating to their isolation and the infrequency (or lack, as in Tokelaus) of international air flights to bring in regional and international advisers.

It can therefore be readily appreciated that it is exceptionally difficult to supervise the various stages of the census operation - mapping, pretesting, enumeration, etc. - particularly since communication by two-way radio or radio telephone is not always possible. Hence, greater reliance has to be placed on really adequate training of all field staff who, whatever the expense (and it is high), must be brought to the administrative centre for this. Despite these problems, the use of enumerators is still recommended, as it seems unlikely that the people of the countries under discussion will be able to complete their own questionnaires formany years to come. However, as some compensation; in these populations there are relatively few people to count and, being on small islands, they are less likely to 'escape'enumeration.

One of the consequences of these problems is the practice which has developed in those Pacific countries which conduct de facto censuses of having 'two-visit' censuses - the first visit to ascertain the full details of the members of the household (the data being collected over a reasonable period of a few weeks]; the second brief visit on census day to update the information. If this second visit were combined with a day's curfew, the data could be updated even more quickly, though it is possible that more enumerators would then be required.

Finally, governments need to cooperate and coordinate their activities with their neighbours of the region - far-flung or not. Their large Asian

neighbours have no need to coordinate their activities with neighbouring countries, as their populations and resources are large enough for independent study. As demographic data collection is an expensive operation, it is necessary for the region to combine forces and to coordinate planning so that scarce resources can be utilised maximally and also so that information can emerge for the region as a whole and therefore for a substantial number of people.

WHERE?

The Meeting of Census Planners in 1975 considered that enumeration on both a de facto and de jure basis would be "desirable, if feasible. It was thought that a de facto count was likely to be more accurate than a de jure one, but that a de jure count was more useful for such administrative purposes as the preparation of electoral rolls"(Groenewegen, 1979, ibid). The method of enumeration has, however, continued to vary both between countries and sometimes within a country (for example, Tonga, where the 1966 census was on a de facto basis and the 1976 on a de jure basis). These variations particularly within a country, should be minimised.

WHO?

- should be enumerated? Demographic data should be collected in small island countries on the entire population and not just on a sample.

- should do the enumeration ? McArthur (1969, ibid) summarised the problems well: "In islands chronically short of trained personnel (especially of people with some statistical knowledge or experience), who can be spared for a year or more from their normal duties to prepare and supervise the basic collection of data? Even though some advice may be available to the government on how the enumeration should be conducted, the efficient organisation on the ground requires familiarity with the people and the topography of all of the islands in the group (and more extensive knowledge of those islands or areas likely to prove difficult of enumeration) as well as conscientious administrative skill and a latent Machiavellian determination to brook no opposition. All too often the people with such qualifications are - perhaps rightly - believed indispensible to the positions they hold and if occasionally one is pried loose to run a census, either the experience is so traumatic that he is unwilling to repeat it or by the time the next census is due he has been promoted and is therefore more indispensible than ever". The Census Planners' Meeting stressed

the importance of each contry selecting a suitable Director of Census, and they favoured the appointment of "an experienced administrator with a good knowledge of the region, who should be advised in census design and analysis by a demographer or technical expert"(Groenewegen,1979,ibid). The meeting also suggested the constitution of a national census committee to direct each census; these ideas were followed to a varying extent in the censuses of 1976/77. Most countries have had advice from the demographers at the South Pacific Commission, and it is recommended that this continues with (since the workload is heavy) a possible increase in the number of demographers available at the South Pacific Commission or somewhere else in the region, for example, the University of the South Pacific. When experts from outwith the region have acted as advisers, they have sometimes - by introducing systems they were familiar with at home - contributed to diversity rather than uniformity in the Pacific island censuses (Groenewegen,1979,ibid), and this is to be discouraged.

"Another personnel problem in small populations is the comparative lack of persons competent to act as enumerators and supervisors, either in areas remote from the administrative centre or throughout the group. ... Perhaps the most difficult problem is to convince governments and others responsible for collection of data in the Pacific area that the quality of data collection always depends on the calibre of all personnel involved in its collection - and hence the person who can be spared most easily from one job should be the last to be entrusted with any such responsibility"(McArthur,1969,ibid).

PROCESSING

WHAT?

All the data collected in the census should be processed. As in all censuses, extensive editing and checking is required and this is usually done manually in the country itself. In this respect, it is an advantage to be dealing with a small population as the task is less formidable than that in, say, large Asian countries. Some inconsistencies, as in Tuvalu, were resolved in a "somewhat unorthodox manner, by, for example, asking a clerk to ask his mother if her neighbour.... This was considered not a breach of confidentiality but merely proxy reporting"(Macrae,1981,ibid). After editing, the tabulations should be processed in order of priority. The basic data should be available for

subsequent processing of tabulations additional to these predetermined ones and required, for example, for future research or regional comparisons.

WHY?

"No matter how thorough and accurate the census enumeration is, the census tabulations will not be accurate and useful unless the raw data are properly processed"(United Nations, 1967, ibid).

WHEN?

The census data should be processed as soon as possible after the date of the census. This requires much advance planning to ensure that processing facilities, whatever and wherever they be, are available at the time and for the period required. In the past (and sometimes the recent past), some Pacific countries have suffered long delays in the processing of their census data (especially when done by overseas computer contres), which have diminished the value of the results to planners, etc. An objective of all census personnel should be to reduce such delays to the minimum. With respect to the data themselves, they should be processed in order of priority - i.e. basic/core questions, additional questions and finally the country-specific questions. Since the information from the first two types of question is required from each country in the region, the processing can be standardised, if the questions have been. This would greatly facilitate and speed the procedure.

HOW?

Census data can be processed by hand or by computer. Although several of the countries under discussion have processed the data of their recent censuses by hand (for example, Cook Islands,1976, Kribati, 1978), it is strongly recommended that no further censuses be processed in this way. Although it is true that manual processing done within the country is feasible in these small communities and is cheaper and locally labour-intensive (though only for short periods at infrequent intervals), and is possibly no slower than by other processing methods available in the region, there are many over-riding disadvantages. Hand-processing is extremely laborious and tedious and greatly prone to human error. It is therefore difficult to obtain additional or modified tabulations during processing and virtually impossible to do so after manual processing

has been completed. Hence, "no further analyses of these data which may be required for the country (for specialised studies, for foreign advisory missions, etc.) or as part of a regional study (for example, of migration) can readily be done. Thus the potential of the data is not fully realised and their value as historical records is lost"(Macrae, 1981b, ibid). It is recommended that hand-processing not be employed again but that computer-processing be utilised (see below). This latter method also suffers from its faults, delays, etc., but it is still preferable to have census data captured and stored on magnetic disks or tapes, and so widely available for future use.

WHERE?

Census data from the Pacific region can be processed at a computer centre in an overseas metropolitan country, at a centre located within the region, or in situ. Earlier censuses , if processed by computer, were processed exclusively overseas (for example, the data from the 1956 Census of Fiji were edited and coded in Fiji but processed in Australia (McArthur,1967)), since there was no data processing equipment in any of the island territories. Even data from many of the recent censuses (in coded or uncoded form) have been sent overseas for processing (for example, Solomon Islands 1976 Census to University of Auckland, New Zealand). The size and type of computer in use at these centres is obviously outwith the control of census planners in the Pacific region. Use of overseas facilities has however often suffered innumerable delays, and a regionally-located census computer centre - for example at the South Pacific Commission, at the University of the South Pacific or at the Fiji Computer Centre - may be preferable. However, the schedules (or code sheets) still have to be transported there and "shorter journeys in smaller boats do not necessarily lessen the risks of loss or damage in transit"(McArthur,1969,ibid), though code sheets at least could be transported by air. The advantage of a regional computer centre is that it would be able to prepare and retain programs for the basic/core tabulations of all censuses, with minimal (preferably no) alterations to the programs for each country's data. The work and therefore the time involved would be much reduced.

The third possibility is for the data to be processed in situ. For this, and for the small populations under study, a micro-processor, such as an APPLE III or CROMENCO system Z-2H would be adequate (Cook,1981). "Micro-processors represent

an instance where high technology is most appropriate to the situation of a small developing country. These computers are small, lightweight and inexpensive ... and easy to use. Yet they are also capable of processing data on a par with larger and much more expensive computers"(Cook,1980). The suitability and success or otherwise of using micro-processors in the country itself is currently being assessed on data from the recent censuses in the Cook Islands and in Nuie. Governments could consider buying such micro-processors for their permanent use, renting them for the period of the census only (in both instances using their own staff) or they could agree to receive a peripatetic team of trained personnel with one or several micro-processors. The arguments for buying a micro-processor are always that it could be used for processing of other statistical/financial data in between censuses(assuming the local computer staff remain available). However, in practice, since these other data are 'flow' data requiring continuous and regular processing, the reverse situation would prevail and it would be difficult if not impossible to release the micro-processor for many months of census work. If a micro-processor can be rented, then it can indeed be used exclusively for census processing, but in both cases local staff have to be extensively trained in its use and (if the micro-processor is rented) will use their newly-acquired skills for only a few months and then not again for at least five years. If a regionally peripatetic team of trained personnel, with perhaps several micro-processors,worked on the processing of all/most Pacific censuses, the processing would be quicker (because of practised and experienced personnel, the availability of several micro-processors, and the standardisation of the processing techniques and requirements on a regional basis). One problem with this possibility is that, if countries are encouraged to take censuses concurrently, some countries' data processing will have to be at a delayed interval after the census. However, it is envisaged that such delays would be no greater than those now suffered using other methods or centres for processing and do not outweigh the advantages of simultaneous censuses in the region.

WHO?

If data processing is done in a computer centre or by permanent members of a peripatetic team, then is is presumably being undertaken by experienced personnel. For a country's own micro-processor, training of local staff could be a difficult job and the staff would require continual supervision by external advisers throughout the period of the processing. The current experiences in Nuie and the Cook Islands will be instructive.

ANALYSIS

WHAT?

All the data processed should be analysed. The analyses are only as good as the data on which they are based and the accuracy of the data becomes evident at this stage, and may sometimes limit the range of analyses possible.

WHY?

Analysis is the last stage in the chain following data collection and processing, and leading to the production of information on demographic events in the country. The whole exercise is wasted if no analyses are done on the processed data.

WHEN?

As with all other stages subsequent to census day, the analyses must be completed as soon as possible, as much of their value is diminished by increasing delays. The basic/core analyses should be completed first, and the immediate requirements of the government fulfilled.

HOW?

Demographic indices are determined indirectly, but the small numbers involved often preclude the use of these techniques on an island basis as well as for the country and region. Analyses by differentials such as education, martial status, etc. are also often precluded.. But some techniques, developed for larger populations, such as the orphanhood and own-children techniques, have worked surprisingly well in some recent censuses in the Pacific, but others, such as inter-censal survival, have not, mainly because of the large random variations caused by small numbers. These small numbers also mean that errors, for example of translation of date of birth into years of age, cannot be corrected proportionally. These small numbers also have to be borne in mind when the data have been analysed and the results are available for use. For example, the infant mortality rate from lifetable analysis given in the report of the 1979 Census of Tuvalu (Macrae et al, 1980, ibid) is 42 per 1000 live births, which implies (approximately) a mere seven such deaths in the country in one year.

Most of the techniques used for the indirect estimation of demographic techniques are manual and require only a pocket calculator. Access to a computer for certain fertility estimation methods and for population projections is, however, desirable.

WHERE?

The location of the analysis is related in some measure to that of the processing. If a regional processing centre were to be established, the analyses could perhaps be done in or near that centre. If the data are processed in situ, so could they be analysed. It is probably not strictly necessary for the analyses to be undertaken within the country itself, and it has been the exception rather than the rule in the past. The demographer, who has probably had little or nothing to do with the census enumeration or processing, has greater understanding of the country if working in situ. But the problems with this arrangement are remoteness both from other demographers with whom to discuss the analyses and also from library and computer (and sometimes good secretarial) facilities. Censuses have also been analysed at centres totally outwith the region, but this seems the least advantageous of all the arrangements.

WHO?

At present, consultant demographers are generally employed for census analysis on a rather ad hoc basis. As an alternative, there could be a demographic centre in the region attached either to the South Pacific Commission, to the University of the South Pacific, or to the East-West Population Institute, though this last (and academic institutions such as the Australian National University or Waikato University) can only be regarded as being located on the periphery of the region under study. This suggestion being a rather remote ideal, as an interim (or even long-term) solution, an increase in the number of demographers working in the South Pacific Commission could be advocated. Such personnel and/or centres could perhaps be funded by international agencies. Unfortunately, it will be many years before a Pacific Islander is qualified to analyse such data. It is to be hoped though that such a person, when trained (as in the current programme at the South Pacific Commission), could work on a regional basis, as within one country his skills would only be required for a few months every five or ten years.

When consultants are used for the analysis of the non-demographic data, it is suggested that they be paid for their contributions (and this to be budgeted for in advance) so that there is some control over the time taken to produce their analyses, and so that the production of the final report is not delayed on their account.

DISSEMINATION

"A census is not complete until the information collected is made available to potential users in a form suited to their needs"(United Nations, 1967, ibid). For ease of comparison of censuses both within countries over time and between countries of the region, the analyses could be presented in the census report in a largely standardised format. This approach was deliberately taken when writing up the analyses of the recent censuses of Kiribati, Tuvalu and Solomon Islands, and the formats closely followed that of the census report of Fiji. Several countries have recently experienced problems over the publication of the census report. Most of these related to where and by whom the report should be printed (and sometimes even typed) and to the finances for this (since by the end of the census, the budget had often already been overspent). It is unfortuante that this stage of the proceedings has contributed to the delayed availability of census information; in some instances it has not been available before the next census.

Finally, future censuses should learn from the weak aspects of those held in 1976/77: the need for improved measurement of the economic transition from a non-monetary to a cash economy; and the need to speed up data processing, publication of tabulations, and analysis of census data, with the goal of making results available at the earliest possible time"(Groenewegen, 1979,ibid).

SAMPLE SURVEYS

National sample surveys can also be sources of stock statistics on demographic events, but these are generally not appropriate for the small populations under discussion. "The Meeting of Census Planners had already observed that 'apart from Fiji and Papua New Guinea, the countries and territories of the region lacked sufficient populations to enable samples to be drawn which would result in worthwhile economies' "(Groenewegen, 1979, ibid). Only Fiji has conducted a national sample survey of fertility (World Fertility Survey,1976), and the 1959 census of the population in Solomon Islands was a sample survey (McArthur, 1959).

Within the region, there is still much valuable information to be gained from small surveys. These can be detailed studies of small groups of people

(e.g. Chapman and Pirie, 1974), studies of small communities on several islands of an archipelago (e.g. Victoria University of Wellington, 1979), national coverage - albeit incomplete (e.g. Macrae, 1979), or regional studies of migration, for example (e.g. Connell,1981). These studies are mostly funded by external sources. Governments can also conduct useful surveys of specified activities, which are mostly of a non-demographic nature (e.g. the housing survey of Honiara in 1976 and the proposed rural surveys,in Solomon Islands).

Flow Statistics

These indicate the changes which occur in the stock, and come mainly from vital registration of births and deaths and from migration records. Flow statistics also include family planning statistics, marriage records, health and education records, etc. The following discussion will focus on the problems associated with the management of a system of registration of births and deaths. "Few territories have adequate vital statistics; most regularly publish highly misleading figures purporting to be information about fertility, mortality and migration. In some, there is as yet no viable system of vital registration (e.g Papua New Guinea). ... Whatever the general situation for demographic data gathering, for mortality it tends to be a little worse. Under-registration of deaths, particularly for the very young and the old, is a general characteristic of Pacific Islands vital statistics systems"(Pirie and Groenewegen,1973,ibid).

Problems associated with the collection, processing, analysis and dissemination of vital registration data

COLLECTION

WHAT?

The over-riding problem which transcends the entire management of such a system is the fact that, for the system to be viable and valuable, ALL births and deaths should be registered. The "collection of data on vital events is hampered by the relative rareness of births and deaths"(Seltzer, 1973,ibid)

and this is nowhere more important than in small highly mobile populations distributed among many small widely scattered islands and communities (some of the latter being in virtually inaccessible hinterland). Taking the example of Nanumaga and Nui in Tuvalu in 1979: in these islands of 600 persons with an annual crude birth rate of 24/1000 and an annual crude death rate of 15/1000, there would be, on average, only 14 births and nine deaths in a year to register. Even if the collection of data on all vital events is a legal requirement, it is particularly difficult to enforce. In addition, "the proportions (of deaths) registered in any one year are apt to vary with the degree of time and energy expended on tracking down unobtrusive deaths. This in turn varies with the availability of resources applied to the system. Since economy measures often hit vital statistics systems early, gathering tends to fluctuate with the general economic conditions of the country concerned, particularly as there appears to be little gain in gathering additional mortality information which has the effect of making the official rates look worse"(Pirie and Groenewegen, 1973, ibid). Even in the relatively large country of Fiji, it seems that only 85% of Fijian births (and 50% of infant deaths) were registered in the period 1948-66 (Goldman, 1975).

Questions on the registration forms should be kept to a minimum, be simple and in clear language. In Kiribati, for example, one question - "issue: living or deceased" asked of the father(sic) - proved incomprehensible to parents and registrar alike and was therefore of no value at the analytical stage. Questions on socio-economic status of the parents of the newborn or of the deceased are becoming increasingly important.

WHY?

Convincing the people of the reasons for the collection of vital registration data is an uphill task. Although they may be persuaded to see the value of registering every birth (the birth certificate being required for school enrolment, for example), it is virtually impossible to convince them of the need to register every death. There is generally little incentive, and sometimes a deterrant (such as a fee for the certificate) to register an event.

WHEN?

Ideally, births and deaths should be registered within a few days of the event, but this is not realistic in the terrain of the countries under discussion and some compromise solution has to be found.

HOW?

In addition to the above-mentioned disinterest that most traditional populations have in registering vital events, "the procedure is difficult to administer. Actually, a national civil registration system is more difficult to establish as a reliable instrument of demographic measurement than are any of the alternative procedures available since, to function effectively, it must provide a means for detecting and recording all events regardless of when in the year or where in the nation each event took place. The task of adequately supervising such a far-flung enterprise is immense, particularly when distances are large, where roads and other means of transportation and communication are poor, and where relatively few vital events occur in institutes or are medically attended. The size of this administrative task, coupled with the low priority usually assigned to registration activities by governmental authorities, has in the past foredoomed most civil registration systems to many decades of uselessness as a measurement procedure"(Seltzer, 1973, ibid). Despite all these problems, the establishment of vital registration systems in some of the countries under discussion is still advocated; for example in Solomon Islands (UNFPA, 1979, ibid).

WHERE?

On a local level, the data are currently generally collected by a registrar in an office to which the informant must go. Alternatively, in a small community, the 'registrar' could effectively conduct a small multi-round survey and visit all homes/hospitals/etc. in his locality on a regular basis to enquire of the births and deaths which have occurred since his last visit and register these. There are advantages and disadvantages of both approaches.

WHO?

A government/local council employee can act as registrar for a small community. Alternatively, a nurse/teacher/chief/etc. could undertake the task,

which is considerably less onerous if the registrar waits to be informed of an event than if he searches it out. But it is difficult to find a knowledgeable person to question about the event, and one who can also report it accurately.

PROCESSING

All the data collected should be processed, although again the problems of small numbers limit the extent of the tabulations and differentials which can be prepared or studied. Processing can be done continuously, with events being notified to a central statistics office every month. With either manual or computer processing, the tabulations for the country can be prepared each month by local statistics clerks. In most of the countries under discussion, the numbers are almost too small to justify processing by computer, but over the years, computer-stored records would become increasingly valuable. It is therefore advocated that, if a computer/microprocessor is available for processing, it be used.

ANALYSIS

As with the processing, the main problems relate to the small numbers involved and therefore to the limited analyses which can be undertaken on annual data (although data aggregated over time would produce valuable information). In the example given previously, the infant mortality rate calculated from census data of Tuvalu is 42/1000 live births, which implies approximately seven infant deaths per annum. If this rate had been calculated from registration data, and supposing that only six of these infant deaths but all the births had been registered, the infant mortality rate calculated would have been 34/1000. Thus the omission of the registration of only one infant death in the country in one year greatly affects the rate calculated from such small numbers. It is therefore even more important for the vital registration system to have 100% coverage in a small population than in a large population where the omission of one event does not greatly affect the resultant rates.

The analyses should be done as an integral part of the statistical programme of each country's Central Statistics Office. Unfortunately, few countries have as impressive a statistics office as that in Solomon Islands (where data are analysed and published as part of a coordinated system of statistics collection) and some, such as Kiribati, have no office at all. Countries cannot hope to have a coordinated programme of statistics collection until such an office is established, and it is quite impossible for there to be any coordination with other countries. The East-West Population Institute has proposed (1980) pursuing work related to the "development of integrated population sytems. Included here would be the development, for all Pacific countries, of systems to record births, deaths and migration. These would link with, and provide a context for, the cross-sectional data obtained from periodic censuses. In general, such integrated systems would be used in national and regional planning. Specifically, they would aid the preparation of population projections, and the regular revision of growth rates and other demographic indices". However, it is considered that vital registration of births and deaths is still of limited value in most small island countries.

To obtain some value even from birth registration records which were known to be incomplete in coverage, a scheme was established in Solomon Islands in 1966 wherein the mother's maternity history was ascertained at the time of notification of birth. From this, information on child mortality could be obtained indirectly (Macrae, 1979;ibid). With the introduction of a new birth certificate, the relevant question concerning number of surviving children was omitted, so such information can no longer be obtained, which is unfortunate as it is considered to be of value and the scheme appropriate to other countries.

Other FLOW Statistics

The most important of these relate to migration. There is high mobility of Pacific Islanders, but very few countries have adequate - if any - records of international migration. For example in Tuvalu, there is an elaborate immigration form - which however is hardly analysed - and no emigration form

whatsoever. It is crucial to any knowledge of population growth of a country for these records to be kept completely. There is at present too little data on migration in the region to permit inter-country comparisons, though a regional study (Connell, 1981, ibid) is underway and there have been other studies in the past. Records could also be standardised in content and format for the region as a whole and analysed both nationally and regionally. On a national level, internal migration is also very important, but is very difficult to monitor. "There is constant and repetitive movement of islanders between home, or natal place, and other areas. Today, there is intensive movement between Pacific and metropolitan countries; between smaller and larger islands; between villages and towns; and between inland and coastal locations. Detailed studies are needed to identify these"(East-West Population Institute, 1980, ibid).

Flow statistics should also be collected on many other aspects: family planning, health, education, marriage, etc. Each of these sets of records has its own special problems of collection and analysis, but these will not be discussed here. They are all on-going statistics which should be collected within the country's - and sometimes the region's - integrated framework of data collection.

In conclusion, it can only be reiterated that small island countries, despite the particularly difficult problems associated with the collection and analysis of all forms of demographic data, should make a determined effort to establish good 'stock' and 'flow' statistics, of a format and content which is comparable with those of other countries of the region. It is to be hoped that they will not be like Kipling's Elephant Child, but that the search for good statistics and information will be continuous and that the "serving-men" will never be "put to rest".

This paper was written while the author was working in Cairo - in 'isolation' from all personnel, data and references relating to small island countries, particularly those of the Pacific region. It is to be hoped that the consequent omissions will stimulate discussion as much as or more than the content.

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POPULATION POLICIES OF THE SMALL ISLAND COUNTRIES OF THE ESCAP/SPC REGION*

by

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THE SCOPE OF POPULATION POLICIES

In the opinion of the United Nations (1973:632), there is no generally accepted definition of population policy. Berelson (1971:173) has included "governmental actions that are designed to alter population events or that actually do alter them", but this definition may be too broad since actions that have an unintended or very indirect effect on population events could be included. For example, one function of the Police Force in Fiji is "to help save lives" and with the creation of a Highway Patrol Unit during the 1975-1979 Plan period the number of road deaths marginally decreased (Fiji, 1980:276-7). To regard the creation of this Unit as a population policy would not be satisfactory because, presumably, the Unit operates mainly to reduce traffic accidents, and very few traffic accidents result in death.

Therefore, it may be simpler to use a narrow definition, confining population policy to population-influencing policies where government actions are intended to influence population growth, size, distribution and composition (see Lucas 1979). Although the narrow definition excludes population-responsive policies (the ways that governments respond to population changes) these cannot be ignored. For example, the rapid growth of the school population may stimulate governmental action to build more schools (a population-responsive policy) and also to reduce population growth (a population-influencing policy). This leads onto the idea emphasised at the 1974 World Population Conference (1975:157) that "Population and development are interrelated: population variables influence development and are also influenced by them".

INFORMATION ON POLICIES

In this paper, reliance has been placed on two sources of information, the most important being those national Development Plans available at the time of writing. The World Population Plan of Action, adopted by the World Population Conference at Bucharest in 1974, recommended that "population measures should be integrated into social and economic plans". Stamper (1977) studied population policy statements in the Development Plans of the early 1970's of 60 developing countries (20 of which were in Asia) and his framework is applied here to the Plans of small island countries in the ESCAP/SPC region. As Stamper (1977:xi) observes, "Like fine old

books, new development plans can be very difficult to obtain - a few are readily available, many are rare and most are out of print". In our case, plans were not available at the time of writing for American Samoa, French Polynesia, Maldives, Tokalau or the constituent states of the Trust Territory of the Pacific Islands.

Stamper comments on the proliferation of development plans during the 1960's. In Fiji (1980:1) development planning began in the 1950's but only in the 1966-1970 Plan was a comprehensive plan developed to look at past achievements and future potential. Stamper gives the following reasons why the five year plan became popular:-

(i) it is a more integrated and comprehensive approach to development planning

(ii) it fulfils a need for a longer range fiscal plan for public investment

(iii) it is often a prerequisite for foreign aid

(iv) it has effective national and international publicity value.

Most of the Plans used below are of the medium range variety (of 3 to 5 years), the exceptions being the short term plans of Papua New Guinea for 1974 and 1976, and Guam for 1980, and the long term "Dijoud Plan" for New Caledonia.

The second source is Volume 2 of World Population Trends and Policies (United Nations, 1980) which is based on the second (1979) round of monitoring of population trends undertaken by the United Nations. As a result of the 1974 World Population Plan of Action, the monitoring of population trends is undertaken continuously as a specialized activity of the United Nations and reviewed biennially (United Nations, 1980:3). One limitation of this approach is that only five of the ESCAP/SPC small island countries (Fiji, Maldives, Nauru, Papua New Guinea, Samoa, and Tonga) responded to this United Nations Population Inquiry.

PURPOSES OF DEVELOPMENT PLANS

Stamper (1977:3) poses the question "what is the use of studying development plans if most of their programs are never fully implemented and they represent an unreal world ....". His responses are:-

(i) plans provide an indication of the use of demographic data

(ii) it is important to determine the perception of various population problems

(iii) The proposed policies (even if never fully implemented) are of interest in themselves. Was the scope of the policy broad or narrow? "In order to evaluate the execution of a program one must know (among other things) what was proposed and what goals were set". For example, as can be noted from elsewhere in the ESCAP region, some plans failed because they made optimistic assumptions about the access to existing health services (see Lucas, 1981)

From the national point of view the purpose of the plan can be seen from the National Development Plan 1979-1982 of Kiribati (1979:13):-

> "The purpose of the plan has been to focus attention and action on future problems and requirements of the country. The ostensible time scale of the present plan is four years, but its preparation involves looking much further ahead to longer term consequences of, say, population growth and migration to the town ...." The 1979-1982 Plan "sets out various principles and objectives, and action programmes to achieve them which are intended to lead Kiribati along a course which will bring the greatest and most lasting benefit to the people of Kiribati as a whole."

POPULATION AND DEVELOPMENT GOALS

A policy implies the existence of goals and if we follow the notion that the main goal of development is improved human welfare then population policies can contribute towards that main goal. However, different countries treat population policies differently in their Development Plans. The National Development Plan 1979-1982 for Kiribati (1979:17) identifies six categories of problem, one of which specifically covers population growth and urbanization. Related to these problems, the Plan list eleven objectives (or goals) one of which is the maintenance of the balance between population and natural resources. The major objectives of Fiji's Eighth Development Plan 1981-1985 include ensuring "that the opportunity for productive and rewarding social or economic activity is available as far as possible for those who want it" (Fiji, 1980:17). One problem related to this objective is the attractions of urban areas pulling away young people from land and sea. In this Plan, a strategy is defined as "a means of implementing desired objectives in the face of constraints or problems" (Fiji, 1980:21),

and one such means is the Rural Development Strategy, where within the framework of the Plan the objectives and strategies for rural development are specified. One specific objective is "to promote the location of development activity outside the Suva-Nausori urban centre as far as possible" and this entails a population policy of "positively developing and promoting Fiji's other urban centres" (Fiji, 1980:335).

THE BASIC NEEDS APPROACH

Per capita income is no longer regarded an an adequate indicator of development or of human welfare, and this is reflected in the more recent Development Plans. Thus Western Samoa's Fourth Five Year Development Plan 1980-1984 makes this comment on the Third Plan's focus on economic growth, "... the overrriding emphasis given to increasing production - and hence GNP - is somewhat simplistic. For example, raising GNP does not promote the welfare of all citizens unless it is accompanied by a reasonably equitable distribution of income". An additional objective in the Fourth Plan is therefore to achieve a more equitable distribution of the benefits of economic development (Western Samoa, 1980:4). Similarly the 1981-1985 Plan for Fiji (1980:26) includes a basic needs policy (dealing with deficiencies in food, shelter, health care, water, sanitation and education and employment) as a new area of policy initiative. As will be discussed later, population growth may affect a Government's ability to meet the basic needs of its population, and out-migration may be the response of persons in areas where their basic needs are not being met.

DEMOGRAPHIC DATA USED IN DEVELOPMENT PLANS

Stamper (1977:9) begins with a discussion of demographic data noting that little is known about how it is actually used in the Third World. He emphasises that in countries experiencing rapid population growth, development programmes must take demographic changes into account. This comment will be applicable to most of the small island countries of the ESCAP/SPC region for, as shown elsewhere, most of them have high rates of natural increase, although emigration has acted as a check on the actual growth rates in Polynesia (see Lucas and Ware, 1981; and Lucas, 1980).

Stamper did not include migration data in his analysis, and so Table 1, although it contains Stamper's six categories of data, has been expanded by the additions of three others: net emigration; rural/urban distribution; and population density. Of the 20 Asian Plans studied by Stamper the most obvious defiency was that only about half included estimates of mortality and fertility (Stamper, 1977: Table 1). Table 1 indicates that these statistics are not available in all the Plans of the small island countries, and that some Plans contain very few of the nine selected indicators.

RECOGNITION OF IMPORTANT PROBLEMS.

In this section, following the path set by Stamper, Development Plans are examined to see if they recognize a number of important problems. As Stamper (1977:5) says, "The objective here is not to determine whether these problems actually exist but to determine how they are perceived by development planners". Because Stamper ignores migration in his discussion, his categorization has been followed in Table 2(a), but an additional Table 2(b), identifying migration-related problems, is included.

A striking feature of Table 2(a) is the general recognition of at least one population problem in the Plans. However, this may be a reflection of a world-wide trend over time (see Stamper, 1977:2) rather than a unique feature of the Pacific island nations. In Table 2(a), the Cook Islands and Niue identify very few of the usual population problems, probably because emigration has resulted in a negative growth rate in recent years. Vanuatu had no tradition of Development Plans before Independence, but is currently assessing its development objectives and strategies.

Table 2(a) gives the impression that some countries which are concerned about the growth of the working age population do not recognize an increase in the school age population as a problem. This could be a logical situation in countries where the school age population is declining, perhaps because of the impact of a family planning programme in the 1970's, or because of emigration (as in the case of Niue).

Very few countries specifically stated that their economic growth is constrained by population growth. In some cases this may be because other factors - such as commodity prices - have a more

obvious influence. Also, as mentioned above, the adoption of the basic needs approach to development has reduced the emphasis on economic growth.

Stamper's category of "population pressure on social and welfare services" seemed rather amorphous and ill-defined and so in Table 2(a) the category has been modified to cover Government services in general, but particularly those related to basic needs. For example, the 1979-1982 Plan for Kiribati (1979:185) states that "Water supplies are one of the dominant constraints of Kiribati, both in relation to population and development opportunities ... The most acute problems of supply arise in urban Tarawa".

With relatively high Crude Birth Rates, sometimes acommpanied by the selective emigration of persons of working age, it is hardly surprising that a high dependency ratio is recognized as a problem in most of the Plans in Table 2(a). Guam, for example, with 40% of its population aged under 15 years, implies that a high dependency ratio may reduce its capacity to save and invest (Guam, 1980:16).

A number of Plans note that high population growth results in pressure on health (and other) services. For example, the 1980-1984 Plan for Western Samoa (1980:93-4) notes that the resultant high demand for health and education services leads to "pressure to channel an increasing proportion of government expenditure into expanding the capacity of these services rather than improving their quality or undertaking more directly productive investment".

Population pressure on housing tends to be an urban problem. In Kiribati most people build their own houses from coconut timber, palms and pandanus leaves, but population pressure has resulted in overcrowding in urban Tarawa (Kiribati, 1979:63 and 267). In Western Samoa (1980:6), "Housing, too, is a basic need but is well catered for through the traditional skills of the people". In Fiji (1980:230-1), the urban and peri-urban population increased at around 3.2% per annum between 1966 and 1976, but the number of urban households grew more rapidly at 4.1% due to the trend towards smaller family sizes. This growth rate in the number of urban households was expected to continue in the 1981-1985 Plan period, with a corresponding growth rate for rural households of 2.8%.

Stamper's category "population pressure on individual or

family welfare" includes the effects of population growth on the health of mothers and children and the distribution of scarce resources among members of large families. Stamper (1977:44) also includes countries which "imply population pressure on individual and family standards of living ...", but this inclusion only renders this category vague and amorphous. In any effect, as can be seen from Table 2(a) this category is not very important for the small island countries of the ESCAP/SPC region.

Finally, population pressure on food or agricultural systems is mentioned in the most recent Plans for Kiribati, Papua New Guinea, Solomon Islands and Western Samoa, and in the 1978-1980 Plan for Tonga. For example, the 1980-1984 Plan for Western Samoa (1980:95) has, as one aim of the proposed population policy, to "ease the pressure on land and facilitate wise management of our natural resources".

THE UNITED NATIONS POPULATION INQUIRY AND PROBLEMS RELATING TO NATURAL INCREASE

In this section we consider the responses of six ESCAP/SPC small island countries (Fiji, Maldives, Nauru, Papua New Guinea, Tonga and Western Samoa) to the 1979 United Nations Population Inquiry. Four countries (Fiji, Papua New Guinea, Tonga and Western Samoa) out of the six considered their rates of natural increase to be too high, and that full intervention was appropriate to reduce rates. All four though that natural increase had a predominant constraining effect on development. Not surprisingly these four countries thought lower rates of fertility desirable, were intervening to lower rates, and were providing direct support for "effective individual fertility regulation".

Of the remaining two countries, Nauru's position was not totaly clear. Nauru felt that full intervention was appropriate to raise its rates of natural increase. Nauru reported that its fertility rates were satisfactory, but at the same time direct support was provided for effective individual fertility regulation. The Maldives was one of the four ESCAP countries (the others being centrally planned economies) which did not provide either direct or indirect support for family planning (United Nations, 1980: Table 5(b)).

MIGRATION

Some of the migration-related problems mentioned in the most recent Development Plans are shown in Table 2(b). This Table distinguishes between internal and international migration. Since Guam is almost totally urban, it has none of the usual problems associated with rural-urban migration.

"Urban bias", in the first column of the Table, refers to the situation where rural people do not receive an equitable share of the country's resources. For example, in Tuvalu (1980:26) "... the concentration of cash income earners on Funafuti, coupled with the fact that once settled on the island few people wish to return to their home islands, has begun to create an 'urban elite' which may in time become self perpetuating to the detriment of those remaining in the rural areas" and "... since separation and independence considerable sums of aid funds have been spent in the development of the infrastructure of Funafuti as the nation's capital". The second column of Table 2(b) refers to the negative effects of urbanization and in Funafuti these include the unregulated expansion of the population, overcrowding, and the associated deterioration of health and social conditions. The remaining two columns related to urbanization refer to the increasing demand for urban employment and the stress on urban services such as water and sanitation.

The second section of Table 2(b) indicates that international migration is of less concern to Governments than internal migration, although, as stated above, the Cook Islands and Niue are special cases. For the Cook Island (1980:6) "not only has the absolute size of the population fallen, but the proportion of the labour force has dminished" because of the higher propensity of males aged 15-29 to migrate.

THE UNITED NATIONS POPULATION INQUIRY AND MIGRATION-RELATED PROBLEMS

Only two of the countries in the ESCAP region reported, to the 1979 United Nations Population Inquiry, that their spatial distribution was acceptable:- one was Singapore, and the other Nauru. Nauru , of course, consists of only one island of 21 square kilometres, and with a population density of 348 per square kilometre.

With the exception of Papua New Guinea, the six responding ESCAP/SPC small island countries "did not perceive that an adjustment in the spatial distribution of population will contribute to the resolution of problems associated with population growth". In spite of this, Fiji, Papua New Guinea, Tonga and Western Samoa perceived their spatial distribution as "substantially unacceptable" or "extremely unacceptable" and Fiji, Tonga and Maldives indicated support for policies to decelerate the migration flow (United Nations, 1980: Table 73).

Nauru and Western Samoa indicated that immigration was significant. Nauru perceived this as satisfactory, but Western Samoa felt it was too high. Both these countries had Government policies in favour of maintaining current rates but subject to strict control (United Nations, 1980: Table 85). Two countries, Tonga and Fiji, perceived emigration as significant, whereas the other four regarded it as not significant. Tonga perceived this situation as satisfactory but Fiji thought it to be too high, and had a policy of curbing emigration in future (United Nations, 1980: Table 91).

POPULATION POLICIES

Once again, because Stamper did not discuss migration, the policy table has been divided into two. Table 3(a) uses Stamper's 16 categories which are "limited to specific policies or programs that are designed to reduce fertility and have at least a partially demographic rationale". Stamper's categories are arranged in order of frequency, and it can be readily seen that the small island countries exhibit a similar frequency distribution. Stamper (1977:44) follows the narrower definition of population policy by excluding policies with an unintended effect on fertility, but indirect policies are included if they have been proposed or discussed in the context of fertility reduction. Stamper also excludes policies influencing mortality or involving migration. The former is a rather vague area since all governments have a health policy which will be related to mortality (see Lucas, 1979:200). The latter is covered in Table 3(b).

Small island countries in the ESCAP/SPC region normally support family planning for demographic reasons, that is, to reduce the rate of population growth. Countries which do not, include those with free access to New Zealand, the United States, or France. Nations such as Nauru (see above) and Vanuatu do provide support for family planning services but presumably do so for non-demographic reasons (such as maternal and child health).

Countries which support family planning for demographic reasons tend to integrate this service into their national health services. This tendency is encouraged by the trend toward primary health care which, according to the 1978 declaration at Alma Alta, includes maternal and child health care with family planning (Douglas, 1980:5). Primary health care is an intersectional activity and, as such, requires special consideration in Development Plans. Since primary health care reduces the emphasis on hospitals and doctors, and concentrates in the spread of basic health care in the villages, it can also be associated with the extension of family planning services. Primary health care includes an educational component, which may incorporate family planning education.

Stamper includes two categories of targets: population growth targets and family planning acceptor targets. The problem with the former category is that emigration can affect not only the growth rate, but also the fertility measures if the emigration is selective by age and sex (see for example, the case of Tokelau, cited by Lucas 1980:158). As mentioned in Lucas and Ware (1981) family planning acceptor targets have proved difficult to meet.

Stamper's last eight categories receive negligible attention in the Plans. Various reasons can be advanced for this. For example Tonga makes use of mass media for family planning information, but does not mention this in the Development Plans. Pacific Islanders have a high age of first marriage compared with South Asians, so policies of delaying marriage to reduce fertility are hardly appropriate (Lucas, 1980:153).

Pacific Islanders tend to have conservative attitudes towards abortion (see Lucas and Ware, 1981:309).

The 1980-1984 Plan for Western Samoa is remarkable because it links status of women with high fertility. For example the Plan notes that women have a crucial role to play in reducing such possible constraints on development such as the high birth rate (Western Samoa, 1980:81).

Pronatalist policies are totally absent from Table 3(a). This is hardly surprising since Stamper (1977:44) found that only one out of the 60 Third World countries he studied included such a policy.

MIGRATION-RELATED POLICIES

If countries consider 'urban bias' or the negative effects of urbanisation to be problems, then one response may be rural development. Of course, to qualify as a population policy, rural development must be undertaken not only for its own sake, but also to reduce urbanization. Fiji, for example, in its 1976-80 Plan had a "two-pronged attack on the problem of urbanisation: first, to improve production, opportunities, and amenities in rural areas; and second, to care for urban population through growth and employment creation, training programmes, and programmes to stimulate construction of housing and other social infrastructure" (Fiji, 1980:336). Another approach was taken in Kiribati, where Christmas Island was identified as an are of special development (Kiribati, 1979:29). Kiribati (1979:59) also considers that "It is the process of education that opens minds to a wider world and aroused discontent with the limitations of island life ...It is therefore essential to develop an educational system that provides for the needs of the community as a whole in both quality and quantity".

POSTSCRIPT

To examine the population problems and policies of 20 small island countries in the ESCAP/SPC region has been a daunting task. Many countries have a whole series of detailed Development Plans, sometimes extending over several volumes. Sometimes statements related

to population problems and policies are tucked away in unlikely sections of the Plan, and some have undoubtedly been overlooked or even misconstrued. For this and other reasons this paper must be regarded as continuously evolving.

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TABLE 1:

Demographic data included in recent national development plans of ESCAP/SPC small island countries

Country	Plan Period	Rate of population growth	Estimate of fertility	Estimate of mortality	Projection of future population size	Estimate of current school-age population	Projection of future school-age population	Estimate of current working-age population	Projection of future working-age population	Net emigration	Rural/urban distribution	Population density
Cook Islands	1980	x	x					x		x		
Fiji	1981-85	x			x	x		x	x	x	x	
Guam	1980	x	x	x				x	x			
Kiribati	1979-82	x		x	x						x	x
New Caledonia	Long term											
Niue	1980-85	x	x	x	x	x	x	x	x	x		
Papua New Guinea	1979-82					x						
Solomon Islands	1980-84*	x	x	x	x	x	x	x	x	x	x	x
Tonga	1975-80	x	x		x	x	x	x	x	x	x	x
Tuvalu	1980-83**	x				x		x				x
Vanuatu	1981	x									x	x
Western Samoa	1980-84	x	x	x	x	x	x	x	x	x	x	x

* Withdrawn

** Not yet approved

TABLE 2(a):

Population problems recognized in national development plans in ESCAP/SPC small island countries

(a) Problems related to natural increase

Country	Plan Period	Recognition of any type of population problem	Growth of working-age population viewed as population problem	School-age increase viewed as population problem	Economic growth reduced by population growth	Population pressure on Government services	High dependency ratio	Population pressure on health services	Population pressure on housing	Population pressure on individual or family welfare	Population pressure on food or agricultural systems	High population density viewed as problem
Cook Islands	1980	x					x					
Fiji	1971-75	x	x	x					x			
	1976-80	x	x	x					x			
	1981-85	x	x	x			x		x			x
Guam	1980	x	x		x		x					
Kiribati	1979-82	x	x	x		x	x	x	x		x	x
New Caledonia	long term	x					x					
Niue	1980-85	x	x					x				
Papua New Guinea	1974											
	1976	x	x	x		x		x	x		x	x
	1979-82	x	x	x					x	x	x	
Solomon Islands	1975-79	x									x	x
	1980-84*	x	x	x	x	x	x	x	x		x	x
Tonga	1970-75	x	x	x			x				x	
	1975-80	x	x	x		x	x			x		x
Tuvalu	1978-80	x	x									
	1980-83**	x	x			x	x	x	x	x		x
Vanuatu	1981	x									x	x
Western Samoa	1971-72											
	1975-79	x	x	x			x	x				
	1980-84	x	x	x		x		x	x		x	

*Withdrawn
**Not yet approved

TABLE 3(a):

Population policies in national development plans in ESCAP/SPC small island countries

(a) Policies related to fertility

Country	Plan Period	Support of family planning for demographic reasons	Integration of family planning with health services	Population growth targets	Extension of family planning services	Socio-economic development and fertility decline	Family planning acceptor targets	Family planning education	Population education	Delay of marriage to reduce fertility	Use of mass media for family planning information	Motivation schemes for smaller families	Policies on abortion	Family planning incentive schemes	Improved status of women and fertility decline	Comprehensive population strategy	Pronatalist policies
Cook Islands	1980																
Fiji	1971-75	x		x	x	x	x										
	1976-80	x	x	x	x		x	x	x								
	1981-85	x	x	x	x		x	x									
Guam	1980																
Kiribati	1979-82	x	x		x											x	
New Caledonia	long term																
Niue	1980-85			x													
Papua New Guinea	1974	x	x														
	1976		x													x	
	1979-82	x	x		x			x									
Solomon Islands	1975-79	x	x														
	1980-84*	x	?		x												
Tonga	1970-75	x			x		x										
	1975-80	x	x		x		x	x									
Tuvalu	1978-80	x	x		x												
	1980-83**	x	x		x		x										
Vanuatu	1981																
Western Samoa	1971-72		x		x			x									
	1975-79	x	x	x	x			x									
	1980-84	x	x		x	x		x	x						x	x	

* Withdrawn
** Not yet approved

TABLE 2(b):

Population problems recognized in recent national development plans in ESCAP/SPC small island countries

(b) Problems related to migration

Country	Plan Period	INTERNAL: Urban bias	INTERNAL: Negative effects of urbanization	INTERNAL: Increased demand for urban jobs	INTERNAL: Increased strain on urban services	INTERNATIONAL: Reduced opportunities for emigration	INTERNATIONAL: Brain drain; selective emigration	INTERNATIONAL: Reliance on expatriate staff	INTERNATIONAL: Reliance on remittances
Cook Islands	1980	x				x			
Fiji	1981-85	x		x	x				
Guam	1980								
Kiribati	1979-82	x	x	x	x	x			x
New Caledonia	long term	x		x	x				
Niue	1980-85					x			
Papua New Guinea	1979-82	x	x	x	x		x		
Solomon Islands*	1980-84	x		x	x				
Tonga	1975-80	x	x	x	x	x	x		
Tuvalu**	1980-83	x	x	x	x	x	x	x	
Vanuatu	1981	x					x	x	
Western Samoa	1980-84		x				x		

Notes: Only the most recently available national Plan is included

* Withdrawn

** Not yet approved

TABLE 3(b):

Population policies in national development plans in recent ESCAP/ SPC small island countries

b) Policies related to migration

Country	Plan period	Rural development to reduce urbanization	Secondary urban or rural growth centres	Decentralization of urban activity	Educational system orientated towards rural living	Internal migration discouraged	Emigration discouraged
Cook Islands	1980						
Fiji	1981-85	x	x	x			
Guam	1980						
Kiribati	1979-82	x	x	x	x		x
Niue	1980-85						x
Papua New Guinea	1979-82						
Solomon Islands	1980-84*		x		x	x	
Tonga	1975-80	x					
Tuvalu	1980-83**				x		
Vanuatu	1981	x					
Western Samoa	1980-84	x	x	x			x

Note The categories above are very tentative and will be revised at a later date

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SOCIAL ASPECTS OF POPULATION CHANGE AND DEVELOPMENT IN THE SMALL ISLAND COUNTRIES OF THE ESCAP/SPC REGION*

by

Richard Bedford

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* This paper has been reproduced as submitted. The views expressed are those of the author and do not necessarily reflect those of the United Nations or the South Pacific Commission.

At one of the many conferences held during the 1970s on the theme of socio-economic development in small island countries, Dommen (1980, 179) captured several attributes of nations in the ESCAP/SPC region when he observed: 'Islands are in general fortunate places. Life is healthy and nature is bounteous though the menu may be short. Politics are friendlier. Hurricanes are usually more dangerous than social unrest.' When compared with countries in continental Africa, Asia and Latin America the islands under consideration in this Conference Seminar are indeed 'fortunate places'. Most people in the region can expect to live longer, are exposed to fewer endemic and epidemic diseases, have adequate housing and diets, suffer less from inequalities in living standards, and continue to enjoy the personal liberties associated with democratic political systems. The Prime Minister of Fiji, Ratu Sir Kamasese Mara, summed up well a situation which is still found in most countries in the Pacific when he wrote in his Preface to Fiji's Eighth Development Plan (1981-1985): 'The nation has a reputation for political and economic stability; a relatively low crime rate; a good civil rights record; little extreme poverty; a literate population and an increasing per capita Gross Domestic Product' (Central Planning Office, 1980, 1).

Some planners and politicians in countries like Fiji and Western Samoa might 'have much cause to be satisfied about the development of their country, particularly since independence' (Economic Development Department (Samoa), 1980, 1). However, there seems little doubt that a number of the smaller, less well endowed island groups are 'on the brink of a new period of instability' (Howlett, 1981, pers. comm.) For more than 20 years high rates of population growth (often in excess of 3 per

cent per annum) have persisted. Coupled with increasing demands for cash incomes and foreclosure of emigration as an outlet both for surplus population and temporary wage employment, population growth is imposing serious constraints on the achievement of planners' objectives and peoples' aspirations for a better standard of living. Indeed, as Howlett (1981) argues in her review of future prospects for small Pacific states, 'development', as presently conceived, will remain an unattainable goal for greater proportions of people within these countries, as well as for increasing numbers of island nations in the ESCAP/SPC region.

At the heart of the development debate in the Pacific is the vexing issue of increasing pressure of population on limited land and other resources. In 1965 an eminent demographer summed up the situation in the eastern Pacific as follows: 'these islands present populations, however idyllic they appear to be for the moment, nearer the brink of over-population in the Malthusian sense than almost any other groups of people'(Borrie, 1967, 22). The legacy of a protrated period of population growth is of critical importance for the futures of all small island states. In this background paper, where the theme is 'social aspects' of population change and development, the point of departure for the analysis is a dimension of this legacy -- the age-sex structures of island populations. Critical structural characteristics are the numbers and ratios of youths (under 15 years of age) and elderly (60 years and over) in the contemporary and projected future populations. The youthful component has relevance for provision of education and employment

opportunities as well as being a determinant, in the longer term, of future population growth. The numerical and proportional increase in the older population has implications for the provision of welfare services and facilities. Over the past twenty years in particular changes in work patterns, housing styles, family sizes and material aspirations have tended to disadvantage the elderly and the handicapped. Inspite of a claim often heard in the Pacific that the extended family system renders unnecessary institutional care for the old, the sick and the poor, planners are recognising a need to provide welfare support for an increasing number of dependents at the expense of the state.

Another important demographic attribute of many island countries in the ESCAP/SPC region is ethnic diversity. This has had a profound impact on the recent history of decolonisation in Melanesia and Micronesia, and continues to influence the character and content of social and economic planning in many countries. The relevance of multi-ethnic populations lies in the potential for conflict in situations where one group has come to pre-empt and dominate particular resources and spheres of activity (Howlett, 1981). Conflict between groups in recent years has found overt expression in Melanesia especially, and challenges to the power of dominant groups are being expressed more violently as pressure of population on resources intensifies. Aspects of this social dimension to population change and development in the ESCAP/SPC region are explored in the final section.

While the purpose of this paper is to provide a background to social aspects of population change at a regional level, the enormous diversity between island states, both interms of demographic prospects as well as critical social issues, has made it necessary in places to focus discussion on particular countries. Examples are drawn from six states which contain a representative range of important social and demographic problems in the region: Fiji (Melanesia), Solomons (Melanesia), Kiribati (Micronesia), Western Samoa (Polynesia), Cook Islands (Polynesia) and the Maldives (Indian Ocean). Statistics for New Zealand are also provided in some of the tables to permit comparison between the essentially agrarian societies under review and a highly urbanised small island society which has a population and land area similar to some in the ESCAP/SPC region.

THE DEPENDENCY ISSUE: A DESCRIPTIVE OVERVIEW

Throughout the region the ratio of 'dependents' (usually defined as persons under the age of 15 years together with those over the age of 60) to the 'economically active' population (aged 15 to 59 years) is high (Table 1). In most countries the ratio exceeds 80; in seven it is over 100. Only in two does it equal or fall below that found in New Zealand , where American military installations have attracted ux of immigrant personnel, and Tuvalu where the proportion en in the total population has been reduced by a of fertility decline and return migration of from Kiribati after decolonistion of the Gilbert lice Islands Colony. The composition of the dependency

TABLE 1: POPULATION STRUCTURE: A SUMMARY

Country	Year	% Population			Dependency ratios (per 100)		
		0-14	15-59	60+	Youthful	Aged	Total
Melanesia							
Fiji	1976	41.1	54.7	4.0	75.2	7.4	82.6
New Caledonia	1976	38.6	55.3	6.1	69.8	11.0	80.8
Papua New Guinea	1971	45.2	51.9	2.9	87.1	5.6	92.7
Solomons	1976	47.8	47.1	4.8	101.6	10.4	112.0
Vanuatu	1979	45.4	50.2	4.4	90.3	8.8	99.1
Micronesia							
Guam	1970	39.7	57.3	3.0	69.1	5.2	74.3
Kiribati	1978	41.1	53.1	5.8	77.3	10.9	88.2
Nauru	1977	44.2	53.0	2.9	83.3	5.4	88.7
TTPI	1973	46.2	47.6	5.9	97.3	12.4	109.7
Polynesia							
American Samoa	1974	44.5	50.7	4.4	88.5	8.1	96.6
Cook Islands	1976	49.8	44.2	6.0	112.6	13.6	126.2
French Polynesia	1977	42.0	53.1	4.9	79.1	9.1	88.2
Niue	1976	46.1	45.4	8.3	101.5	18.3	119.8
Tokelau Islands	1976	46.3	43.4	10.2	106.9	23.4	130.3
Tonga	1976	44.5	50.5	5.1	88.1	10.0	98.1
Tuvalu	1979	31.8	60.1	8.1	53.0	13.4	66.4
Wallis and Futuna	1976	46.6	47.5	5.9	98.1	12.5	110.6
Western Samoa	1976	48.2	47.3	4.5	102.0	9.6	111.6
Region							
Melanesia	c1976	44.4	52.1	3.4	85.1	6.5	91.6
Melanesia excl. PNG	c1976	42.6	52.9	4.5	80.5	8.5	89.0
Micronesia	c1976	43.0	52.1	4.9	82.5	9.4	91.9
Polynesia	c1976	45.1	50.0	4.9	90.2	9.8	100.0
Pacific	c1976	44.4	52.0	3.6	85.5	7.0	92.5
Pacific excl. PNG	c1976	43.3	52.0	4.7	83.2	9.0	92.2
Maldives	1974	44.9	51.3	3.8	87.6	7.4	95.0
New Zealand	1976	29.7	57.3	13.0	51.7	22.7	74.4

Sources: a) Pacific: Census volumes and the SPC Statistical Bulletin No. 15, Population 1978

b) Maldives: UN Demographic Yearbook, 1978.

c) New Zealand: Census volumes 1976.

ratio, in terms of the relative significance of youthful and aged components, varies markedly, but before looking at this more closely some clarification of the term 'dependent' is necessary in the context of the realities of life in most parts of the region.

Definitions

Youths under the age of 15 and people older than 60 years are termed dependents in many urban-industrial societies because children aged 5 to 15 usually are obliged to attend school and men and women either leave the workforce and/or qualify for social security benefits once they reach 60 years of age. Both groups are dependents in the sense that they are not producing the goods and services required for their continued survival. In the Pacific Islands and the Maldives this definition of dependency in terms of precise age groups is problematic. In the village economy children have a place in productive economic activities, especially subsistence gardening, from an early age, and for adults advancing age of itself brings no relief from gardening, fishing and cash earning activities such as production of handicrafts. Physical incapacitation rather than age per se is a more relevant determinant of socio-economic dependency in these situations.

While the conventional definition of dependents lacks relevance in terms of the present reality of life in the islands, it is useful as an indicator of some current and possible future social problems in the region. In virtually all the countries listed in Table 1 formal education of children has been encouraged for at least 30 years and is universally

accorded high priority in development plans. Growth in numbers of children under 15 years has important planning implications and, as Lucas and Waddell-Wood (1981) point out in their review of population policies contained in recent Pacific plans, several governments consider increases in the school age component a serious population problem.

As far as the aged dependents are concerned, few national populations in the region have life expectancies at birth in excess of 60 years and proportions living beyond this age are small (Table 1). However, with declining infant mortality (the major cause of the rather low life expectancies at birth in places where 'life is healthy and nature is bounteous') and improved medical care for the elderly this proportion must increase. State support for the aged is not common in the region at present but it is likely that expenditure on social welfare for this group will increase as life expectancies rise and the trend towards a nuclear family rather than extended family structure accelerates with urbanisation and monetization of the rural economy. The prevailing attitude among planners is that the family rather than the state should bear the cost of supporting the elderly -- as the architects of Fiji's latest development plan state: 'Government policy will be to promote family care of the elderly to the maximum extent, and to provide direct support only in cases of extraordinary need' (Central Planning Office, 1980, 77). However, with numbers aged 60 years and over projected to increase at a proportionately greater rate over the next 20 years than either the youthful or the economically active components, it is difficult to see the policy of minimum state support for the elderly being sustain

Growth in this component of the population thus has serious social policy implications for small island nations.

Youthful dependency

The most critical contemporary dimension of population structure in the Pacific Islands and the Maldives is the high proportion of people aged under 15 years. For the Pacific as a whole and the Maldives the proportion is very similar; just over 44 per cent of the total population is in this age group (Table 1). Expressed in terms of youthful dependency the ratio is around 86. This compares with a ratio of 52 in New Zealand. Within the Pacific there is some variation in the relative significance of this age group - the countries of Polynesia, in aggregate, have slightly higher proportions under 15 years (and thus higher youthful dependency ratios) than do those in Micronesia and Melanesia. This is due, in large measure, to the role international migration to New Zealand plays in depleting the adult populations of the Cook Islands, Niue, the Tokelau Islands and Western Samoa.

At the national level there is much greater variation. In Melanesia the more highly urbanised populations of New Caledonia and Fiji, with their substantial non-indigenous components, have lower youthful dependency ratios than other countries. In the case of New Caledonia the large population of European descent, with its long tradition of low birth rates, explains this situation. In Fiji, a substantial decline in fertility among the descendants of Indian immigrants, as well as some successes with a government-sponsored family planning programme in the Fijian population have progressively reduced the proportion of children

since the mid-1960s. The country with the highest youthful dependency ratio in Melanesia, the Solomons, also has the fastest rate of population increase (Table 2).

In Micronesia, Guam has the lowest proportion in the 0 to 14 age group. As noted earlier, movement of military personnel to service the large American base on the island has inflated the adult population thus depressing the measure of youthful dependency. In the case of Kiribati, which also has a lower youthful dependency ratio than the average for Micronesia, changes in birth rates together with emigration of Polynesians have contributed to the decline in rates of population growth in recent years. As in Melanesia, the island groups with the most rapid rates of population increase (the former Trust Territories of the Pacific Islands) have the highest dependency ratios (Table 1). In the small island nations of Polynesia, however, it is the effect of international migration on population growth that is causing the most significant changes in age structure and higher than average youthful dependency ratios (Tables 1 and 2). The unusual case of Tuvalu has already been explained -- adult migration back to this cluster of very small atolls and reef islands is responsible for the atypically high rate of population increase (over 4 per cent per annum) for a Polynesian country in recent years.

Aged dependency

At the other end of the population pyramid there is broad comparability between proportions aged 60 years and over and the aged dependency ratios in the Pacific and the Maldives (Table 1). In both areas the proportions and ratios are only

TABLE 2: POPULATION GROWTH AND DISTRIBUTION: A SUMMARY

Country	Year	Population		Average annual growth rate (%)[a]		
		No.	% rural	Total	Rural	Urban
Melanesia						
Fiji	1976	588,068	62.9	2.1	1.5	3.2
New Caledonia	1976	133,233	39.3[d]	5.6	2.6[d]	8.0[d]
Papua New Guinea	1980	3,100,000[b]	88.9[d]	2.6[d]	1.5[d]	16.5[d]
Solomons	1976	196,823	90.7	3.4	3.3	4.9
Vanuatu	1979	110,028	81.8	3.2	3.0	8.0
Micronesia						
Guam	1980	105,816[c]	9.0[e]	2.4	?	?
Kiribati	1978	56,213	64.0	1.7	0.8	4.0
Nauru	1977	7,254	0.0	1.8	N.A.	1.8
TTPI	1973	115,251	53.6	3.6	1.1	7.2
Polynesia						
American Samoa	1974	29,190	57.4	1.6	1.1	2.3
Cook Islands	1976	18,127	73.2	-3.2	-1.7	-7.0
French Polynesia	1977	137,382	41.3	2.3	1.3	3.0
Niue	1979	3,578	78.6	-2.9	-1.1	-8.6
Tokelau Islands	1976	1,575	100.0	-0.3	-0.3	N.A.
Tonga	1976	90,085	73.5	1.5	0.9	15.4
Tuvalu	1979	7,349	70.2	4.2	-2.4	?
Wallis & Futuna	1976	9,192	100.0	1.0	1.0	N.A.
Western Samoa	1976	151,983	78.9	0.7	0.6	1.2
Region						
Melanesia	c1976	3,830,000	83.0	2.4	2.0	6.7
Melanesia excl. PNG	c1976	1,030,000	67.0	2.3	1.8	3.5
Micronesia	c1976	300,000	40.0	2.0	0.9	3.0
Polynesia	c1976	440,000	65.0	1.4	0.7	2.3
Pacific	c1976	4,570,000	78.0	2.3	1.8	5.1
Pacific excl. PNG	c1976	1,770,000	63.0	2.1	1.3	2.9
Maldives	1974	128,697	88.7[f]	3.1	?	?
New Zealand	1976	3,129,383	17.0	1.8	0.07	2.0

a. Exponential rate of change between two recent censuses or population estimates
b. Census estimate
c. Preliminary censuses count
d. 1971 figures
e. 1970 figures
f. 1967 figures

Sources: a) Pacific: Census volumes and the SPC Statistical Bulletin, No. 15, Population 1978.
b) Maldives: UN Demographic Yearbook, 1978.
c) New Zealand: New Zealand Official Yearbook, 1980.

a third of those found in New Zealand. The only island country in the ESCAP/SPC region that comes close to New Zealand's proportion of elderly is its dependency, the Tokelau Islands. In this population of 1500 people the aged dependency ratio actually exceeds that in New Zealand. The adult population contributing to the support of their aged kin in the islands have exercised their right, as New Zealand citizens, to seek work and settle overseas.

There is more obvious variation between parts of the Pacific and individual countries in the proportions of elderly in the total populations and in the aged dependency ratios. International migration, in particular, has affected these figures for several Polynesian countries, while in others, effective public health campaigns and the generally hospitable environment have contributed towards longevity. In the case of Papua New Guinea, which has one of the lowest aged dependency ratios, inadequate census data coupled with a somewhat lower life expectancy for the population as a whole are partial explanations. Nauru and Guam, the other countries with markedly lower proportions under 60 years, owe their low aged dependency ratios to the effects of labour migration to the phosphate mines and military base on the respective population structures.

Rural-urban disparities

Before examining some of the implications of these proportions and ratios for social planning it is worth mentioning an important intra-national variation in population structures. Although the great majority (over 75 per cent) of people in the Pacific and the Maldives live in rural areas a common trend

throughout the region is migration to urban areas (Table 2). The tendency is for urban populations to increase more rapidly than their rural counterparts except in the Cook Islands and Niue where migraton out to New Zealand is taking a heavier toll from the 'towns' of Avarua and Alofi than the villages. Although internal migration is not to be addressed directly at this Conference Seminar, it is important to note some of the broader structural implications of this process for the populations of rural and urban areas. Using examples from five countries in the Pacific it can be shown that youthful and aged dependency ratios are much lower in the towns than the rural communities (Table 3). The isolated rural peripheries, such as the northern Cook Islands and the Lau group in Fiji, tend to have higher dependency ratios than their respective rural averages reflecting further significant differences in age structure within national populations.

These differences between areas have important implications for social development, especially if planners are going to continue to argue that the family must bear the full cost of maintaining the dependents. In the northern Cook Islands, for example, there are 143 children and 25 elderly men and women per 100 in the most productive and economically active age group. The burden of dependency on the latter adults is a much higher one in aggregate terms than is sustained by urban dwellers. In some communities the extended family system has been so fragmented spatially by migration to towns locally and overseas that it no longer serves to support all its rural dependents. Lonely, uncared for old people and undernourished, poorly clothed and housed children are not uncommon sights in parts of the rural Pacific.

TABLE 3: POPULATION STRUCTURE: SELECTED AREAS

Country/area & census year	Population	% Population			Dependency ratios (per 100)		
		0-14	15-59	60+	Youthful	Aged	Total
Fiji (1976)							
Urban areas	218495	37.8	58.8	3.4	64.6	5.9	70.5
Rural areas	369573	43.1	52.5	4.4	82.1	8.4	90.5
Solomons (1976)							
Honiara	14942	38.3	59.9	1.8	55.4	2.9	58.3
Other areas	181881	48.6	46.3	5.1	105.6	11.1	116.7
Kiribati (1978)							
South Tarawa	17921	37.7	58.0	4.3	65.0	7.4	72.4
Other areas	38292	42.6	50.8	6.6	83.9	12.9	96.8
Western Samoa (1976)							
Apia	32099	41.6	57.3	1.1	77.2	8.6	85.8
Other areas	119884	50.0	45.5	4.5	109.8	10.0	119.8
Cook Islands (1976)							
Rarotonga	9802	45.6	49.5	4.9	91.8	9.8	101.6
Other Islands	8325	54.8	37.4	7.4	144.6	19.5	164.1
Island peripheries (1976)							
Northern Cooks	2044	53.3	37.3	9.4	143.0	25.2	168.2
Lau Islands (Fiji)	14452	47.5	46.7	5.8	101.5	12.3	113.8
Maldives (1967)							
Urban areas	11760	45.0	51.7	3.3	87.1	6.3	93.4
Rural areas	92041	44.3	52.0	3.6	85.1	7.0	92.1

Sources: Census reports, UN Demographic Yearbook 1978, SPC Statistical Bulletin No. 15.

On the basis of available census data for the Maldives in 1967 it would seem there was little difference in the youthful and aged dependency ratios in rural and urban areas (Table 3). The situation is likely to have changed considerably since the country became a Republic in 1968. There has been substantial investment in the development of the capital, Male', which has ensured that its residents enjoy a standard of living that is substantially higher than in the atolls (Colombo Plan Bureau, 1980, 74). According to one recent report on development in this country, unemployment in the capital is a serious problem. Results obtained in a census in 1977 apparently suggest that over 15 per cent of the labour force in Male' were without work compared with 3.7 per cent in the villages. The majority (54 per cent) of the urban unemployed were aged between 15 and 24 years (Colombo Plan Bureau, 1980, 74). These figures suggest there has been an increase in migration to Male', especially among the younger adults, and that disparities in dependency ratios between rural and urban areas will have increased. Unfortunately the 1977 census data on age-sex structure are not available to assess the contemporary situation.

Towards 2000

At the risk of over-simplifying a complex and diverse pattern of population growth trends within the island realms of ESCAP and SPC, it is appropriate to conclude this section with a brief assessment of possibilities for structural change by the year 2000. The contemporary age-sex structure of the Pacific islands population as a whole will generate considerable growth in numbers over the next 20 years. On the basis of 'medium variant' projections prepared by the United Nations (1980) it

has been established that the regional total could reach 7.8 million by the end of this century; 76 per cent more people than were estimated to be in the Pacific in 1975 (Table 4). Almost two thirds of the Islanders will be living in Papua New Guinea (compared with 61 per cent around 1975), and the average annual rate of population growth could still be close to 2 per cent. If the UN projections prove to be realistic then the population of the Pacific will retain its essentially 'youthful' character with at least 35 per cent of the total being under 15 years of age (Figure 1; Table 5). The number of youths will increase from around 1.9 million in 1975 to just under 3 million in 2000 - a substantial growth in a population to be educated and employed in a region where the questions 'education for what?' and 'employment where?' are currently taxing the planners.

While the proportion of people over 60 years in the region's population is unlikely to rise above 7 per cent by the end of the century, and aged dependency ratios will still be at levels below half that found in New Zealand in 1976, the numerical increase in elderly people will be the most spectacular of any age group (Table 5). Compared with a 55 per cent rise in numbers aged 0 to 14, the 60 and over group could more than double -- from around 225,000 in 1975 to some 475,000 by 2000 (Table 5). The only area where growth is unlikely to reach 100 per cent is Polynesia. Continued emigration to New Zealand and the United States will draw off many of those people who, if they were from Micronesia or Melanesia, could expect to die in their countries of birth.

By the year 2000 there could be almost as many elderly people living in the Pacific Islands as there may be in New Zealand.

TABLE 4: POPULATION ESTIMATES 1975/78-2000/03

Region/ Country	Population (000's) 1975/78	2000/03	% increase 25 yrs	Average annual rate of growth 1975/78-1980/83	1995/98-2000/03
Region[a]					
Melanesia	3702	6600	78.3	2.4	2.0
Melanesia excl. PNG	986	1614	63.7	2.2	1.4
Micronesia	307	575	87.3	2.8	2.1
Polynesia	435	656	50.8	1.9	1.2
Pacific	4444	7831	76.2	2.3	1.9
Pacific excl. PNG	1728	2845	64.6	2.3	1.6
Country					
Fiji[b]	551	874	58.6	2.1	1.5
Solomons[c]	197	458	132.5	3.4	3.5
Kiribati[d]	58	93	60.3	2.1	1.4
Western Samoa[e]	152	244	60.5	2.1	1.4

a. 'Medium' variant projections for the regions as defined in this paper (i.e. Melanesia includes Fiji). Adapted from UN (1980).

b. Fijian and Indian populations only; medium projections. From Zwart (1979).

c. Melanesian population only; medium projection (no. 3). From Macrae et al. (1981).

d. Indigenous de jure population; medium projection (no. 3). From Macrae et al. (1982).

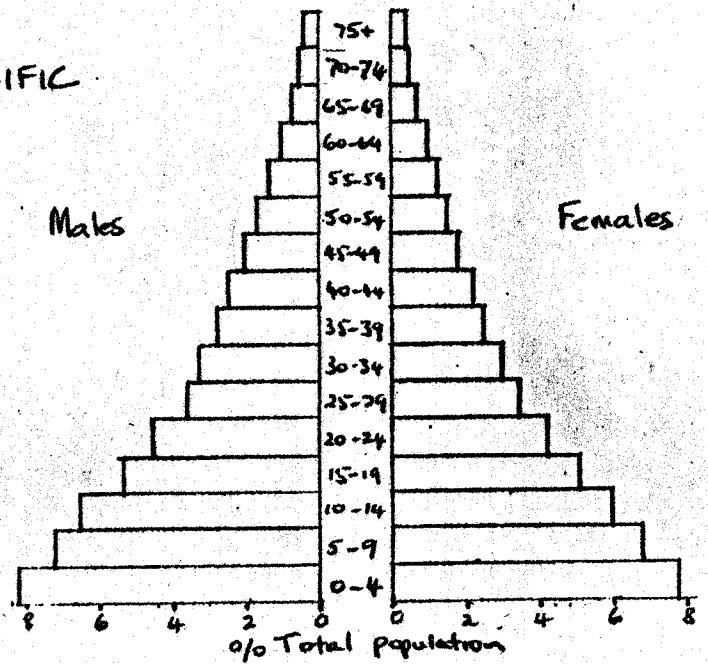
e. Indigenous population; medium projection (no. 7). From Department of Statistics (1979).

FIGURE 1

AGE-SEX STRUCTURE

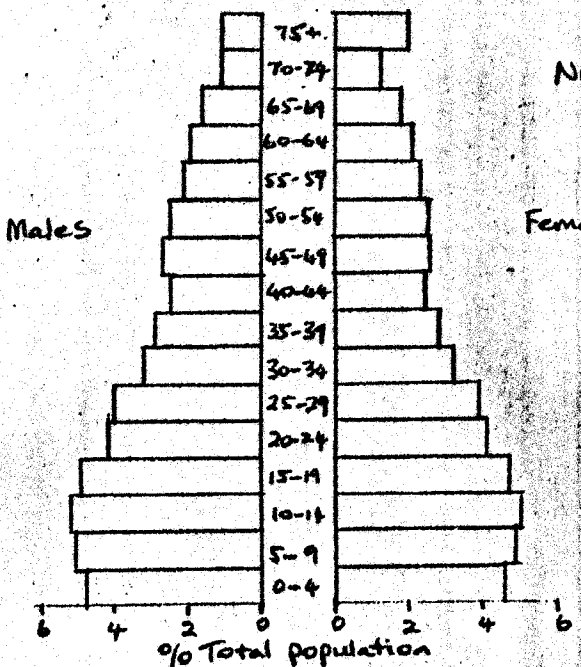
1975

PACIFIC



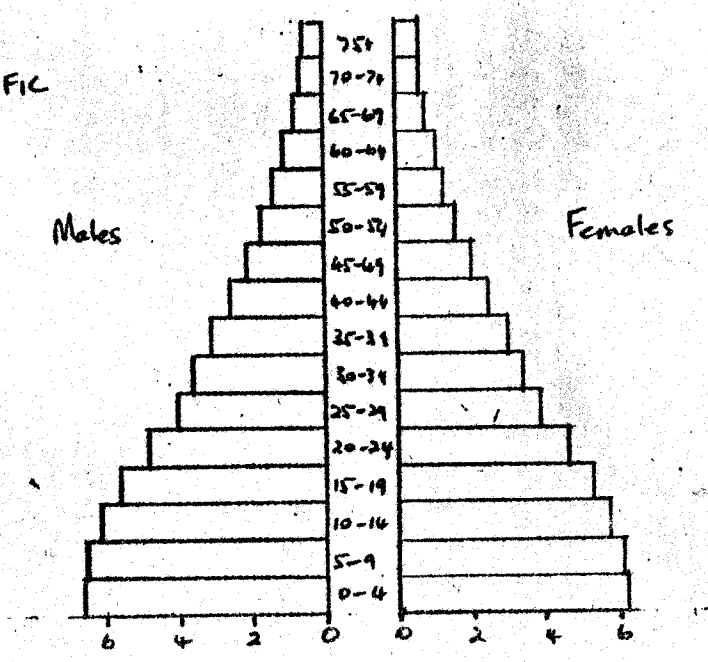
1976

NEW ZEALAND



2000

PACIFIC



2001

NEW ZEALAND

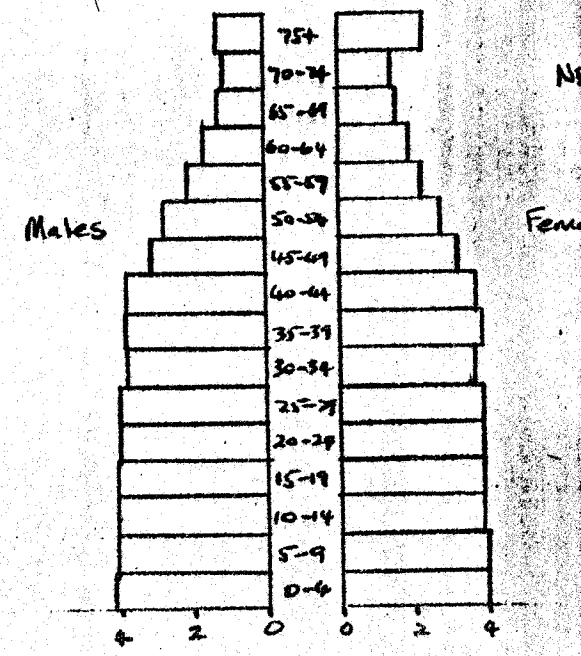


TABLE 5: POPULATION STRUCTURE 2000

Region/ Country	% increase c.1975 – c.2000 in population aged			Population 60+ 2000		Dependency ratios (per 100) 2000		
	0-14	15-59	60+	Number (000's)	% total	Youthful	Aged	Total
Region[a]								
Melanesia	58.4	90.7	114.0	398	6.0	66.0	10.7	76.7
Melanesia excl. PNG	31.3	82.4	143.2	107	6.6	56.8	11.1	67.9
Micronesia	60.2	106.2	111.8	36	6.3	61.4	10.8	72.2
Polynesia	22.8	74.9	77.3	39	5.9	67.2	10.6	77.8
Pacific	54.8	90.2	110.7	474	6.1	65.8	10.7	76.5
Pacific excl. PNG	34.1	100.8	120.5	183	6.4	60.1	11.0	71.1
Country								
Fiji[b]	17.3	81.8	174.5	59	6.8	49.2	10.8	60.0
Solomons[c]	118.7	147.2	124.7	17	3.7	89.9	7.3	97.2
Kiribati[d]	33.4	80.2	66.2	6	6.2	54.5	10.2	64.7
W. Samoa[e]	52.9	65.7	91.1	13	5.4	94.1	11.1	105.2

a-e as for table

A critical social issue confronting planners in New Zealand is how to sustain this non-productive population at a reasonable standard of living. While the economically active base in the Pacific will be considerably larger than that in New Zealand (around 4.4 million compared with an estimated 2.3 million), and the burden of aged dependency in the population will thus be lower, planning for the welfare of elderly people in the islands will be accorded higher priority in 2000 than at present. Already planners in Fiji have found it necessary, for humanitarian reasons, to set aside state resources to deal with basic needs deficiences in food, shelter, health care, water sanitation and education for the destitutes, the elderly, the severely handicapped and unemployed unskilled youth (Central Planning Office, 1980, 26). While the same planners claim this is 'a short-term form of Government intervention to help those in direct need' and is 'not the first stage towards the establishment of a welfare state' (Central Planning Office, 1980, 27), there seems little doubt in my mind that increased support by the state for dependent groups in the population is inevitable given the likely paths of population growth and socio-economic change over the next 20 years.

SOCIAL IMPLICATIONS OF HIGH DEPENDENCY RATIOS

High dependency ratios have important implications for virtually all areas of social policy and planning. In this section attention is focussed on public health, education and housing. The implications of the broad base to the population pyramid for growth in the labour force and demands for urban-based employment in particular are not discussed here. Professor Howlett takes

up the employment issue in her background paper in the context of economic aspects of population change and development.

Healthy populations?

Crude indicators of the physical well-being of populations in the ESCAP/SPC region support Dommen's contention that 'life if healthy' in most of the islands. Infant mortality rates are low by third world standards, and the number of deaths per 1000 population tends to be below that found in New Zealand (Table 6). Youthful age structures are an important factor contributing to these low crude death rates but, except for parts of Melanesia and the Maldives, there seems little doubt that hospitable environments and effective public health campaigns and infrastructures have contributed to the generation of healthy populations. Ratios of people to hospital beds and physicians indicate that medical services are highly developed although there seem to be some anomalies in the hospital bed ratio especially for parts of Melanesia (Table 6). It must be noted that data deficiences, especially with regard to infant death registration are common throughout the region. Estimates of life expectancy at birth from information collected in censuses tend to be lower than those derived from official death registration records (see, for example, Zwart, 1979). There is still substantial room for improvement in conditions which affect the health of children and the older population in particular.

A critical factor affecting child health is diet. Throughout the region there has been a shift away from indigenous sources of vitamins, protein and starch towards much less nutritous imported

TABLE 6: INDICATORS OF HEALTH: A SUMMARY

Country	Mortality rates 1978 (°/oo)[a]		Population per hospital bed[b]		Population per physician[b]	
	CDR	IMR	Year	No.	Year	No.
Melanesia						
Fiji	7	41	1974	350	1978	2079
New Caledonia	8	35	1976	76	1976	1300
Papua New Guinea	?	?	1972	169	1975	13800
Solomons	13	52	1971	120	1977	6666
Vanuatu	20	?	1975	102	1969	3200
Micronesia						
Guam	5	18	1976	450	1976	900
Kiribati	7	49	1976	175	1976	3500
Nauru	5	19	1971	34	1971	700
TTPI	4	31	1976	240	1976	2000
Polynesia						
American Samoa	4	19	1976	150	1976	1000
Cook Islands	6	33	1974	112	1972	909
French Polynesia	7	38	1976	144	1975	1625
Niue	6	32	1976	133	1976	1000
Tokelau Islands	5	41	-	?	-	?
Tonga	2	21	1976	300	1976	3000
Tuvalu	?	?	-	?	-	?
Wallis & Futuna	11	54	1972	33	1974	3333
Western Samoa	7	40	1977	214	1977	2884
Maldives	23	?	1977	3500	1977	15555
New Zealand	8	14	1977	97	1976	772

a. From Caldwell et al. (1980)

b. From UN Statistical Yearbook, 1978

substitutes. As Ward and Hau'ofa (1980, 40) point out, Pacific peoples generally had a nutritionally adequate diet in pre-contact times, even on those islands with very restrictive environments. Inadequate diet among the very young children arose not so much from a lack of nutritive foods as from poor feeding practices and the inability of children to take in sufficient quantities of the sorts of food the rest of the population subsisted on. While some of the imported foods have the potential for providing a more balanced diet for young children, the tendency for refined wheat and flour, polished rice, sugar and canned meat and fish to replace rather than supplement local foods is a cause of increasing concern to health officials. Evidence from several studies in the region suggests that malnutrition is (or is becoming) an important factor in infant and child mortality and low learning capacity of children (Ward and Hau'ofa, 1980, 42-46).

Another health problem generated by accelerating socio-economic change in island states is the rising prevalence of chronic non-infectious degenerative diseases such as diabetes mellitus, hypertension, obesity and heart complaints. These are particularly prevalent in Polynesian and Micronesian populations which have suffered more radical changes in diets and life styles than most Melanesians. In addition to diet, other factors which are thought to be relevant to this new wave of disease include stress due to changes in social, moral and ethical values, new work patterns in a cash economy, and reduced physical activity (Howlett, 1981). An explosion of chronic degenerative disease, especially in Polynesia and Micronesia is one dimension of the new period of instability in the small islands which Howlett (1981) predicts for the late twentieth century. Another is a major increase in mental illnesses.

Findings in a recent survey for the South Pacific Commission suggest that the mental health situation is, like the physical disease pattern, in a 'lull before the storm' (Howlett 1981). The incidence of mental illness is highest in those populations with a considerable degree of involvement in the cash economy, western styles of government and education, and the more materialist and achievement-oriented nuclear family system. Thus, as Howlett (1981) observes, the problem of mental disorder is greater among American Samoans than Western Samoans; greater among the I-Kiribati who work abroad than the Solomon Islanders who do not; greater among Indo-Fijians than Fijians; greater among Cook Island immigrants to New Zealand than among Samoan or Tongan immigrants; greater among members of the elite than the masses.

The high level of youthful dependency is contributing towards health problems associated with dietary change, stress-related degenerative diseases and mental disorder. It is now more expensive to feed, clothe, house and raise children, especially in town, and competition within families for inadequate cash incomes (and, in some territories, scarce subsistence resources) is generating pressures which often disadvantage the very young and the elderly. On a larger scale, continued rapid population growth is threatening the viability of the mixed subsistence-cash crop economy on many islands; there is insufficient land in Kiribati and Tuvalu, for example, to provide an adequate livelihood for another 40,000 people which is in the range projected for 2000. Already water pollution resulting from excessive population densities and changed sanitary habits has led to cholera outbreaks in the late 1970s in Kiribati and the Maldives. Although death rates throughout

the region are presently static or declining, it is possible that population pressure and related physical and mental disorders may cause an increase in mortality in the longer term in parts of the ESCAP/SPC region.

The education dilemma

Compounding the problems and tensions which are creating a new breed of medical concerns in the region is the question of education. The following comment by Vusoniwailala (1978, 11) sums up well the essence of the current situation:

> And so we went to class rooms, grew up to put on ties and sweat in jackets, to pull white sox over our black skins. We looked around and took stock. We could tell those with a long way to go for they walked barefoot. ... We leave the old and infirm in the villages and rush to the towns. Some are employed; how lucky they are. Many more keep searching, looking for jobs they may never find. ... Their diploma of achievement is spelt in capital letters - FRUSTRATION.

This frustration is being fostered by a deepening conflict between individual goals and national needs. After several generations of primary and (for a minority) secondary education systems using curricula developed for urban-industrial societies, most young people and their parents want schooling that will provide them with a qualification for salaried employment in town. Planners and politicians, on the other hand, see a more urgent priority now is to prepare young people for participation in a rural life given the agricultural basis of island economies and severely limited urban employment opportunities in many of the smaller countries.

Throughout the ESCAP/SPC region formal education systems

are well-entrenched and high proportions of children (over 90 per cent in most countries) attend at least the primary schools (Table 7). Pupil-teacher ratios tend to be reasonably low in these schools, and in most countries there are as many girls as boys attending the primary classes. High proportions of adults are literate in their indigenous languages (over 90 per cent in most Micronesian and Polynesian countries) and knowledge of at least one European language, most commonly English, is widespread. There are marked disparities in both the content and quality of education within and between countries in the region, but perceptions of the material rewards and status that can result from academic qualifications are very widespread. While planners readily acknowledge the restricted opportunities for salaried employment in most of the island countries children, with the encouragement of their parents and teachers, continue to prefer academic qualifications for work in town (Howlett, 1981).

Given the difficulty of changing social attitudes and the rapidly increasing material aspirations in any population, the demand for an academic education, and the subsequent search for salaried employment will continue. The result will be a deepening sense of frustration among thousands of school leavers who, as a result of the youthful age structure of island populations, must enter the workforce over the next 20 years. The current urban unemployment (or underemployment) crisis in places like Male' Apia, Nuku'alofa, Funafuti, and Tarawa must become more severe, at least in the medium term. And, even if a greater acceptance of a rural livelihood eventually does emerge among young islanders, population increase in these countries will make a satisfactory standard of living in the villages more and more difficult to

ABLE 7: EDUCATION STATISTICS: A SUMMARY

Country	Proportion of children attending school[a]			Proportion of people 15 yrs+ literate[a]		Primary education[b]		
	Year	6-12 yrs	13-16 yrs	17-19 yrs	Year	%	Year	Pupil/ Teacher Ratio	% pupils Female
Melanesia									
Fiji	1976	93.4	70.0	23.2	1976	85	1977	31	49
New Caledonia	1969	100.0	84.5	12.0	1976	>90	1977	21	49
Papua New Guinea	1971	35.7	31.6	6.2	1971	32	1978	30	40
Solomons	1976	46.8	46.8	18.4	1976	49	1975	26	38
Vanuatu	1967	67.4	64.2	23.7	1967	<50	1976	25	45
Micronesia									
Guam	1970	88.4	91.2	44.6	1970	>90	1975	22	48
Kiribati	1978	92.4	67.6	11.5	1978	94	1978	31	49
Nauru		?	?	?	1976	>90	1974	17	47
TTPI	1973	90.1	86.3	52.1	1973	>90	1976	21	48
Polynesia									
American Samoa	1974	87.5	89.5	47.8	1974	95	1976	19	?
Cook Islands	1976	96.4	80.6	15.2	1976	>90	1973	20	50
French Polynesia		?	?	?	1976	>90	1976	22	48
Niue	1976	97.5	71.5	4.5	1976	>90	1976	17	45
Tokelau		?	?	?	1976	>90		?	?
Tonga	1976	96.2	85.5	51.0	1976	92	1976	28	48
Tuvalu	1979	97.4	46.5	6.7	1979	97		?	?
Wallis & Futuna		?	?	?	1976	34		?	?
Western Samoa	1976	82.0	94.5	53.9	1976	>90	1977	25	48
Maldives		?	?	?	?	?	1977	46	45
New Zealand	1976	>95	>95	>45	1976	>90	1976	23	49

a. South Pacific Commission Statistical Bulletin No. 15, unpublished data, SPC.

b. Unesco Statistical Yearbook, 1978-79

attain. Education for rural development is unlikely to solve many problems if the resources (especially land) are not available in the countryside to provide Pacific peoples with 'the good things in life ... often seen in terms of Western standards of material wealth' (Kavaliku, 1980, 64).

Housing: questions of quality and quantity

As in the urban-industrial west, one of the most conspicuous indicators of individual well-being in the islands is becoming housing quality. The demand for houses constructed from imported permanent materials has increased dramatically over the past twenty years, especially in Polynesia. In part, attempts by governments (both colonial and post-colonial) to improve living conditions in rural communities and towns have promoted the boom in permanent materials housing. Equally important has been the impact of education and urban employment within and outside the region on aspirations for accommodation. Indeed, one of the most prevalent reasons given by Tongans and Western Samoans for seeking employment in New Zealand is the desire to earn money to build a permanent materials house in the village. Within the islands the educated urban elite often have the largest and most prestigous dwellings in their villages -- a conspicous reminder of their rural heritage and often-stated intention to return at some stage in the future.

The trend towards more permanent housing is accelerating the demands for electrification of villages, provision of better water supply and sanitation facilities and more adequate rural service and transport infrastructures. With substantial proportions of the population still village resident in most

island states, the costs of rural development to meet rising aspirations for a better standard of living are very considerable. The high proportion of children in village populations will ensure continued (and in some countries, rising) demand for resources for rural investment, especially if planners are to live up to a pledge contained in most contemporary development plans that disparities will be reduced between living conditions and opportunities in town and country.

In the towns the housing boom is compounded by the drift from rural communities of young people seeking education and employment, families without adequate productive resources in the village seeking a livelihood, and a trickle of destitutes and elderly who cannot satisfy their basic needs seeking institutional support. All towns in the region have a 'housing problem'; in most the critical issue is how to provide accommodation at a cost which people with very low cash incomes can afford to rent or purchase. There have been several experiments with low-cost housing schemes over the past twenty years but except for those countries with an outlet for migrants to cities in New Zealand or North America, no island state has been able to cope with the demand for urban housing. Many migrants have had to erect shelters wherever they can get access to land. The crowded, often insanitary residential conditions have contributed to the emergence of another social problem -- juvenile delinquency. Unemployed, often poorly educated youths seek to secure a livelihood through crime and some illusions of the unrealised pleasures of urban residence in alcohol and drugs. In all countries in the ESCAP/SPC region the number of young people who have rejected the world of their rural forebears and, in turn, been rejected by the world

of administration and commerce in the city is increasing. A new dimension in being added to the social disorder accompanying rapid economic change at a time of high levels of youthful dependency in small populations.

ETHNIC PLURALISM: PROBLEMS OF INEQUALITY AND INSTABILITY

Unlike the condition of youthful dependency which is universal in the ESCAP/SPC region, ethnic plurality is an issue of concern to planners and politicians in only some of the small island states. In several countries one ethnic group is overwhelmingly predominant -- in Kiribati and the Cook Islands, for example, at least 90 per cent of the contemporary populations have a common language, closely related social structures and similar skin colour (Table 8). In the Maldives virtually all the inhabitants are Muslims, speak Dihevi, and are descended from Sinhalese people of Aryan stock.

In some countries in the Pacific contemporary populations are quite diverse in terms of ethnic background. Two types of ethnic plurality can be identified, both of which co-exist in certain states. The first is where substantial minorities (or, in a few places, majorities) of people are descended from immigrants who came into the region during the period of colonial rule. The most conspicuous examples are Fiji where Indians (or Indo-Fijians) comprise 50 per cent of the population (Table 8), and New Caledonia where Europeans (38 per cent) and people of Indonesian, Vietnamese and Polynesian descent (20 per cent) outnumber the indigenous Melanesians. In other countries such as French Polynesia, Guam, and the Solomon Islands there are important Asian and European

TABLE 8: ETHNIC GROUPS: SELECTED COUNTRIES

Country and Ethnic Group	Year	Population	% Total
Fiji	1976	588,068	
Melanesian		259,932	44.2
Indian		292,896	49.8
Rotuman		7,291	1.2
European		4,929	0.8
Part-European		10,276	1.8
Chinese & Part Chinese		4,652	0.8
Other Pacific Islanders		6,822	1.2
Others		1,270	0.2
Solomons	1976	196,823	
Melanesian		183,665	93.3
Polynesian		7,821	4.0
Micronesian		2,753	1.4
European		1,359	0.7
Chinese		452	0.2
Others		461	0.2
Mixed race		312	0.2
Kiribati	1978	56,213	
Micronesian		50,249	89.4
Part-Micronesian		4,769	8.5
Polynesian		774	1.4
European		338	0.6
Asian		33	0.1
Others		50	0.1
Cook Islands	1976	18,127	
Maori		16,596	91.6
Part-Maori		726	4.0
European		632	3.5
Others		173	0.9

Sources: Census reports

The other type of ethnic plurality is largely confined to Melanesia and takes the form of a diversity in languages, customs and skin colours among descendants of the indigenous populations which inhabited the islands before colonial intrusion. The most extreme example is Papua New Guinea where more than 700 indigenous languages are spoken by peoples that have quite different customs and traditions. The Melanesian population in the Solomon Islands, which comprises over 90 per cent of the total (Table 8), has a diverse cultural heritage and intra-Melanesian conflicts here, as in Papua New Guinea and Vanuatu threaten the political and social stability of the new states. In this section of the paper some of the important contemporary social issues which owe their origin to these two types of ethnic pluralism are introduced briefly. In complex combination with the problem of increasing pressure of population on scarce resources in small countries, ethnic diversity has created a potentially explosive situation with far reaching social and political dimensions.

Ethnic inequality

Throughout the Pacific differences between groups in terms of levels of living, opportunities for economic advancement, and social status and privilege are widening. In Polynesia and Micronesia these disparities pre-date colonial intrusion -- they are a function of indigenous social systems which were (and in places remain) organised on an hierarchical basis. Over the past century people with other cultural heritages settled in the islands. In general the people of European origin assumed privileged political and economic positions while the Asian labourers and entrepreneurs became dependent on the market economy because of restricted opportunities to acquire land.

The history of this evolving pluralism is founded on inequalities between groups and in some countries, such as Fiji and French Polynesia, the differences between ethnic groups are of much greater social and economic significance than indigenous hierarchies of privilege and status. The basis of this ethnic inequality in Fiji is well known: while descendants of the indigenous (Fijian) population who comprise 44 per cent of the population have rights to 80 per cent of the land, the Indian majority owns less than 10 per cent. In New Caledonia the European minority control the market economy and have per cepita incomes and material living standards which are far higher than those enjoyed by Melanesians. In Guam descendants of the indigenous peoples are relatively powerless in an economy dominated by American military interests and sizeable European and Asian components.

While disparities between groups in some countries are well known and have the potential for generating serious inter-ethnic conflict in the future, the position of small minorities in other states is less clear. Talk of repatriating descendants of Asian and non-indigenous Pacific populations during the transition to independence led to considerable insecurity among groups in some countries. In the Solomon Islands, for example, the small Micronesian (I-Kiribati) and Chinese communities attracted attention by disaffected Melanesians who believed the rights and privileges of 'aliens' ceased with the departure of colonial rule. In the central Pacific Polynesians in the multi-ethnic Gilbert and Ellice Islands Colony elected to go it alone rather than become a fairly small minority in an independent state dominated by Micronesians.

Differential growth rates and age structures of the major ethnic groups in some countries are contributing to inequalities. In Fiji the Indian component has been increasing at a faster rate than the Fijian since the 1920s and one legacy of several decades of higher birth rates is a rapidly expanding Indian labour force. With access to land restricted by legislation which protects the interests of Fijians in rural areas, and a much slower rate of expansion in the urban job market than the workforce, economic prospects are bleak for increasing numbers of young Indians. Partly in response to this situation Indian emigration has intensified. However, opportunities to leave the country have diminished in recent years as unemployment rose in the countries of destination.

The desire among Indians to leave Fiji was fuelled by a motion put to the Fiji House of Representatives in 1975 to the effect 'That this House agrees that the time has arrived when Indians or people of Indian origin in this country be repatriated back to India..' Although the motion was condemned by the House, the motto 'Fiji for Fijians', which became a platform for the Fiji Nationalist Party, struck a sympathetic chord among the Fijian people and it may well revolutionise Fiji's politics (Premdas, 1980, 43). In New Caledonia more overt conflict between the radical Kanak Liberation Party and entrenched French economic and political interests has intensified since 1975 as Melanesians seek to reduce disparities in levels of living and opportunity between ethnic groups. Stimulating this conflict is differential rates of population growth among the major groups -- the Melanesian component is growing faster than the European one.

Political instability

While the potential for conflict between groups with different cultural heritages has been high in recent years in parts of the region, more frequent outbursts of violence have been generated by disputes between groups of Melanesians. 'Inter-tribal' warfare in the Central Highlands of Papua New Guinea has a lengthy heritage although increasing population pressure is undoubtedly a factor underlying contemporary instability in this area. In Vanuatu differences between groups of Melanesians contributed to the only 'violent' transition to independence to date in the Pacific. The social and political fabric of the Solomon Islands is threatened by a widening demographic imbalance between the Malaitans and several smaller ethnic groups with quite different customs who fear political and economic domination by the majority. Such fears were a factor behind several secessionist movements in Melanesia during the 1970s: in Bougainville, Papua, and parts of the Highlands in Papua New Guinea; in New Georgia in the Solomons; in Espiritu Santo in Vanuatu.

The potential for political instability in Melanesia is complicated by the differential socio-economic impact which colonialism has had on indigenous societies. In Papua New Guinea some groups were integrated much more fully into the capitalist economy and colonial administration system than others. The Papuans and Tolais, for example, were in much stronger economic and political positions than the Wabags and Bukas when the country obtained independence in 1975. In the Solomon Islands people from Guadalcanal, the Shortland Islands and New Georgia had much greater political influence in the colonial administration than the Malaitans and Choisel Islanders. The Aobans, Fila Islanders and

Tongoans in Vanuatu were much more prominent in the pro-independence political parties than inhabitants of some of the larger islands. Fears of political and economic advantage accruing to those areas which were penetrated more completely by the agents of colonialism and subsequently played a major role in the transition to independence whose populations will be a source of instability for some time in many parts of Melanesia.

A concluding comment

Ethnic diversity and youthful structures of populations will test the ingenuity of planners and politicians throughout the ESCAP/SPC region. The 'rather dismal picture' which Borrie (1967, 25) painted for the future of small island populations in the eastern Pacific in 1965 has not improved much inspite of some optimistic assessments by planners in recent years. In my view, the authors of a statement prepared as Tonga's contribution to a conference in Honolulu on 'Development the Pacific Way' in 1980 summed up the present situation well when they wrote:

> Our people are generally well-fed but we are poor in Western goods that are increasingly becoming essential to our new way of life. .. We are coming to see that more is not necessarily better, but it is extremely difficult to do better with what we have. ... We must enter the eighties in a sombre mood. Some of our problems have been on our agenda for thirty years without coming close to resolution. Our newer ones may get worse as the troubles in the oil-producing nations continue,

In the final analysis all the social problems arising from population change and development cannot be resolved internally by the small island states themselves. As a colonial heritage has demonstrated, the western world was not able to weather either its demographic transition or the urban-industrial revolutions without massive exodus of population. Opportunities for emigration have long

been essential in the eastern and central Pacific. The need for such outlets for Melanesians will certainly arise in the twentyfirst century. But this is the subject of another paper for another conference organised by SPC and ILO on migration, employment and development in the Pacific islands.

ACKNOWLEDGEMENT

While preparing this paper I had the opportunity of discussing aspects of population change and development with Diana Howlett who is completing a major review of future prospects for several Pacific countries. I have tried to acknowledge her contribution by numerous references in the text to her forthcoming study.

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A pattern of populous islands

Vol. 4, No 2, 1977

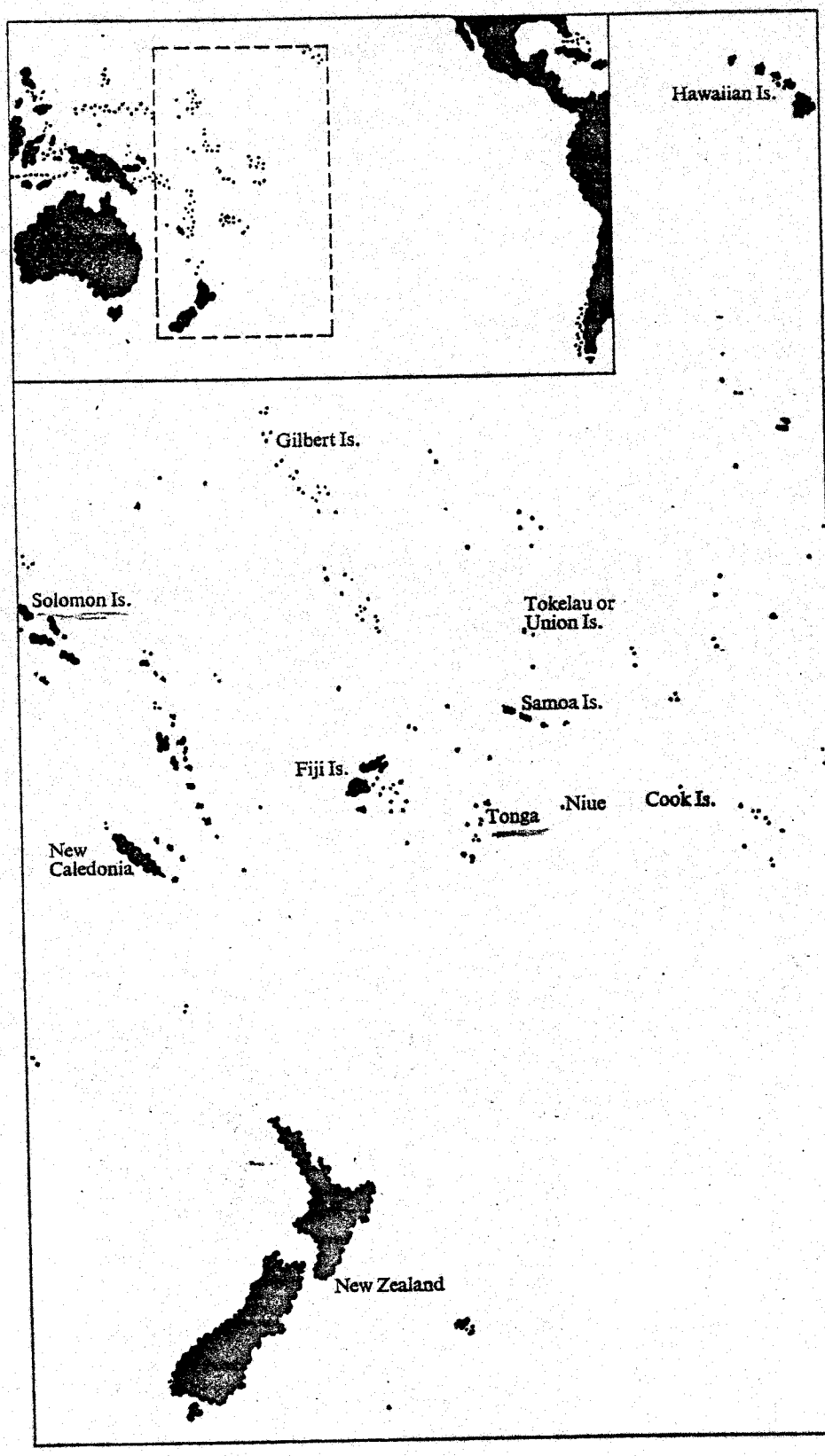
The vulnerability of islands to sudden fluctuations in population is nowhere more apparent than in the Pacific, where one and a half million people are spread through a pattern of far flung isles and atolls.

As Judy Tudor points out overleaf in the first of our articles on this often overlooked part of the planet, the problem not all that long ago was of serious population decline in the face of sudden encounter with European traders. More recently population growth has been extremely rapid, accompanied by the familiar pressures of urban and overseas migration, and social upheaval.

According to Edward Dommen, who discusses recent migration trends on the next page, the pull of the growing towns and cities has been more important than the growth of numbers in bringing these population movements about. Joris de Bres on page 22 sees New Zealand as having a special responsibility to ease the islands' transition to developed economies and stable population through liberal immigration policies.

Other contributors have no doubts about the importance of sheer population pressure in exacerbating island problems and the need for enlightened family planning policies. Correspondents in Fiji and the Gilbert Islands outline the success which such policies are having. In both cases there is a lesson in the do-it-yourself approach, involving a clear government lead and local community involvement.

Fiji - P. 24



The Pacific pendulum

Most Pacific islands have experienced rapid population growth rates during the past 50 years. But it was not always so: the present picture marks a dramatic change over the situation in the 19th and early 20th centuries. Judy Tudor, an Australian journalist, gives a historical perspective.

The first century of real European contact with the Pacific islands saw a rapid decline in all their populations. The reasons are not hard to find.

In the first half of the 19th century, the islands were visited by traders and runaway convicts from penal establishments in New Caledonia and Australia who introduced hard liquor and firearms plus diseases to which the islanders had no immunity.

In the second half of the century, after the establishment of the sugar industry in Queensland and cotton and sugar in Fiji, thousands of Melanesians were "blackbirded" (ie shanghaied) by operators of vessels supplying labour to plantations. At about the same time the Polynesians of Easter Islands were being taken to South America for forced labour on the guano deposits.

During this period European settlement occurred in most island groups, missionaries arrived with a concept of sin hitherto unknown, and finally there was annexation by western powers.

By the beginning of the 20th century the more easily accessible Pacific islanders had become demoralized, confused and in some cases had lost the ability to reproduce themselves. The mid-19th century population of Fiji, for example, was put at an estimated 200,000 but at the end of the 1860s it was 170,000. A devastating measles epidemic in 1875 killed 25 per cent of the population. The total Fijian population at the beginning of the new century was 95,000 and continued to decline for the next 20 years, the 1918-19 influenza epidemic carrying off more thousands. The census of 1921 found that there were 84,500 Fijians living on the islands. The picture in Samoa was much the same: it too reached its lowest population in the early 1920s.

From this point Samoa, Fiji and most other island groups staged a dramatic population recovery, helped to some degree by better health services provided by governments and missionaries (though these were rudimentary in modern terms), but more importantly by the fact that the people themselves were coming to terms with their new circumstances. Today the population of Western Samoa is about 150,000 and in Fiji there are approximately 250,000 Fijians and close to 300,000 Indians – descendants of the indentured labourers taken to Fiji between 1879 and 1916 to work the plantations.

When Oceanic populations began to increase about 50 years ago the fact was hailed with surprise and pleasure. It is only in the last decade or so that population growth has been seen as a serious problem, although Fiji, because of the large number of imported labourers, and the Gilberts, because of their meagre land area, have had an obvious problem for longer than that.

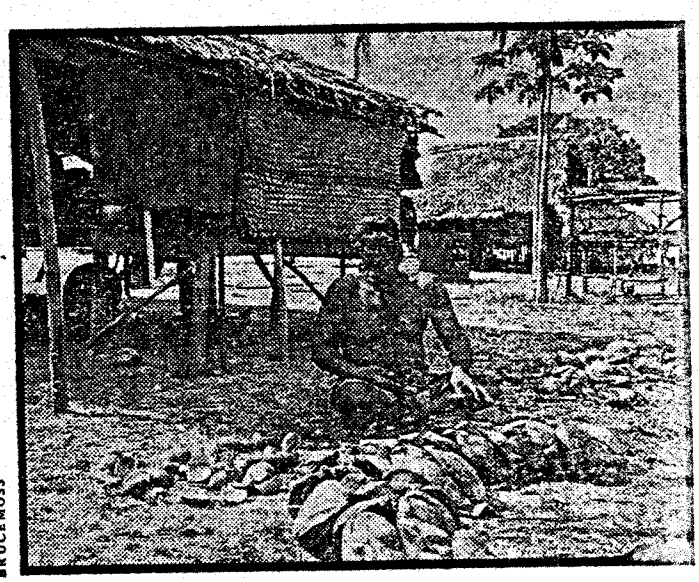
The resources of most Pacific islands are limited in one way or another, yet most islanders have learned to live in a way unknown to the subsistence farmers who were their ancestors and now have aspirations based on wishful thinking rather than on hard economic facts.

Since the second world war, western-style education has

Samoan mother and child (below): islanders have come to terms with modern changes.
The Gilbert Islands have limited resources (right): copra – here being dried in the sun – is one of the main cash sources.



BRUCE MOSS



COI

become a fetish and once a youth has become "educated" he usually scorns all manual work and sets his sights on a white collar job, in the security of government service if possible. An oversupply of would-be clerks and other seekers of the good life therefore drifts into towns and larger centres to become disillusioned, unemployed, to swell squatter settlements and to exert pressure on the authorities for social services once taken care of by the extended family unit back in the village.

For one reason or another – small land area, rapidly growing populations, increased expectations, industrial inroads into subsistence farming – no Pacific island, even the well endowed, is without people problems.

Various expedients for putting things to rights tease the minds of indigenous administrations and their expatriate advisers. Jobs are reserved strictly for local people except in specialist categories where expatriates are allowed to enter for short-term contracts; there are campaigns to boost local manufacturing which frequently is on such a small scale that it cannot succeed economically; or to grow food to take the place of an increasing reliance on canned and imported goods.

In the last decade tourism has been looked upon as the hopeful panacea, even by such island territories as the Cook Islands and Western Samoa which formerly set their faces against it as being un-Polynesian.

Attempts have also been made, where it is feasible, to skim off "surplus" populations. The Gilbertese, who have outbred the capacity of their atolls to support them, were for some years in the 1950s resettled in the British Solomon Islands. After a few thousands had migrated the Solomon Islanders grew resentful and the plan lapsed. There is also spontaneous migration, for example of Cook Islanders to New Zealand where they have citizen status. American Samoans have traditionally migrated to Hawaii and the western seaboard of the United States. But migration generally has had a limited value as a solution to population pressures in the islands and as each group achieved independence doors have been closed, even between Polynesian islands with blood ties.

All island governments pay lip service to family limitation but with one notable exception it has not had much impact to date. The exception is amongst the Fiji Indians who, over a space of 10-15 years, have reduced their birth rate from 44 per 1,000 to under 30. This rate is at least twice as large as in affluent Western societies but is regarded as an achievement.

Population growth in Oceania is uneven, but all island groups are now producing more babies who have a good chance of growing into adults. In some islands population has quadrupled in the past 50 years and these are usually the smallest and poorest in natural resources. A hundred years ago it was believed that most island populations were heading towards extinction and that the best that could be done was to ease their passing. Now the pendulum has swung the other way and the problem is to help them provide for their future.

Migration and the money chase

Thousands of Pacific islanders decide to leave their homes each year, either for the islands' growing towns or for further shores. But it is an over-simplification to attribute this simply to the pressures of overpopulation, as Edward Dommen explains.

The Pacific is a very large ocean scattered with very small islands – so small that most would be invisible on a world map drawn strictly to scale. The Gilbert Islands, for instance, extend 4,500 kilometres (2,800 miles) from eastern to western extremity – a similar distance to that which separates the east and west coasts of the United States – but their total land area is no more than 750 square kilometres (290 square miles). The total population of the South Pacific islands is about 1.5 million.

By and large they are healthy places. Infant mortality, which reflects both nutrition and general health standards, is less than half that in continental countries with similar levels of income per head: 3.5 per cent as against 8 per cent. Malaria is unknown except in Melanesia. Malnutrition is new to the South Pacific. Overweight and the illnesses caused by it are more common.

The islanders are blessed with a benign environment. On the islands which were formed volcanically the soil is fertile. On coral islands it is less so, but a sufficient variety of plants can still be grown and the sea also provides food. One consequence is that, in a working week of only 20-30 hours, the rural population of the islands is able to maintain itself in a state of "subsistence affluence" in which basic material needs are not just satisfied, but well met.

Despite this, migration is the most noticeable demographic feature of the South Pacific, involving movement firstly from the outer islands or rural areas to the towns and secondly to the major centres of the Pacific rim – the west coast of North America, Hawaii and New Zealand in particular.

Although Western Samoa, for example, is estimated to have had a 3 per cent per year natural increase in population since 1972, emigration has almost entirely cancelled this out: total population is estimated to have grown by only 0.2 per cent in 1974. However the capital, Apia, has been growing by about 3.5 per cent per year.

During the late 1960s the urban population of the Solomon Islands grew by 11 per cent per year and that of the Gilbert Islands by 17 per cent. The populations of the smaller island territories which lack urban amenities but whose inhabitants enjoy access to New Zealand have actually declined through emigration. Most dramatically, the population of Niue dropped from 5,000 in 1971 to 3,900 in 1974.

The total number of emigrants is, however, relatively small. For instance, islanders made up only 7,000 out of 124,000 immigrants to New Zealand in the two years 1972-74 (6 per cent.) Nor must it be assumed that emigration will continue to the point where the islands become totally depopulated; the

population of the three unpromising atolls of the Tokelaus, after a period of decline encouraged by official assistance to those wishing to resettle in New Zealand, appears to have stabilized around 1600. Indeed some Tokelauans may be returning, finding the cosy island society, even with its limited affluence, more congenial than the money chase in New Zealand.

The rural areas of the "high" (volcanically-formed) islands at least do not suffer from population pressure. The people live along the coasts while the interior remains almost empty. Archaeological evidence suggests that the interior of many islands was densely inhabited in the past. Soil, water and climate inland are good. The areas could be reopened. People could derive a standard of living similar to what they enjoy on the coast. If they do not do so, it is surely because they are not under pressure to do so.

The cause of migration is rather the spread of money-based consumption culture. On the one hand there is the attraction of the goods which money can buy, and for a young person the freedom from the responsibilities of membership in a cohesive social group. On the other hand, communications with outer islands are deteriorating, largely because of growing labour costs not only on the Pacific rim but also in the urban centres of the islands themselves. As a result not only are transport costs rising – which reduces the outer island producer's share of revenue from export products (mainly copra) and increases the price of supplies purchased from the capital or abroad – but shipping is also becoming more infrequent and unpredictable.

Whether the migrant is pushed or pulled, he moves not just from place to place, but from one culture to a quite different one. The island towns may be small by world standards, but they are big enough to experience the problems found in rapidly growing cities elsewhere in the developing world: crowded living conditions, dependence on wage employment (which may be scarce) to provide food and other basic needs, absence of family ties and consequently a weaker system of child care.

The islands' population problem shows itself in overcrowding and social problems in towns and a low proportion of workers in the rural population. Both are consequences of migration, which in turn reflects the success of alien consumption habits in hampering self-reliant development.

The argument that the islands are overpopulated or that population growth itself has hindered development is unconvincing. The solution to the population problem lies primarily in finding a better balance between the rural and urban, monetary and non-monetary facets of development. Pacific island governments are conscious of this need and are responding to it.

Nonetheless, family planning programmes have been outstandingly successful in some island territories – Fiji and the Gilbert Islands for instance. Whatever the national demographic situation, family attitudes are changing. The money economy is spreading. Money, unlike non-monetary goods and services, is hard to come by; and children who may have contributed to traditional activities are now being seen more as a drain on the family's money resources. Besides, women in the Pacific as elsewhere do not always relish the prospect of a life of non-stop childbearing: they respond to the offer of the means to have children only when they wish.

Edward Dommen was for seven years a roving economic adviser in the Pacific and is still working on the problems of island developing countries. For three years he was head of the Economic Planning Unit in Mauritius and professor at the university there. Mr Dommen and his wife write about Mauritius on page six.

New Zealand closes the door

Many islands in the South Pacific have looked to the nearest developed country, New Zealand, to provide relief from population pressures by providing employment for migrants. But the world recession and a change of policy in New Zealand has closed this safety valve and hit the island economies. Joris de Bres, a New Zealand journalist, reports.

On the night of 21 October 1976, police in Auckland, New Zealand, questioned Polynesians at random in the street arresting people who were unable to produce passports or other evidence that they were legally entitled to be in the country.

The random checks were a traumatic experience for the 80,000 or so Pacific islanders living in New Zealand who found themselves under suspicion irrespective of their resident status. Responsible migrant organizations claimed a South African pass system was being introduced.

A week later the New Zealand government called off the campaign after a storm of protest throughout the country.

The whole affair was an explosive climax to a problem that had been simmering for several years. "Overstayers" – people who had overstayed temporary work or holiday permits in order to continue working in New Zealand – had been the target of government attention throughout 1976. With a high unemployment rate resulting from world recession, and with a mandate to "cut immigration to the bone", the newly elected National government took drastic steps to curb migration. Pacific islanders and Europeans alike from an average gain of 30,000 in each of the previous three years to a net loss of over 4,000 in their first year of office.

At each census since 1961 the number of people of Pacific Island extraction in New Zealand has almost doubled, both



The number of passengers carried by the three flights each week from Tonga to Auckland, New Zealand, has dropped dramatically since immigration was cut back.

a result of continued migration and of their high rate of population growth.

Initially the bulk of Pacific Island migrants to New Zealand came from the Cook Islands and Niue – whose people had New Zealand citizenship and therefore free entry – and from Western Samoa, a former New Zealand colony which was given a quota of 1,500 migrants per year under a treaty signed upon independence in 1962.

Migration from the Cooks and Niue began to level off in the early 1970s but not until there were more Cook Islanders and Niueans in New Zealand than were left in their home countries. Serious depletion of manpower resulted and the respective governments have since encouraged migrants to return.

Population pressure in Tonga and Western Samoa, both islands with very limited land resources, led to a dramatic increase in migrants seeking readily available jobs in New Zealand's boom economy in the early 1970s.

Most of this new migration was illegal. Although Samoa had an immigration quota, many Samoans were unwilling to wait up to two years to get to the top of the list, came on three month visitors' permits and simply remained in New Zealand, where both government and employers were only too willing to overlook irregularities to take advantage of the favourable economic climate for increased production.

Tonga had no arrangement with New Zealand for permanent migration, but according to the Tongan Department of Statistics, migration to New Zealand increased from an average of about 500 people a year in the 1960s to an average of over 4,000 in 1973 and 1974. As more than 40 per cent of Tonga's 100,000 population was under the age of 15 at that time it would appear that almost one in four Tongans between the ages of 15 and 60 and one in every three males came to New Zealand in the early 1970s.

In the case of Western Samoa (population about 150,000), the net migration loss also increased to an average of some 4,000 per year in this period and the population growth rate decreased from 3.3 per cent in 1972, 0.5 per cent in 1973 and 0.2 per cent in 1974.

Apart from the safety valve provided by migration in terms of population pressures on the small islands, the large scale movement to New Zealand in the 1970s also provided an increasing source of foreign exchange and income in the form of remittances. In the case of Tonga, remittances trebled between 1973 and 1974 to T$2½ million, sufficient to offset a growing trade imbalance of four to one with New Zealand. It is estimated that remittances to Western Samoa reached more than WS$5 million in 1975, compared with the Samoan government's revenue for that year of an estimated WS$15 million.

The remittances sent home were a welcome addition to family budgets in villages on Tonga and Samoa and helped to pay school fees, buy food, and in particular to build more durable houses. The "New Zealand house" became an immediate symbol of new prosperity even in the remotest villages.

The change in New Zealand's immigration policy and the slump have sparked off an economic crisis in both Tonga and Samoa. The impact is likely to be worsened by the New Zealand government's plan to repatriate some 2,000 to 3,000 "overstayers" who were turned down for permanent residence earlier in 1976 after coming forward under a government "stay of prosecution" for illegal immigrants. Both the Tongan and Samoan governments have pleaded with New Zealand to grant them permanent residence because, they fear, their economies will be unable to re-absorb them.

The removal of the "population safety valve" also threatens to cause a more long term crisis. Tonga already has one of the highest population densities in the world – 347 people per square mile compared with 216 in China. The density on the main island, Tongatapu, has already reached 677 people per square mile. In Samoa the density in 1971 was 136, with the main island (Upolu) having a density of 252. This compares with 27.7 people per square mile in New Zealand in 1971.

With a predominantly young population in Tonga and Western Samoa, even the significant but limited success of family planning will do little to ease the islands' population pressure and growth before the end of the century, and they have looked to New Zealand as a relatively underpopulated, developed country to assist them over this bridging period.

It now appears that New Zealand is unlikely to fulfil this hope. Permanent migration is likely to continue to be severely restricted and while temporary work schemes for Pacific islanders are likely to bring relief in times of economic upswing, they will leave Tonga and Samoa with basically unstable and dependent economies. Particularly in times of recession they will be left with a diminishing economic base to support a continuing increase in population.

Even with an upswing in the New Zealand economy, the policy of concentrating on temporary work schemes rather than permanent migration means that Tonga and Samoa can at best only hope to become glorified nurseries and retirement homes for New Zealand labour power, which will increase the demand of non-productive citizens on already inadequate social services. The proposed system has drawn comparisons within New Zealand with the South African homelands policy.

New Zealand has promised more aid to offset the cutbacks in immigration, but it is unlikely that the small and geographically isolated economies of Samoa and Tonga will ever be able to support the export industries necessary to achieve any degree of self-sufficiency. With all its disadvantages, the export of migrant labour for a few years held out the promise of increased overseas earnings and decreased population growth. The future now offers no such easy solution.

Joris de Bres himself emigrated to New Zealand, from Holland, in 1954. He has written many articles, papers and booklets on migrant labour in the Pacific and regularly visits the islands.

Fiji: Striking out for success

Fiji's family planning campaign has been described by Rafael Salas, executive director of the UN *Fund for Population Activities, as "one of the success stories of the world." Here Seona Martin, a local journalist, reports on that success and its implications for the rest of Oceania.*

Every three months over 3 million matchboxes are sold in Fiji – each one of them carrying a family planning message. Assuming that it is noticed every time a match is struck, this one message is communicated 138 million times over that period.

Such ubiquitous publicity is a long step from the situation of the 1950s when the government's medical department began supplying a few contraceptives through one of its outpatient clinics. "Softly, softly" was the motto. "Family planning advice must be spread over the rattle of the teacups," advised the head of the department.

But by the time a new director of medical services, Dr Charles Gurd, came onto the scene in the late 1950s attitudes had begun to change. It was possible to demand that family planning should be regarded not just as a medical matter but as one of national concern. With full government backing, the campaign was launched.

The local family planning association came into existence at about the same time and, under the leadership of Suva lawyer Robert Munro, president of Fiji's Senate, has worked closely with the government health services to spread the message.

From the beginning emphasis was placed on the maternal and child health benefits of family planning. It was quickly noted that Fijian women would attend a health clinic and discuss contraception but were reluctant to enter a clearly labelled family planning clinic. All doctors, nurses and midwives are considered family planning officers and family planning is part of their training. The resulting domiciliary work has played an important role in spreading the services throughout the islands and remote inland areas.

The medical services use clinics and health workers to distribute contraceptives, to give advice and distribute information provided by the FPA. This takes the form of leaflets, a recent multilingual booklet and other publicity material which aims to get simple messages across on the need for birth planning and how to go about it. In co-operation with the government the FPA also supplies condoms over the counter at the very cheap price of 1 cent and pills for 10 cents a pack.

Enthusiasm for family planning was growing even before the programme began, particularly among the Indian community. Indian families, who make up rather more than half the island's population, were quick to accept the economic argument that a smaller family meant more money to educate each child. In general they own little land and find their livelihood in commerce and the civil service.

Fijians, being land owners, were slower to accept such arguments and had some initial fears that family planning was a threat to their own ethnic group. But as time went on this has largely disappeared, although the ethnic composition of the population was delicately balanced in 1975 with 250,883 Fijians, 288,408 Indians and 30,177 others.

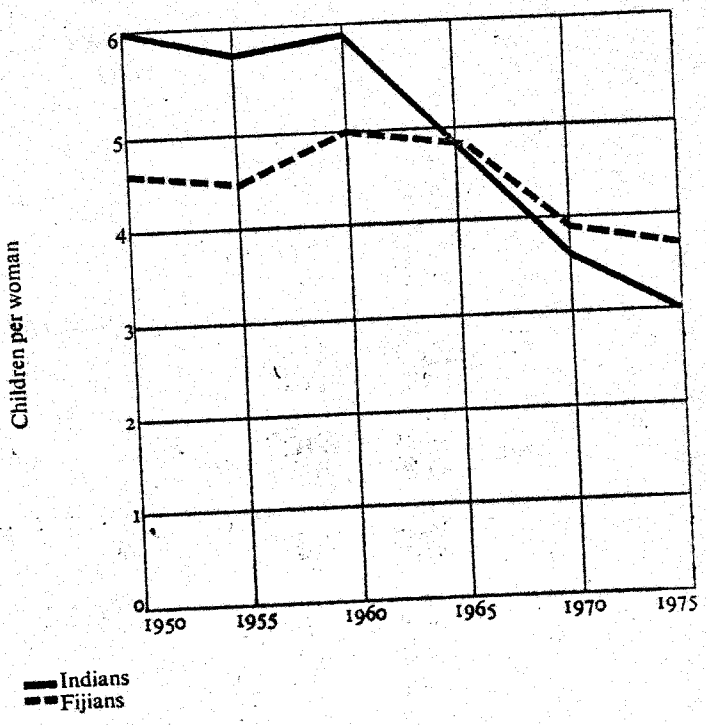
By 1975 Fijian and Indian birth rates were officially stated to be identical at 28.71 per 1,000. The graph shows the considerable drop in fertility of women in both ethnic groups over the past two decades. It also shows that Fijian women tend to have more children than those of Indian background – a reversal of the situation before the mid-1960s.

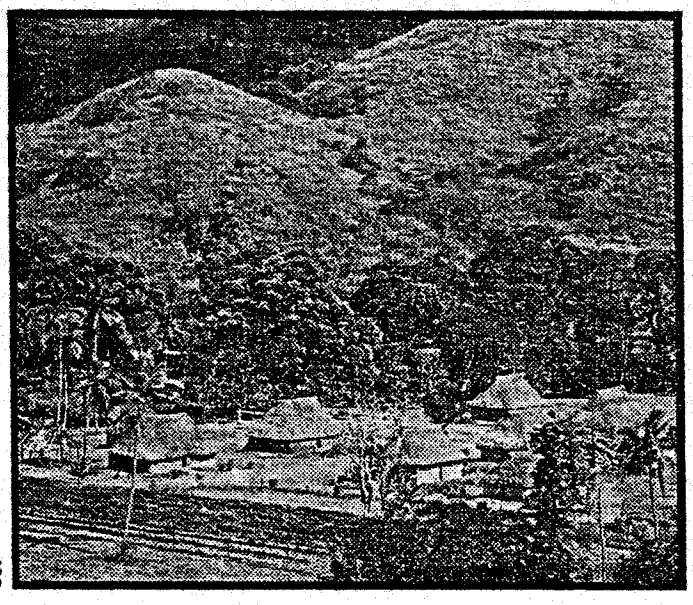
With a death rate of 6.89 per 1,000, Fiji's population growth rate was 2.2 per cent per year in 1975, compared with 3.4 per cent in 1950.

Fiji's seventh development plan, covering the period from 1976 to 1980, includes the aim of reducing national growth of population to less than 2 per cent per annum and achieving a national average two child family – a goal that appears attainable in a small country with a comparatively small population and well-developed health, education and communication services. By the end of 1975, more than 23 per cent of all women aged 15-44 were already protected against pregnancy by using reliable family planning methods.

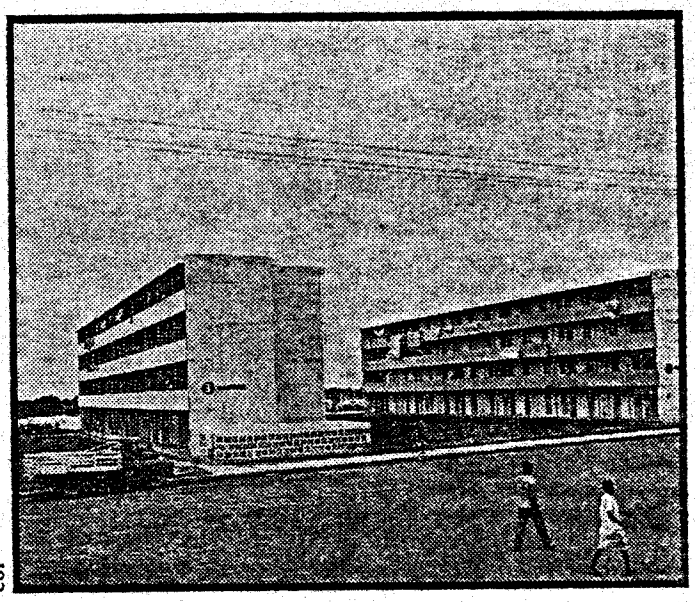
Senator Munro believes Fiji has gained a great deal, both in terms of human happiness and economic advantage, through its family planning policies. Education has still got some way

Official statistics show sharply decreasing fertility of Fijian and Indian women.





Nakalalo village on Fiji's main island.



New housing estate in Suva, capital of Fiji.

to go in terms of quality, but it is estimated that the family planning campaign and the increase in the legal marriage age for Indian girls to 16 has meant that there are 50,000 fewer schoolchildren to cater for this year, saving 1,500 extra teachers and a similar number of extra classrooms. Unemployment remains a serious problem, but would be much worse but for family planning.

"Fiji, like other family planning 'success' countries, has shown conclusively that if people are motivated to family planning, services are made easily available and their country is advancing socially and economically, they will quickly control their family size," Senator Munro said.

He sees the factors in lowering the birth rate as: a country-wide campaign with wide publicity over radio and in the press; the integration of family planning with maternal and child health services; and vigorous national, social and economic development.

Every health centre has become a family planning centre with field staff providing a full range of contraceptive methods, while in its publicity campaign the Family Planning Association has made particular efforts to get the support of community leaders, politicians, government ministries, women's groups and churches and has emphasized the interests of the family, not the theme of national population control.

So far abortion has been kept out of the family planning debate, though controversy over the subject has arisen in Fiji as elsewhere.

Senator Munro believes there is still a good deal to be done if the family planning programme is to reach all those who need it.

Apart from improving the quality of the present services he is in favour of raising the minimum age of marriage from 18 for boys and 16 for girls to 21 and 18. He would like to see family planning workers communicating with all branches of industry, on housing estates and in youth, adult and professional groups. He wants family planning leaflets and clinic invitations to be supplied with marriage licences and birth registrations.

He believes too that efforts should be made to make population and sex education a subject in schools and colleges. Indeed the need for sex education throughout the South Pacific is highlighted by the various Fiji-based regional organizations which take students from the island groups.

The University of the South Pacific has an unrecorded but alarmingly large dropout rate of female students because of unwanted pregnancy. One group of male students was even discovered to be taking the pill, under the mistaken impression that this would prevent their wives or girl friends from becoming pregnant.

Senator Munro sees this lack of information as symptomatic of the wider failure of many island governments to evolve population and family planning policies, made worse by traditional and missionary attitudes, difficulties of communication and a lack of awareness that family planning is an essential element in development, not only to improve the health of mothers and children but to ensure better opportunities for girls to be educated.

He believes Fiji has shown that lavish funds and expensive expatriate personnel are not necessary, but that motivated governments and a few dedicated individuals are.

Where Malthus and large families both make sense

Scattered across the Pacific Ocean where the International Date Line crosses the Equator, the Gilbert Islands are a kind of microcosm of planet Earth. The 60,000 or so people who live on the 16 inhabited islands are isolated by great distance and time from the rest of mankind. Historically they have recognized the necessity of balancing their numbers with resources and in recent years they have readily taken to modern methods of family planning. But they still find it logical to opt for the four- to six-child family. John Pitchford reports.

With their world but a peeling of coral set in an immensity of ocean and their subsistence depending on the vagaries of nature, it is not surprising that most Pacific island communities anticipated Malthus by several centuries. In pre-contact days families in the Gilbert Islands, for example, were limited – sometimes to only two children – by decree of the Island Council of Old Men.

Then along came Development, offering a sort of qualified freedom from keeping population size within the perspective of so blatantly finite an ecosystem. With its improved health care and better opportunities for everyone, development tended to create spiralling expectations and birth rates, and urban drift which put the whole object of the process at risk – or so it seemed in the Gilberts. This obviously would not do, especially when the known exploitable natural resources of the islands were virtually limited to copra and a dwindling amount of phosphate rock. So the obvious was done, perhaps with rather more singlemindedness than in some other places, and four years after the family planning campaign started in 1968 well over a third of women aged 15-44 were using reliable contraceptives.

The 1973 census showed that the birth rate had dropped sharply from 2.3 per cent per annum in 1963-68 to 1.7 in 1968-73, despite all indications that there would be a bulge in births.

Delivering family planning can mean wading to work.



But the Gilbertese did not produce standard 2.6 child families and live happily ever after. Although at least three-quarters of contraceptive users were rural dwellers, subsistence farmers still required four to six children, according to a 1972 survey by the Family Planning Association of the Gilbert Islands.

If you and I were intelligent, pragmatic, adaptable, mainly subsistence farmers/fishermen like most Gilbertese, making a few dollars on the side by selling copra when the spirit (or the world price) moved us and getting almost as much in remittances from our brighter children who had managed to get a job in urban Tarawa, the capital, we too would probably strive to produce five or six children. Anything less and we should not be able to look after our lands adequately, fulfil reciprocal obligations within our kinship groups, the church and community or enjoy security in our declining years. A two-child family makes no sense but, on the other hand, contraceptive methods to improve the health of mothers and babies or to keep family size within reasonable bounds make very good sense indeed.

So arises something of a development dilemma. In the face of ever-rising expectations, how can rural islanders be persuaded to adopt a family size appropriate for an urban environment (which so often happens to be the size the government or the family planning association thinks is best for them) when they know this just won't work back on the farm?

In the Gilberts it has been recognized since its inception that the family planning campaign is only a fraction of the sort of investment needed to bring about a lasting small family norm throughout the islands. The Gilberts' rural development programme has therefore been geared to population: decentralization; investment in rural areas; rural youth programmes; promotion of economic activities for women and priority for raising their status; involvement of the church; security for old people; and the most mind-bending task of all, gearing development to ensure that the goodness and serenity of traditional Gilbertese community life will not be usurped by an acquisitive, individualistic rat race. All these and more, are being pursued with a vigour not usually associated with the tropical Pacific.

The Gilbertese will probably adjust their fertility to whatever the future holds for them, as indeed they have done throughout their history. Certainly few other Third World countries seem to have embraced modern contraceptive technology with such alacrity and zeal; but the almost universal use of family planning is but the easiest and cheapest part of the Gilbertese programme "for the control and reduction of the rate of population growth" underlined as essential in every development plan since 1970.

John Pitchford is head of the Division of Community Affairs in

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POPULATION CHANGE IN THE PACIFIC REGION

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URBANIZATION AND MIGRATION IN SOUTHEAST ASIA

*Sidney Goldstein**

In its assessment of the world social situation in 1974, the United Nations noted that in both more and less developed countries, ". . . economic and social policy discussion reflects a new and growing emphasis on distributional objectives" (United Nations Economic and Social Council 1974b, p. 22). Such a concern can, in fact, be said to encompass two aspects of distribution. The first relates to the wide disparities in the level of living and quality of life that characterize the world scene, but particularly the less developed regions. The second concerns the ever increasing concentration of people in urban places and particularly in big cities. This latter process in many instances is accompanied by a number of adverse factors, including the migration from rural areas of persons who cannot then be absorbed by productive employment in urban areas; serious disequilibrium in the growth of urban centers; contamination of the environment; inadequate housing and social services; and social and psychological stress (United Nations Economic and Social Council 1974a, p. 15).

Within any given country, these two aspects of maldistribution, the vertical and the horizontal, are interrelated. A major factor in the rural-urban shift in population is the actual or the perceived disparities in economic opportunity and in social and cultural amenities between urban and rural areas. As a result, for many countries, rural to urban migration, and especially migration to big cities, results in increasing spatial polarization. Concurrently, to the extent that such migration is not fully justified by the economic development of the city, it results, together with rapid urban natural growth, in perpetuating massive urban poverty in the midst of those locations which also represent the economic, cultural, social, political, and usually most modern centers of the

*Population Studies and Training Center, Brown University, U.S.A. Support received from the Ford Foundation and the National Institutes of Health, Department of Health, Education, and Welfare (Contract No. NIH-70-2190) is gratefully acknowledged.

nation. The net result is that both economic and spatial polarization become mutually reinforcing (Findley 1974).

The problem is complicated by the failure of many governments to give adequate attention, either in research or in policy formation, to the importance of the urbanization process as a factor in national development (United Nations Economic and Social Council 1974c). In part, this may well reflect the difference of opinion, even on the part of experts, as to the exact role of urbanization in the development process. Some argue that expansion of the modern sector requires some polarization to obtain economies of scale; others maintain that such a relation is inconsistent with the long run regional and national development goals and results in tremendous loss of human potential in rural areas and overpopulation in urban places (Findley 1974, p. 95).

To compound the situation, while the cities of the less developed world are growing at a rapid pace and an ever increasing proportion of the total population is concentrated in them, the rate of rural growth continues to be high; and a very significant proportion of the total population of most less developed countries continues to reside in rural areas. To the extent that the critical problems of the cities reflect in many ways the even more serious problems in rural areas, any concern with urbanization must inevitably also give concerted attention to rural population and to rural development; but in so doing, the close interrelations between rural and urban growth and development must be recognized, lest efforts to solve the problems of one actually lead to exacerbation of the difficulties of the other.

Levels of Urbanization

Although still one of the least urbanized regions in the world, Southeast Asia, like other less developed regions, has begun to experience rapid urban growth. The data used in this analysis on urban and rural population are based on the most recent United Nations Population Division (1975) estimates. As a result, the levels and rates of urbanization cited here may be different than those appearing in earlier reports, although in most instances the differences are not great and the basic patterns are quite similar. The United Nations has not yet made available updated estimates for either the components of urban and rural change or for the growth of big cities. For this reason, the earlier data continue to be used for analysis of these aspects of the urbanization process. At the same time, the rural population of Southeast Asia also continues to grow at a high rate. The leaders of many of the nations of Southeast Asia have recognized that rapid population growth poses a major threat to the achievement of their economic goals, and, as a result, a number of nations have initiated vigorous efforts to limit population growth (Stamper 1973; Keeny 1973). Much less research and policy attention has been given to the differential pace of population growth in urban and rural places and to the implications for development of the changing patterns of

TABLE 1
Urban, Rural and Total Population for the World, Major Regions, and Southeast Asia, 1950–2000

Region	Urban Population	Rural Population	Total Population	Percent Urban	Annual Average Growth Rate[a] Urban	Rural
	(in millions)					
World Total						
1950	715	1,787	2,501	28.6	—	—
1960	1,007	1,979	2,986	33.7	3.4	1.0
1970	1,350	2,260	3,610	37.4	2.9	1.3
1975	1,558	2,409	3,967	39.3	2.9	1.3
1980	1,800	2,574	4,373	41.2	2.9	1.3
1990	2,386	2,893	5,279	45.2	2.8	1.2
2000	3,103	3,150	6,253	49.6	2.6	0.8
More Developed Regions						
1950	457	400	857	53.4	—	—
1960	586	390	976	60.1	2.5	-0.3
1970	718	366	1,084	66.2	2.0	-0.6
1975	783	349	1,132	69.2	1.7	-1.0
1980	850	331	1,181	71.9	1.6	-1.0
1990	984	294	1,278	77.0	1.5	-1.2
2000	1,107	254	1,361	81.4	1.2	-1.5
Less Developed Regions						
1950	257	1,387	1,644	15.6	—	—
1960	421	1,589	2,010	20.9	4.9	1.4
1970	632	1,893	2,526	25.0	4.1	1.8
1975	775	2,060	2,835	27.3	4.1	1.7
1980	950	2,242	3,192	30.0	4.1	1.7
1990	1,402	2,600	4,001	35.0	3.9	1.5
2000	1,996	2,896	4,893	40.8	3.5	1.1
Southeast Asia						
1950	23	150	173	13.4	—	—
1960	37	180	217	17.0	4.6	1.8
1970	58	226	283	20.0	4.3	2.3
1975	72	252	324	22.1	4.6	2.2
1980	90	281	371	24.3	4.6	2.1
1990	140	338	479	29.3	4.4	1.9
2000	207	385	592	35.0	3.9	1.3

[a] Rate refers to previous decade, except for 1970–1980 where the two figures refer to the 1970–75 and 1975–80 periods respectively.

Source: United Nations Population Division, *Trends and Prospects in Urban and Rural Population: 1950–2000, as Assessed in 1973–1974*, New York: United Nations, 1975.

population distribution.

Continued rapid population growth and the attendant increasing pressures on resources probably contribute to rapid urban growth in Southeast Asia, adding one more argument in favor of slowing total growth rates. Yet it may well be that solutions to the problems of high population growth lie, at least in part, in the success with which the pace of urban growth and particularly

the distribution of the growing urban population can be controlled so that it contributes more effectively to national and regional development.

The present pattern of urbanization in Southeast Asia and its future course in the next quarter century can best be evaluated in the broader context of the worldwide situation, and particularly in relation to the differential patterns that characterize the more and less developed regions of the world. The level of urbanization in the less developed regions of the world has continuously been considerably below that of the more developed regions (Table 1). However, judged by the increases both in the absolute number and in the percent of the population in urban places, by the increase in the number of big cities and the percent of the population living in them, and by the rate of population movement from rural to urban places, the LDCs are already and will, in the remaining quarter of the century, be faced by massive challenges resulting from the fast pace of urban growth and the large numbers of people involved.

In microcosm, Southeast Asia closely parallels the patterns of urban growth and changing levels of urbanization that characterize the less developed regions as a whole. It is still one of the least urbanized regions in the world, because, although Southeast Asia has begun to experience rapid urban growth, the rural population also continues to grow at a rate higher than either that of the world as a whole or its less developed regions. At mid-century, only 13 percent of Southeast Asia's total population of 173 million persons were living in urban places. This increased to 22 percent by 1975, a level well below the 39 percent for the world as a whole and also below the 27 percent of the LDCs. Because Southeast Asia is expected to have a faster pace of urbanization in the last two decades of the century, its level of urbanization is projected to rise to 35 percent by the end of the century. If these projections prove correct, the level of urbanization in Southeast Asia will still be below the 40 percent level characterizing the less developed regions in general at that time. This also means that Southeast Asia will still be heavily rural as it moves into the twenty-first century. Such a situation in particular must be anticipated in any concern for development and planning in the last quarter of this century.

As significant as the changing levels of urbanization, and perhaps even more so, is the very marked increase in the absolute size of both the urban and the rural populations (Table 1). In the 25 years between 1950 and 1975, Southeast Asia's urban population has almost tripled from 23 to 72 million persons; and in the next 25 years it is projected to virtually triple again, reaching 207 million by the year 2000, a number equal to the total population of Southeast Asia at about 1957. While increasing at a slower rate, the rural population will undergo an even greater absolute increase, rising from 150 million in 1950, to 252 million presently, to a projected 385 million by the year 2000. According to these projections, the rural population at the turn of the century will exceed by about 20 percent what the total population of

Southeast Asia is at the present time. This strongly emphasizes the need for concern with rural population growth even while emphasizing the rising level of urbanization and the significant absolute growth of urban places.

Rates of Urbanization

Kingsley Davis (1972, p. 316) and others have questioned the common impression that the less developed countries are urbanizing with extreme rapidity. Davis points out that this illusion is based on three sources of confusion: 1) the growth of the urban population is mistaken for urbanization; 2) comparison is made between the more and less developed countries as they are at the present; and 3) use of changes in the percent urban to measure the rate of urbanization reduces the possibility of high relative gains when high levels of urbanization have already been achieved. The first problem requires a clear distinction between attention to rates of urban growth and rates of urbanization. The second calls for controlling for level of development in any assessment of the comparative rates at which more and less developed countries are urbanizing. The third is handled best by use of an index of urbanization which does not vary from zero to unity. The urban-rural ratio serves such a purpose, taking account of ranges in the absolute size of both the urban and rural populations.

In this report, the tempo of urbanization will be measured by percentage change in urban-rural ratios. As judged by such percentage changes, the rate

TABLE 2
Urban-Rural Ratio and Percentage Change in the Ratio for the World, Major Regions, and Southeast Asia, 1950–2000

Year	World	More Developed Regions	Less Developed Regions	Southeast Asia,
		Urban-Rural Ratio		
1950	0.400	1.143	0.185	0.155
1960	0.509	1.503	0.265	0.206
1970	0.597	1.962	0.334	0.257
1975	0.647	2.242	0.376	0.284
1980	0.699	2.568	0.424	0.320
1990	0.825	3.347	0.539	0.414
2000	0.985	4.365	0.689	0.538
		Percentage Change in Urban-Rural Ratio		
1950–60	27.3	31.5	43.2	32.9
1960–70	17.3	30.5	26.0	24.8
1970–75	8.4	14.3	12.6	10.5
1975–80	8.0	14.5	12.8	12.7
1970–80	17.1	30.9	26.9	24.5
1980–90	18.0	30.3	27.1	29.4
1990–2000	19.4	30.4	27.8	30.0

of urbanization in the more developed regions of the world has remained virtually constant (Table 2) between 1950 and 1975 and will continue to do so for the balance of the century. With the exception of the 1950–60 decade, the same conclusion holds for the less developed regions.

The close similarity and the relative stability in the rates of the two groups of countries strikingly supports Davis's thesis that the much faster rate of urbanization in the less developed regions is an illusion based on the rapid rate of urban growth as distinct from the rate of urbanization itself. But such a close similarity in the tempo of urbanization results from quite different underlying dynamics in the more and less developed countries. In the former, it is a product of urban growth concurrent with rural decline; in the latter, the rate of urbanization is a function of very high rates of urban growth with concurrent and still quite high rates of rural growth. In the LDCs, it is only because the urban rates of growth so far exceed the rural rates that increasing urbanization occurs at all.

The rates of urbanization for Southeast Asia follow quite closely the general pattern of the less developed countries, being highest (although at a lower magnitude) for 1950–60, declining to 25 percent per decade for 1960–70 and 1970–80, and then deviating slightly from the model projected for the less developed regions by rising to 29 and 30 percent in the last two decades of the century. As for the LDCs as a whole, this rate of urbanization reflects very high rates of urban growth and concurrently high rates of rural growth.

Components of Urban and Rural Growth

Of particular importance in the analysis of urbanization is the comparative contribution of migration and natural increase to urban growth. For such

TABLE 3a
Components of Urban and Rural Population Change for the World, Major Regions, and Southeast Asia, 1960

Region	Total Number	Total Growth	Births	Deaths	Natural Increase	Population Transfers
		Urban Population (in 1000s)				
World	986,151	32,252	27,324	11,478	15,846	16,406
More Developed Regions	565,179	13,582	11,360	5,008	6,352	7,230
Less Developed Regions	420,972	18,670	15,964	6,470	9,494	9,176
Southeast Asia	38,251	1,656	1,613	619	994	662
		Rural Population (in 1000s)				
World	1,995,470	24,851	79,440	38,183	41,257	–16,406
More Developed Regions	411,010	– 1,380	9,588	3,807	5,781	–7,161
Less Developed Regions	1,584,460	26,231	69,852	34,376	35,476	–9,245
Southeast Asia	180,278	3,938	8,410	3,810	4,600	–622

TABLE 3b
Rates of Growth of Urban and Rural Populations, 1960
(rates per 1,000)

Region	Growth Rate	Birth Rate	Death Rate	Natural Increase	Population Transfers[a] Rate	Population Transfers[a] As Percent of Natural Increase	Percent Urban Growth Due to Rural-Urban Population Transfers
				Urban Population			
World	32.7	27.7	11.6	16.1	16.6	104	51
More Developed Regions	24.0	20.1	8.9	11.2	12.8	114	53
Less Developed Regions	44.3	37.9	15.4	22.5	21.8	97	49
Southeast Asia	43.3	42.2	16.2	26.0	17.3	67	40
				Rural Population			
World	12.5	39.8	19.1	20.7	–8.2	–40	—
More Developed Regions	–2.6	23.3	9.3	14.0	–16.6	–124	—
Less Developed Regions	16.5	44.1	21.7	22.4	–5.9	–26	—
Southeast Asia	21.9	46.7	21.1	25.6	–3.7	–14	—

[a]Population gains or losses from rural-to-urban migration within the region, inter-regional migration, and rural-to-urban area reclassification.
Source: United Nations Population Division, *The Components of Urban and Rural Population Change: Tentative Estimates for the World and Twenty-Four Regions for 1960*, New York: United Nations, 1972.

purposes, the United Nations has prepared worldwide estimates for 1960 showing the relative contribution to urban and rural population change of natural increase and population transfers, defined as the combined effects of population gains or losses from rural-to-urban migration and rural-to-urban area reclassification (United Nations Population Division 1972a).

Urban natural increase in Southeast Asia was high, 26 per 1,000, and almost identical to the rate of natural increase characterizing rural places (Table 3b). Although Southeast Asian birthrates were somewhat lower in urban than rural places, both were very high (over 40) and the differential between them was small and considerably less than for most regions of the world. This suggests that fertility by 1960 had declined minimally in urban places of Southeast Asia and therefore constituted a major factor in urban as well as rural growth, especially when considered in conjunction with the considerably lower rates of urban mortality.

Because of the similarity in rates of natural increase, the major factor accounting for the differential pace of urban growth in Southeast Asia is population transfers. In 1960, 17.3 persons per 1,000 were added to the urban population through transfers from rural to urban places, a movement which in turn represented a rural exodus of only 3.7 per 1,000. While accounting for virtually all of the differential between urban and rural growth rates, population transfers in Southeast Asia explain only 40 percent of the total growth of urban places compared to 49 percent in less developed regions as a whole. The fact that 60 percent of the 1960 urban growth was attributable to natural increase emphasizes the key role of high fertility in urban growth and also suggests that if further reductions in mortality are achieved without compensating reductions in fertility and/or if the pace of rural to urban movement should accelerate, the rates of urban growth in Southeast Asia could be considerably exacerbated. But even at this comparatively low rate of population transfer from rural to urban places, the number of individuals involved is considerable. In 1960 alone, 0.7 million persons were added to the urban population of Southeast Asia through such transfers.

Yet transfers from rural to urban places did not contribute significantly to reducing the growth of the rural population itself: in Southeast Asia such transfers reduced rural growth by only 14 percent. The magnitude of the 4.6 million increase resulting from an excess of births over deaths and the small percentage of it that was cancelled out by 0.7 million population transfers emphasizes the importance of reducing fertility levels in rural Southeast Asia if increased pressures for rural exodus are to be avoided. At the same time, the urban population increase of almost one million through natural increase clearly emphasizes that efforts to control the rate of urban growth in Southeast Asia will require as much attention to control of fertility in urban places as to policies directed at diverting population movement. Even if a considerable portion of rural to urban migration were eliminated, the rate of urban growth would remain high due to the substantial contribution of

natural increase.

Big City Growth

The marked shift in rural-urban population distribution noted earlier takes on added significance because so much of the urban growth underlying the change in distribution in less developed countries is concentrated in big cities of one million or more population. Many of these big cities dominate both the urban structure and the economic, social, and political life in their respective countries. In the Philippines, for example, 80 percent of all manufacturing employment is located in Manila and its environs. In Indonesia, 30 percent of all telephones and 25 percent of all motor cars are located in Jakarta, although it contains only three percent of Indonesia's total population (United Nations Economic and Social Council, 1975). Although Bangkok accounts for less than ten percent of Thailand's total population, it contains 56 percent of the urban population, accounts for 77 percent of all telephones, about 50 percent of all autos, 82 percent of all electricity consumed, 73 percent of all income taxes collected, and 86 percent of all the university students and faculty (Romm 1972, pp. 7–8). Half of all doctors in Thailand are located in the capital. Moreover, Bangkok and its adjoining provinces generate 80 percent of the annual value of Thai manufactures and an equal percent of the contribution of financial activities to GDP. Many of the big cities of Southeast Asia are characterized by wide disparities in levels of living; most have inadequate housing, public utilities, job opportunities, educational facilities, and transport systems, reflecting the considerable part of their growth which is due to rural population pressure rather than industrialization and modernization in the cities themselves.

Reflecting its overall low level of urbanization, Southeast Asia at mid-twentieth century had only two million-plus cities, Manila and Jakarta (United Nations Population Division 1972b); but by 1970 this number had already increased to nine through the addition of Bangkok, Hanoi, Saigon, Rangoon, Singapore, Bandung, and Surabaja (Table 4). The trend toward increasing concentration of population in large cities is expected to continue, and the United Nations estimates that by 1985 Southeast Asia will have 16 such cities. Such centers as Kuala Lumpur, Haiphong, Davano, and four cities in Indonesia will be added to the list. Moreover, many of the cities which had attained million-plus status earlier will have increased their size to several million persons. Jakarta, Manila, and Bangkok are projected to have populations of at least six million by 1985.

The increasing importance of million-plus cities in the urban hierarchy of Southeast Asia is clearly evidenced in the statistics showing the percent which the million-plus city population constitutes of the total urban population. In 1950, this amounted to only 13 percent of all of the urban population of Southeast Asia. But by 1970, almost one third of Southeast Asia's urban population lived in million-plus cities, a level equal to that of the more

TABLE 4
Cities of 1,000,000 and More Inhabitants for the World, Major Regions, and Southeast Asia, 1950–1985

Region	1950	1960	1970	1980	1985
	Number of Cities				
World Total	75	109	162	229	273
More Developed Regions	51	64	83	108	126
Less Developed Regions	24	45	79	121	147
Southeast Asia	2	5	9	15	16
	Percentage of World's Million City Population in Each Region				
World Total	100.0	100.0	100.0	100.0	100.0
More Developed Regions	72.6	63.6	53.7	45.6	42.3
Less Developed Regions	27.4	36.4	46.3	54.4	57.7
Southeast Asia	2.0	3.3	4.7	5.4	6.1
	Population of New Million Cities (size after 1950) as Percent of All Million Cities at Given Date				
World Total	0	16	30	42	47
More Developed Regions	0	9	18	25	31
Less Developed Regions	0	28	44	54	58
Southeast Asia	0	45	63	71	72
	Million City Population as a Percent of Total Urban Population				
World Total	25	28	31	34	37
More Developed Regions	29	31	32	35	37
Less Developed Regions	19	23	29	34	37
Southeast Asia	13	23	32	37	42
	Million City Population as a Percent of Total Population				
World Total	7	9	12	14	16
More Developed Regions	15	18	20	24	27
Less Developed Regions	3	5	8	11	13
Southeast Asia	2	4	7	10	11

Source: United Nations Population Division, *The World's Million Cities, 1950–1985*, New York: United Nations, 1972.

developed regions of the world and above that of the less developed regions. By 1985, United Nations estimates indicate that two out of every five urban dwellers in Southeast Asia will be living in cities of a million and more persons and that this level of big city residence will actually exceed the average for both the more and the less developed regions of the world.[1] Clearly, then, in any planning for future urban and economic development in Southeast Asia, special attention must be given to the sharp rise in the number of big cities, the increase in the proportion of population contained within them, and to

[1] These projections do not reflect the growth in Saigon and Phnon Penh associated with the Indo-China War, nor declines which may result from post-war policies which lead to out-migration.

the key role which they play in the urbanization process both as potential depositories of excess rural population and as potential catalysts of overall economic and social development.

Intra-Regional Variations

Thus far, this review and assessment of urbanization in Southeast Asia has treated the region as a whole, within the context of the world scene in general and especially the less developed regions of the world. But such an aggregative treatment is misleading if it is taken to imply that all of the countries within Southeast Asia are experiencing identical patterns of urbanization. This is certainly not true. These countries vary with respect to geographic size and features, total population, level of development, political structure, natural resources, and political, social, religious, and economic history. Within the context of this brief paper, it is not possible to document these background factors or to assess their impact on patterns of urbanization. Nonetheless, it does seem in order to give brief attention to the extent to which intra-regional variations in urbanization exist now, their likely future course, and the underlying demographic dynamics accounting for the differences.

That variations in urbanization exist and that they are likely to continue to do so is clearly documented by the United Nations data showing past and projected levels of urbanization for each of the countries of the region between 1950 and 2000. Table 5 abstracts these data for three points in this 50 year time span. In 1950 the levels in particular countries ranged from a low of 5.7 in Laos to a high of 47.4 in Singapore. In the next 25 years, all of the countries experienced very dramatic population increases and all were characterized by quite significant increases in their levels of urbanization. By 1975, no country had fewer than 10 percent of its people living in urban places, and only four of the 10 had fewer than 20 percent of their populations in urban places. Yet, for most of the countries of the region, the levels of urbanization remained comparatively low; only Singapore and the Philippines were more than one third urban.

The levels of urbanization are projected to continue to vary considerably as Southeast Asia enters the twenty-first century. Again, Singapore, Brunei, and the Philippines will be in the lead; they will be the only three countries to have passed the 50 percent urban level. A large majority of the Southeast Asian countries will still be largely rural, many by a very significant proportion. Yet, over the course of a half century, most will have at least doubled their levels of urbanization, and some will have raised their levels of urbanization much more. Quite clearly, then, although the pace has differed, in all countries in the region urbanization has been moving ahead with almost uninterrupted momentum.

As with levels of urbanization, so, too, the tempo of urbanization within Southeast Asia has varied considerably. The data in the second panel of

TABLE 5

Urban and Rural Population Distribution, Southeast Asian Countries, 1950, 1975, and 2000

Country	Urban Population (in 1000s)			Rural Population (in 1000s)			Percent Urban		
	1950	1975	2000	1950	1975	2000	1950	1975	2000
Brunei	20	88	161	26	59	55	43.5	59.9	74.5
Burma	2,188	6,978	20,264	16,192	24,262	34,638	11.9	22.3	36.9
Indonesia	8,885	26,232	74,680	66,564	109,812	162,827	11.8	19.3	31.4
Khmer Republic	364	1,828	6,327	3,799	6,282	9,492	8.7	22.5	40.0
Laos	111	369	1,161	1,838	2,934	4,564	5.7	11.2	20.3
Malaysia	1,238	3,651	9,943	4,949	8,442	12,111	20.0	30.2	45.1
Philippines	5,511	15,977	45,587	15,477	28,460	44,120	26.3	36.0	50.8
Singapore	484	2,027	3,029	538	221	97	47.4	90.2	96.9
Thailand	2,052	6,963	23,424	17,958	35,130	62,194	10.3	16.5	27.4
Vietnam	2,327	7,381	22,301	22,273	36,070	53,501	9.5	17.0	29.4
Southeast Asia	23,220	71,567	207,076	150,008	252,269	384,546	13.4	22.1	35.0
World Total	714,681	1,557,685	3,103,214	1,786,562	2,409,320	3,149,921	28.6	39.3	49.6
More Developed Regions	457,339	782,582	1,106,942	399,966	349,133	253,615	53.4	69.2	81.4
Less Developed Regions	257,342	775,103	1,996,272	1,386,596	2,060,187	2,896,307	15.6	27.3	40.8

Source: United Nations Population Division, *Trends in Urban and Rural Population: 1950–2000, as Assessed in 1973–1974*, New York: United Nations, 1975.

Table 6 show changes in the urban-rural ratio, ranging from Singapore's exceptionally high rate to a low of 57.6 percent for the Philippines. It is also noticeable that the pace of urbanization in the last quarter of the century will continue to show a wide range in tempo, although less so than in the third quarter. Furthermore, the four countries with the highest rates of urbanization during 1950–1975 will be characterized by lower rates during 1975–2000, whereas all the remaining countries of the region, all of which had rates of change below 100 in the 1950–75 period, are projected to experience faster rates of urbanization in the last quarter of the century.

Full assessment of the dynamics underlying these rates of urbanization also requires attention to the separate rates of growth of the urban and the rural population and to the role of migration in the urbanization process. Comparison of the urban and rural population growth rates (Table 6) documents that the urban populations grew at a much higher rate than did the rural in all countries, although varying over a considerable range. But the larger population on which the rural rates are based must be kept in mind because they are indicative of the large absolute rise in the rural population, even though the rural rate of growth is lower than the urban. For example, between 1975 and 2000 Thailand's urban growth of 16.5 million persons will be equivalent to a growth rate of 202 percent; during the same period the rural population will grow by only 77 percent, but this will result in an increase of 27 million persons. In short the continuing high rates of urbanization and the high rates of urban growth should not be misleading; the problems associated with growing numbers of rural people are not a thing of the past.

In order to assess the impact of migration on urban growth in each of the Southeast Asian countries and to evaluate whether its contribution has changed over time, a new set of estimates has been prepared for this analysis for the periods 1950–1960 and 1970–1975. These migration estimates have relied on the national growth rate method (Shryock and Siegel 1971, p. 625). This is a crude but fairly commonly used method. It yields an estimate of the rate of internal migration for each subdivision, in this case the urban and the rural population of the respective countries, on the assumption that rates of natural increase and of net immigration from abroad are the same for all parts of the country. The fact that urban-rural differentials and rates of natural increase are overlooked attributes to the crudeness of the measure. However, as the United Nations data for 1960 indicated, the rates of natural increase in the urban and rural populations of Southeast Asia were quite similar at that time, 26.0 and 25.6 respectively, reflecting the fact that birthrates have remained quite high in urban places although somewhat lower than the rural rates, and that death rates had come down relatively more than birthrates in urban places. The absence of a comprehensive and accurate set of urban and rural rates for individual countries precludes using a more refined method. It means, however, that the national growth rate method does, in a number of instances, probably underestimate the role of migration since,

TABLE 6

Urban-Rural Population Ratios, Percent Change in Ratios, and Rates of Urban and Rural Population Growth, Southeast Asian Countries, 1950, 1975, and 2000

Country	Urban-Rural Ratio			Percent Change in Urban-Rural Ratio		Percent Growth in Urban Population		Percent Growth in Rural Population	
	1950	1975	2000	1950–1975	1975–2000	1950–1975	1975–2000	1950–1975	1975–2000
Brunei	0.769	1.491	2.928	93.9	96.4	340.0	83.0	126.0	-6.8
Burma	0.135	0.288	0.585	113.3	103.1	218.9	190.4	49.8	42.8
Indonesia	0.133	0.239	0.459	79.7	92.0	195.2	184.7	65.0	48.3
Khmer Republic	0.096	0.291	0.667	203.1	129.2	402.2	246.1	65.4	51.1
Laos	0.060	0.126	0.254	110.0	101.6	232.4	214.6	59.6	55.6
Malaysia	0.250	0.432	0.821	72.8	90.0	194.9	172.3	70.6	43.5
Philippines	0.356	0.561	1.033	57.6	84.1	189.9	185.3	83.9	55.0
Singapore	0.899	9.172	31.227	920.2	240.5	318.8	49.4	-58.9	-56.1
Thailand	0.114	0.198	0.377	73.7	90.4	239.3	236.4	95.6	77.0
Vietnam	0.104	0.205	0.417	97.1	162.0	217.2	202.1	61.9	48.3
Southeast Asia	0.155	0.284	0.538	83.2	89.4	208.2	189.3	68.2	52.4
World Total	0.400	0.647	0.985	61.8	50.2	118.0	99.2	34.9	30.7
More Developed Regions	1.143	2.242	4.365	96.2	94.7	71.1	41.4	-12.7	-27.4
Less Developed Regions	0.186	0.376	0.689	102.2	83.2	201.2	157.5	48.6	40.6

Source: Based on data in Table 5.

TABLE 7

Average Annual Net Urban and Rural Migration[a] Rate and Percent of Urban Growth Attributable to Migration, Southeast Asia, 1950–1960 and 1970–1975

Country	1950–1960			1970–1975		
	Average Annual Migration Rate[b]		Percent of Urban Growth Due to Migration	Average Annual Migration Rate[b]		Percent of Urban Growth Due to Migration
	Urban	Rural		Urban	Rural	
Brunei	-10.6	8.2	—	13.6	-17.6	39.2
Burma	52.6	-7.0	71.4	27.8	-6.8	52.5
Indonesia	29.7	-3.9	56.5	23.9	-5.1	46.2
Khmer Republic	21.7	-2.1	42.9	39.3	-9.4	56.9
Laos	38.1	-2.3	63.2	30.6	-3.3	57.1
Malaysia	37.7	-9.4	57.5	19.9	-7.7	39.0
Philippines	19.2	-6.9	38.1	16.5	-8.3	31.2
Singapore	74.2	-66.8	55.3	9.8	-61.6	37.0
Thailand	32.0	-3.6	50.0	24.5	-4.3	40.8
Vietnam	43.1	-4.5	65.4	28.2	-5.0	56.0
Southeast Asia	33.5	-5.2	57.0	23.4	-5.9	44.7
World Total	24.0	-9.6	58.8	14.6	-8.7	47.5
More Developed Regions	14.4	-16.4	50.9	9.3	-18.2	51.4
Less Developed Regions	41.2	-7.6	64.9	20.6	-6.9	45.7

[a] Includes net changes resulting from annexation and reclassification.

[b] Per 1,000 initial population.

Source: Based on data in Table 5, using National Growth Rate method to estimate migration.

if there is any difference between the national and the urban rates of natural increase, that of the urban places is likely to be lower than that of the national. However, the fact that migrants are concentrated in the reproductive ages does mean that at least part and probably a significant part of the natural population growth occurring in cities is attributable to migrants (Weller, Macisco, and Martine 1971, pp. 225–232).

These estimates indicate that during 1950–1960, migration resulted, on the average, in the annual movement of 33.5 persons per thousand to urban places of Southeast Asia (Table 7). However, this rate of migration varied from a high of 74 per thousand for Singapore to a low of only 19 per thousand in the Philippines and to an actual exodus, for reasons not evident from available information, in Brunei. By 1970–75, the rate of net urban population transfer for the region as a whole had declined by 30 percent to 23.4 per 1000. But, it must be stressed that this does not reflect a decline in the actual number of rural-to-urban migrants. In the 1950–60 decade, the average annual number of net urban migrants was 778 thousand, whereas in the 1970–75 period the average number was 1.3 million. The reduction in rate

reflects the tremendous growth of the urban population in the intervening period; as a result, the base on which the rates were computed was so much larger in the second period than the first that the rates of in-migration were lower despite the larger absolute number of migrants. Each of the countries within the region, with the exception of the Khmer Republic and Brunei, experienced declines, although the rate of decline varied considerably.

The percentage of total urban growth attributable to migration was also lower in 1970–75 than in 1950–60 having declined from 57 to 47 percent of total growth. The populations of urban places had grown considerably by 1970–75, including the addition of large numbers of persons in the reproductive years who subsequently contributed to urban population growth through fertility. As a result, migration became less important in accounting for total urban growth. This was true for every country of Southeast Asia, except the Khmer Republic, and in some countries the reduction was considerable. This general decline in the relative importance of migration to urban growth emphasizes the earlier observation that efforts to control urban growth will have to give due weight to the role of natural increase and not focus exclusively on migration.

As suggested, the levels and rates of urbanization in particular countries are affected by a host of factors, the particular combination of which may well be unique to each country. Because of the relatively small number of countries constituting the Southeast Asia region, any attempt to identify, through statistical analysis, causes and/or consequences of urbanization are necessarily restricted, especially given the quality of the data. Yet some attention to interrelations between the level and the rate of urbanization and of migration, as well as to the relation between these factors and selected indicators of development seems desirable for the insights it may provide. It must be emphasized, however, that the present attempt represents only a crude and preliminary effort at gaining such insights. To carry out the analysis, each of the countries of the region, excluding Singapore because of its unique character, has been ranked in terms of the variables listed in Table 8, and the rank correlations between the particular variables has been ascertained.

The available evidence does not suggest a strong relation between level of urbanization and rate of urbanization. Although there is some tendency for the more urbanized countries of Southeast Asia to experience a lower rate of urbanization, the correlation (−.150) is very low. The relation between level of urbanization and rate of migration to urban places is much higher (−.729), suggesting that the attraction of Southeast Asian migrants to urban places varies strongly and inversely with level of urbanization. This would be consistent with the earlier observation that the rates of migration to urban places generally declined as the levels of urbanization rose, even while the absolute number of migrants increased.

All of the countries of Southeast Asia, with the possible exception of Singapore, qualify as less developed. Nonetheless, their levels of development,

TABLE 8

Selected Indicators of Urbanization and Social and Economic Development, Southeast Asia

Country	Percent Urban 1970[a]	Average Rate of Urbanization 1970–75[a]	Average Annual Urban Migration Rate 1970–75[a]	Gross National Product (per capita) 1971[b]	Annual Growth of Gross Domestic Product (per capita) 1968–73[b]	Agricultural Density per Km² 1965[c]	Annual Rate of Population Growth 1970–75[a]	Energy Per Capita in Kil. 1965[c]
Brunei	56.4	3.1	13.6	$1,370	3.4	—	1.9	—
Burma	19.9	3.2	27.8	80	2.0	162	2.4	47
Indonesia	17.5	2.7	23.9	80	4.2	595	2.6	111
Khmer Republic	19.3	4.5	39.3	130	−6.7	205	2.8	45
Laos	9.8	3.1	30.6	120	3.5	125	2.2	43
Malaysia	27.8	2.4	19.9	400	3.4	167	2.9	357
Philippines	33.6	2.2	16.5	240	3.1	289	3.3	209
Singapore	86.3	9.2	9.8	1,200	8.9	18,650	1.6	578
Thailand	15.0	2.5	24.5	210	2.2	289	3.3	110
Vietnam	15.1	3.2	28.2	160	2.7	632	2.1	—
				Rank Correlation Among Variables				
Percent Urban	—	−.150	−.729	+.567	−.033	+.137	+.079	+.572
Rate of Urbanization	−.150	—	+.663	−.296	−.250	−.420	−.588	−.866

Source: [a] Based on data in United Nations Population Division, *Trends and Prospects in Urban and Rural Population: 1950–2000, as Assessed in 1973–1974*, New York: United Nations, 1975.

[b] United Nations Economic and Social Council, *1974 Report on the World Social Situation*, Part One, January 1975, Table 2 (Mimeographed).

[c] C. L. Taylor and M. C. Hudson, *World Handbook of Political and Social Indicators*, 2nd Edition, New Haven: Yale University Press, 1972.

judged by various indices, differ. To assess on an exploratory level the relation between urbanization and development, several indicators are used here: gross national product per capita; average annual growth of gross domestic products (GDP); agricultural density; population growth; and energy per capita. Of these five indicators, only gross national product per capita and energy per capita show any substantial relation to level of urbanization (.567 and .572, respectively). Although these relations are in the expected direction, they are not particularly high; moreover, the still lower correlations between three other development indicators and the level of urbanization certainly raises some questions about the true extent to which level of development and urbanization are related in Southeast Asia. Further insights may be gained through examination of the relation of the same variables to the rate of urbanization.

As would be expected, the rate of urbanization and the rate of migration to urban places are highly correlated in a positive direction (.663). The relation of the rate of urbanization to all other indicators listed in Table 8 is negative, although the level of the relationship varies considerably. The relation of the rate of urbanization to both population growth (—.588) and to agricultural density (—.420) is stronger than that characterizing the relation between these two variables and level of urbanization, and opposite in direction. The negative relation suggests that, for Southeast Asia at least, higher population growth rates are not clearly associated with a push to urban places that results in high rates of urbanization. Rather, to the extent that urbanization is occurring at a rapid pace, it seems to be related inversely to the rate of population growth, suggesting that high urbanization and slower total growth rates may both be a function of the same underlying processes. The negative relation between agricultural density and rate of urbanization, although low, may suggest that the greater the ability of agriculture to absorb and retain population, the slower the pace of urbanization, but this certainly requires more intensive evaluation that includes better indicators of pressure on the land. The low and negative correlation between rate of urbanization and gross national product per capita (—.296) suggests that whereas level of urbanization tends to be more strongly and positively related with development level as indexed by GNP, it is more weakly and inversely related to the pace of urbanization. Since the contribution of agricultural production to the national product is an important major factor in most of the countries of Southeast Asia (Taylor and Hudson 1972, pp. 338–340), this negative relation may be more indicative of the conditions in rural areas and the attractiveness of the cities to rural-to-urban migrants. The high negative correlation between rate of urbanization and energy per capita also raises doubts about the extent to which the pace of urbanization reflects level of development.

Overall, these data lend support to the observation that the process of urbanization seems to have a momentum of its own, or at least one which is not very clearly tied to particular levels of development or to particular rates

of total population growth or existing levels of urbanization (United Nations Population Division 1975, p. 5). One observation that seems to emerge clearly from these data is that within the Southeast Asia region, patterns of urbanization in particular countries show considerable variation; this, in turn, suggests that full assessment of the causes and the consequences of urbanization requires indepth study of the experience of each country. It also implies that the development of particular policies to cope with problems associated with the urbanization process must be tailored to meet the unique combination of historical and current conditions in individual countries rather than be prescribed on a uniform basis for the region as a whole.

Urbanization and Social and Economic Development

Overall, the generalization, based largely on the experience of Western countries, that urbanization favors development may not be wholly applicable to much of recent and future urbanization in Southeast Asia. Available evidence suggests that a considerable portion of urban growth results not from economic opportunities afforded by urban centers, but rather from conditions in rural areas and from a stagnant rural economy. Urban employment tends to be disproportionally concentrated in the traditional service sector, and many migrants to urban places find few opportunities in the still underdeveloped urban industrial and modern service sectors.

Compounding the exodus from rural areas, which is associated with increased pressure on the land, are the lack of non-agricultural occupations to absorb the surplus rural labor and the stagnation of handicraft industries. But often the decision to leave rural areas may be more a function of the individual's perception of the comparative rural and urban situations rather than of the real opportunities (Speare 1971; Todaro 1969). The high levels of turnover and return migration suggest that the real situation is quite different from the perceived one and that the failure to achieve in the short run the goals which motivated migration often leads to a return to the rural place or movement to another urban place. Turnover migration thus probably operates as a mechanism for relieving some of the demographic pressure on the urban environment.

Despite the emphasis on rural out-migration as a factor in urbanization, it is also important to recognize that the large majority of rural persons in Southeast Asia have never migrated. This suggests that either because of lack of communication or because of lack of response to stimuli, the question of moving to urban places has either not yet arisen, or, if it has, the response has been negative. If there should be a change in the situation in rural areas such that even an additional small proportion of the very large rural population is induced to move, it could have very significant implications for the rates of urban growth and for urban problems. For example, a rise of only 1 per 1,000 in the rate of rural exodus in Southeast Asia from its current level of 3.7 could mean the movement of an additional 300 thousand persons to cities each year

by 1985.

Because the rapidly increasing rural population provides a large reservoir of migrants for the city, and because the cities are already encountering enormous problems as the result of rapid growth from both in-migration and natural increase, rural development is essential to avoid the complete asphyxiation of urban centers. The potential associated with the Green Revolution has been cited as one hopeful step in this regard. To the extent that the major increases in yields resulting from new varieties and multiple cropping are not dependent on large-scale substitution of capital for labor, the possibility that rural changes may provide new opportunities for absorbing the increase in the labor force is often viewed optimistically (Singh and Day 1975, pp. 670–686). But it is important to emphasize that the estimated increases of 20 to 50 percent in rural labor needs as well as increased employment opportunities in small urban centers responsible for the increased marketing and processing activities generally associated with the Green Revolution depend on a number of other developments, including improved irrigation, basic changes in social and economic structure, and the generation of new markets for the additional yield. Given the magnitude of the changes required, the contribution which agrarian reform may make to relieving rural pressures and decreasing rural to urban migration must therefore remain highly speculative (Shaw 1970). Moreover, the advantages gained may be short term in character, and more than cancelled by other changes, including possibly widening gaps in income distribution (United Nations Economic and Social Council 1974b, p. 23).

As the United Nations itself has pointed out, "Modernization in agriculture implies, sooner or later, an irreversible decline in the need for rural manpower. Mechanization, irrigation, and double or triple cropping will only temporarily increase agricultural employment. As productivity rises and mechanization increases, the need for rural labor must decrease. Developing countries cannot hope to modernize without a steady decline in the proportion of the working population engaged in food production" (Taeuber 1971, p. 20; see also Singh and Day 1975, pp. 680–686). The recent experience of Indonesia is a case in point. It has been reported that more than half of the smaller holdings in some parts of Java have already been swallowed up by larger farmers and absentee landlords as a result of the Green Revolution. Moreover, changes in methods of harvesting have reduced the number of man-hours of work by 125 million and eliminated 1.2 million rural jobs (Sterling 1975, p. 8).

The seriousness of the problem is illustrated further by the case of Thailand. Gavin Jones (1972, pp. 5–12) has estimated that even if the agricultural labor force could be lowered to approximately 50 percent of the total labor force from its present level of 80 percent, a change which would require drastic shifts to urban locations and industrial employment, this would still involve, given projected population increases, an agricultural labor

force almost two times its present size. To absorb that much shift into the urban-industrial economy while at the same time providing the very large number of jobs needed in agriculture is a tremendous challenge. Moreover, for a number of countries in Southeast Asia, the urban service sectors are already oversupplied and rural-urban migration has resulted, directly or indirectly, in inflating the number of unemployed and underemployed in big cities. This means that any strategy to absorb the growing labor force of these countries must be both labor intensive and rural based (Oshima 1973, pp. 3–4); the challenge implied in the need to absorb a large part of the manpower increases in the agricultural labor force is no less great than that faced by the urban economy.

Some have argued that migration from rural to urban places provides a relatively inexpensive way of modernizing traditional people. But this view overlooks the possibility that migration may lead instead to urbanizing rural poverty (Mitchell 1973). Although natural increase constitutes a large part of urban growth in Southeast Asia, such growth is significantly compounded by net migration. As a result, many of the problems associated with urbanization are in fact problems which are severely aggravated by rural-to-urban population movement. Overcrowding, the spread of slums and squatter settlements, difficulties of waste disposal, housing shortages, inadequate educational facilities, poor water supply, traffic congestion, and lack of open spaces for recreation are closely related to the excessive growth rates of urban places and particularly of the big cities of Southeast Asia and to the inability of these centers to cope quickly with such a multiplicity of social and economic problems. Moreover, if much of the movement to urban centers is not fully justified by the availability of jobs and underemployment or unemployment results for migrants and/or natives, their income will be inadequate, affecting both the quality of their personal lives and their ability to contribute their share to the costs of providing the basic governmental facilities.

Policies and Programs Related to Urbanization

Given the present urbanization situation and the prospects resulting from continued growth, it is surprising that most of the governments in Southeast Asia have done so little to develop and implement policies directed at alleviating the problems facing big cities. Nor has much attention been given to the role of both large and small cities in the total development process. Even when some policies are identifiable, they tend to be of a subsidiary nature and only one component in a wide ranging package of policies dealing with modernization and economic development (Pryor 1974, pp. 17–19).

Recognizing the dangers inherent in the projected sharp increases in big city population, in some countries some attention is now being given to the possibility of slowing the growth rate of these cities in order to maintain at least the present health and living levels and to keep the costs of social services within reason. The programs suggested for achieving this goal are

largely geared to encouraging other urban growth centers on the assumption that this will create both a stronger national economy and enhance the attractiveness of other cities to rural persons who might otherwise migrate to metropolitan centers. Yet, the experience of such cities as Bangkok and Manila during the last several decades does not generate great confidence that some of the ideas currently being discussed will be implemented in the immediate future (Romm 1972, pp. 120–125; and Keare 1975, p. 24). Instead, specific problems are being dealt with in an *ad hoc* fashion. Moreover, the lack of coordination among the many government agencies sharing responsibility for given problem areas has seriously impeded the development and implementation of integrated plans either for the urban sector or for the nation as a whole. As the 1974 Report on the World Social Situation put it, "within the development process, the formulation of goals, policies, plans, and programs must reflect the relationship between urbanization, social reforms, agricultural reform, transfer of technology, and comprehensive development" (United Nations Economic and Social Council 1974c, p. 6).

At the same time, it is essential to recognize that in most countries of Southeast Asia, rural development is taking place in varying degrees and forms. On the one hand, the resulting changes may lead to a variety of improvements such as better water supply, sewage and garbage disposal, and better housing. The quality of the population may also rise with improved health and better education. Economic resources may increase through better land distribution, fuller employment, and increases in available arable land. Yet, many of these programs carry with them the risk that they will introduce changes into the rural areas which will lead to increased displacement of population and possibly a greater exodus from rural to urban places (Goldstein 1971). Roads to help rural development may make it easier for the rural population to come in contact with urban places and to migrate to the big cities.

Moreover, steps taken to improve conditions in rural areas in partial expectation that they will reduce the movement to cities and thus attenuate the urban crisis may, in turn, bring new problems to the rural areas. For example, location of industry in rural areas carries with it the threat of polluting the atmosphere and upsetting the crop cycle. Unless adequate care is taken in introducing irrigation projects, soil erosion and changes in chemical composition may have a negative effect. To avoid such unwanted results, developmental planning with much greater concern for the social, economic, and ecological implications must move ahead simultaneously and in an integrated fashion for both cities and rural areas lest, in the process of trying to solve the problems of one, new problems are created for the other. And in such planning, greater recognition must be given to the important role played by migration as a mechanism through which the population attempts to adjust to changing demographic and environmental conditions.

In our overall concern with the population explosion, the entire question of rural-urban population redistribution and its relation to natural increase as a component of urban growth has suffered serious neglect. Fairly recent recognition of the importance of migration and the greater effort being made to assess the interrelations among urbanization, migration, natural increase, and environmental conditions will, hopefully, provide a sounder basis for the development of policies and programs with some likelihood of success in avoiding possible catastrophic conditions. Awareness of the magnitude of the potential problem represents the first step toward the eventual formulation of overall development goals encompassing both urban and rural segments of the economy and population and helping to insure greater equity and social justice in the distribution of the benefits of development among all groups and regions (United Nations Economic and Social Council 1974a, p. 16).

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Country Studies

designed to influence population movement should not be developed without taking into account those factors currently affecting migration and population distribution. For that reason, comprehensive study aimed at elaborating the interrelationships between population variables and socio-economic variables should be undertaken. In addition, some understanding of the optimum distribution of the population would be very desirable as a guideline for policy formulation.

MIGRATION DIFFERENTIALS: THE CASE OF KOREA, 1965–1970

*Eui-Young Yu**

One of the most visible signs of the profound social change that Korea has been undergoing during the recent past is a rapid rate of urbanization. Concomitant with an unprecedented growth of the urban industrial sector of the Korean economy, masses of the rural population have flocked into large cities. Between 1960 and 1970 the urban (administrative areas with 50,000 or more population) population grew at an average rate of 5.5 percent a year, while the rural population increased by only 0.6 percent per year. Eighty-five percent of the nation's total population growth during the decade was absorbed by cities. Thus, the proportion of the population classified as urban increased from 30 percent in 1960 to 41 percent in 1970. If administrative sub-units with populations of more than 20,000 but less than 50,000 are included in the urban category, the urban population constituted more than half of the total Korean population at the time of the 1970 census.

Seoul's growth rate was exceptionally high during this period. It grew at an average annual rate of 6.5 percent during 1960–1966 and by 9.4 percent during 1966–1970. The population of Seoul more than doubled within the decade, from 2.6 million in 1960 to 5.5 million in 1970. In 1960 Seoul's population constituted 10 percent of the nation's total population and 35 percent of the total urban population. In 1970 it comprised 18 percent of the total Korean population and 43 percent of the urban population. Seoul together with its satellite communities—Incheon, Suwon, Sungnam, Euijeongbu, Anyang, Sosa, and Sindo Myun—now constitutes almost one quarter of the nation's total population (Watson 1973).

The major component of this dramatic increase in the population of cities is net in-migration between these areas and the rest of the nation. Gains from net migration accounted for 49 percent of the total urban population increase between 1960 and 1966, and 73 percent of the increase between 1966

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and 1970. In Seoul, net migration accounted for 66 percent of the growth during 1960–1966, and 81 percent during 1966–1970 (Kwon et al. 1975).

One of the important research questions to be answered in the midst of this rapid process of urbanization is who migrates and why. Migration not only affects the social and psychological state of the migrants but also has a significant impact on places of origin and destination. It is essential to understand the nature of migration, its intensity, character, and direction in order to formulate a sound policy on population redistribution and national development. The purpose of this paper is to highlight one important aspect of migration—its selectivity—as experienced in Korea during 1965–1970.

Data for this analysis come from the 1970 Republic of Korea Population and Housing Census. The 1970 Korean census collected items on place of birth and place of residence five years ago on the basis of a 10 percent sample. These items were cross-tabulated with basic demographic, social, and economic characteristics and published in a special volume on internal migration. These data, despite the existence of the usual types of error associated with census taking in a developing nation, highlight some major features of migration selectivity in Korea.

One major limitation of the data is related to the definition of the term "urban migrant" used in the published census reports. The census uses *Shi-Gun* definition of urban and rural places.[1] Urban migrants in the census report include those (a) who moved into urban (Shi) areas from rural (Gun) areas, (b) those who moved to urban areas from other urban areas, and (c) those who moved between districts (Gu) within each of the two special cities, Seoul and Busan. Persons involved in the "c" category are practically intracity movers, moving from one area of the city to another area of the same city and should not be considered as inter-urban migrants. Nevertheless, these people are classified as inter-urban migrants in published reports of both 1966 and 1970 Korean censuses. In this study, the inter-Gu movers within the two special cities were isolated from the migrant category whenever the data allowed. An urban migrant, then, is a person living in an urban area at the time of the 1970 census but living in either another urban or rural area in 1965.

Age and Sex

It is well established that migration is selective of the young (Browning

[1] *Shi* is an administrative area with a minimum of 50,000 population. Areas covered by *Shi* are customarily designated as urban areas. In terms of the number of persons involved and industrial composition, the *Shi* can be safely viewed as an urban area. *Eup* is an area with a population of more than 20,000 but less than 50,000. The *Eup* is generally viewed as an area standing somewhere in the middle of the rural and urban continuum in terms of the population size and other characteristics. Most *Eups* have some urban characteristics and landscape and often have the function of local rural centers, even though a large portion of the *Eup* population generally engage in farm activities.

TABLE 1

Percentage Distribution of Five Year Migrants by Age Group, Sex, and Migration Stream, 1965–1970, Korea

Age Group	Rural-to-Urban			Urban-to-Rural			Rural-to-Rural			Urban-to-Urban		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
5–9	11.87	9.62	10.71	11.20	11.42	11.31	14.54	12.68	13.58	10.59	10.03	10.31
10–14	12.41	11.25	11.82	7.91	8.21	8.05	11.41	10.07	10.75	9.08	1.89	9.51
15–19	19.74	21.76	20.78	7.05	8.54	7.77	9.33	9.99	9.67	12.00	14.25	13.10
20–24	12.53	18.31	15.50	18.38	19.80	19.07	10.10	18.92	14.63	19.33	18.66	19.00
25–29	14.16	13.30	13.72	16.59	18.18	17.37	14.31	16.24	15.30	15.25	16.25	15.74
30–34	11.96	8.11	9.98	14.15	11.51	12.87	13.96	10.02	11.94	13.28	10.56	11.95
35–39	7.00	5.04	5.89	8.84	6.54	7.72	9.28	6.15	7.67	8.18	6.49	7.35
40–44	3.77	3.14	3.44	4.74	4.11	4.43	5.16	3.95	4.54	4.72	3.79	4.26
45–49	2.34	2.28	2.31	3.81	3.16	3.49	4.02	3.08	3.54	3.09	2.78	2.93
50–54	1.50	1.89	1.70	2.65	2.32	2.49	2.66	2.31	2.88	1.71	2.00	1.85
55–59	1.04	1.69	1.38	2.00	2.08	2.04	2.08	2.02	2.08	1.12	1.85	1.48
60–64	.74	1.55	1.16	1.37	1.60	1.48	1.41	1.47	1.44	.80	1.38	1.09
65–69	.38	.92	.66	.72	1.01	.86	.76	1.29	1.03	.38	.96	.67
70+	.47	1.05	.77	.53	1.46	.98	.89	1.75	1.33	.34	1.04	.18
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
(No. in 1000s)	895	949	1,844	194	184	378	320	338	658	392	378	769

Source: Economic Planning Board, *1970 Population and Housing Census Report*, Vol. 2, Ten Percent Sample Survey, Internal Migration, Seoul: Economic Planning Board, 1973, Table 4.

TABLE 2

Percentage Distribution of Five Year In-Migrants to Seoul and Busan by Age Group, Sex, and Area of Origin, 1965–1970

Age Group	In-Migrants to Seoul						In-Migrants to Busan					
	From Rural Areas			From Urban Areas			From Rural Areas			From Urban Areas		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
5-9	11.21	8.25	9.80	11.40	9.21	10.26	12.15	9.84	10.98	11.49	10.64	11.05
10-14	10.84	10.65	10.74	10.56	10.37	10.46	9.62	10.15	9.89	9.56	9.73	9.64
15-19	19.42	24.03	21.86	15.16	16.95	16.09	17.55	20.11	18.80	12.37	13.16	12.77
20-24	14.44	19.16	16.94	14.60	18.59	16.67	12.84	19.40	16.17	11.91	17.86	14.95
25-29	15.33	12.84	14.02	14.18	14.14	14.16	16.85	15.22	16.02	16.85	18.12	17.50
30-34	11.63	7.60	9.50	12.65	9.48	11.00	14.53	8.69	11.57	16.52	10.83	13.41
35-39	6.81	4.67	5.68	8.13	6.29	7.18	7.22	4.89	6.04	9.17	6.43	7.77
40-44	3.78	2.94	3.33	4.92	3.85	4.36	3.19	3.06	3.12	5.50	3.91	4.68
45-49	2.36	2.28	2.32	3.38	2.97	3.17	2.25	2.31	2.28	3.03	2.51	2.76
50-54	1.49	2.07	1.80	1.90	2.19	2.05	1.33	1.75	1.54	1.51	1.75	1.63
55-59	1.11	1.85	1.50	1.25	2.14	1.71	.90	1.37	1.14	.95	1.92	1.45
60-64	.78	1.54	1.18	.93	1.57	1.26	.64	1.44	1.05	.95	1.25	1.10
65-69	.37	.83	.61	.49	1.07	.80	.37	.79	.58	.28	.89	.59
70+	.36	.91	.65	.38	1.10	.75	.49	1.01	.75	.25	.95	.61
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
(No. in 1000s)	388	434	822	177	192	369	105	109	214	46	49	95

Source: Same as Table 1.

TABLE 3

Percentage Distribution of Population by Age Group and Sex, All Shi, All Gun, and Seoul, 1970

Age Group	All Shi[a]			All Gun			Seoul		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
5–9	14.56	13.41	13.98	19.31	17.99	18.64	13.73	12.49	13.11
10–14	15.33	14.39	14.86	17.81	16.48	17.15	14.08	13.56	13.82
15–19	14.02	14.03	14.03	9.88	9.11	9.50	13.53	14.45	13.99
20–24	11.05	11.88	11.47	8.53	6.98	7.71	11.94	13.02	12.48
25–29	10.11	10.13	10.12	6.65	6.75	6.70	11.30	10.98	11.14
30–34	1.54	8.73	9.13	7.21	7.46	7.34	10.28	9.08	9.68
35–39	7.20	6.92	7.06	6.43	6.91	6.67	7.44	6.88	7.16
40–44	5.23	5.41	5.32	5.00	5.86	5.43	5.25	5.17	5.21
45–49	4.41	4.27	4.34	4.80	5.23	5.01	4.38	4.05	4.21
50–54	3.16	3.09	3.12	4.14	4.33	4.24	3.13	3.02	3.07
55–59	2.26	2.55	2.41	3.53	3.82	3.68	2.17	2.51	2.34
60–64	1.50	1.98	1.74	2.74	3.16	2.95	1.41	1.91	1.66
65–69	.78	1.32	1.05	1.73	2.25	1.99	.69	1.24	.97
70+	.77	1.83	1.30	2.58	3.59	2.89	.61	1.57	1.09
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
(No. in 1000s)	5,633	5,646	11,279	7,918	7,922	15,840	2,409	2,434	4,843

[a]Seoul and Busan included.

Source: Economic Planning Board, *1970 Population and Housing Census Report*, Vol. 1, Complete Enumeration, Seoul: Economic Planning Board, 1973, Table 2.

1971). Korea is no exception in this respect. Tables 1, 2, and 3 compare percentage distributions of the five year migrants in the major migration streams with those of the resident population in the areas of destination by age group and sex. Migration is selective of the late teens and young adults for every major stream. Young people prevail in movements between rural and urban areas, between cities, and between rural and other rural areas. Young people are in general better prepared for and willing to adapt to new environments and it is natural to observe the excess of young people among migrants to all destinations.

Among the various migration streams, the rural-to-urban migration stream (especially that moving toward the nation's capital) tends to be selective of the youngest people. The late teens, 15–19, constituted 22 percent of the rural-to-Seoul migrants, 21 percent of the rural-to-urban migrants, 14 percent of the urban-to-urban migrants, 10 percent of the rural-to-rural migrants, and 8 percent of the urban-to-rural migrants. In other words, migrants in the dominant stream, namely those moving towards cities, are much younger than those in the reverse stream moving towards rural areas.

Compared with the general population in the areas of destination, however, all streams are selective of the young. Fifty percent of the 1,844,000 urban migrants originating in rural areas and 48 percent of the 769,000 inter-urban migrants were between 15–29, while only 36 percent of the urban population five years of age and over are in these ages. We find 22 percent of the rural

TABLE 4
Sex Ratios of Five Year Migrants by Age Group and Migration Stream, 1965–1970

Age Group	Rural-to-Urban	Urban-to-Rural	Rural-to-Rural	Urban-to-Urban	All Urban	All Rural
5– 9	116.35	105.71	108.59	109.55	108.36	107.21
10–14	103.96	101.95	107.30	96.08	106.36	107.99
15–19	85.54	87.41	88.43	87.39	99.69	108.40
20–24	64.51	98.24	50.57	107.51	92.75	122.13
25–29	100.37	96.59	83.50	97.36	99.61	98.40
30–34	139.02	130.06	132.02	130.51	109.05	96.58
35–39	130.82	142.98	143.02	130.82	103.77	92.91
40–44	113.11	122.11	123.66	129.14	96.38	85.22
45–49	96.80	127.57	123.76	115.35	103.09	91.73
50–54	74.76	120.88	109.27	88.79	102.11	95.59
55–59	58.14	101.80	97.50	62.51	88.46	92.47
60–64	45.02	91.06	90.94	59.83	75.75	86.69
65–69	39.73	75.20	56.36	41.18	59.23	76.83
70+	42.22	38.62	48.50	33.67	41.98	60.86
Total	94.27	105.84	94.72	103.77	99.75	99.95

Source: Same as Table 1.

population five years of age and over in ages between 20–34 in 1970. In contrast, 49 percent of the 378,000 rural migrants originating from cities and 42 percent of the 658,000 rural-to-rural migrants between 1965 and 1970 were in the same age bracket.

Age selectivity of urban migation varies greatly depending upon the areas of origin. Migrants tend to be younger if they are from rural areas. In Seoul, migrants in the peak age group of 15–19 constituted 22 percent of those originating from rural areas and 16 percent of those originating from other cities. In Busan, the second largest city, migrants in the 15–19 age group constituted 19 percent of those from rural areas and 13 percent of those coming from other cities. In all urban areas, 21 percent of all migrants from rural areas were concentrated in the 15–19 age bracket, while 13 percent of those who moved from other urban areas were found in the same age category. Jobs and conditions of city life favor both the physical vitality and the mental agility of youth.

Women predominate in movements originating from rural areas, while men predominate in movements originating from urban areas. As shown in Table 4, sex ratios for migrants are 94 for rural-to-urban stream, 95 for rural-to-rural stream, 106 for urban-to-rural stream, and 104 for urban-to-urban stream. Female migrants between 15 and 24 outnumber men in all other migration streams except the 20–24 age cohort of the inter-city migrants. High school and college graduates in regional cities entering the job market in larger cities or vice versa appear to have created a preponderance of males among inter-city migrants in this particular age group.

The most notable sex imbalance in favor of females is observed among

the 15–24 age groups of the rural-to-urban and rural-to-rural migration streams. The overwhelming dominance of females in these ages among the rural-to-urban migration stream appears to be related to the urban job structure which favors young females. Women in these ages are primary sources of labor supply for jobs abundant in the city such as those of housemaid, bar girl, waitress, errand girl, and factory worker in textile and electronic assembly plants.

The predominance of females in their late teens and early twenties in movements between different rural areas is primarily due to marriage related moves. Most Korean women marry during this age interval and it is the bride who customarily moves to the place of the bridegroom when marriage occurs.

Between ages 30–44, male migrants far exceed females in all migration streams. These are prime child rearing ages for Korean women. While men are relatively free to leave for cities leaving their families behind, child rearing responsibilities appear to hamper the mobility of women in these ages.

Female selectivity again stands out among migrants toward urban areas after age 50. This is largely due to those migrants who seek urban employment such as domestic work or street vending after their children have grown, or those who, after surviving their husbands' death, move to cities to join their children who have previously migrated. It is a common practice in Korea for children to support their parents after retirement.

Table 5 presents sex ratios of in-migrants to Seoul and Busan by age group

TABLE 5
Sex Ratios of In-Migrants to Seoul and Busan by Age Group and Area of Origin, 1965–1970

Age Group	In-Migrants to Seoul		In-Migrants to Busan		All Seoul
	From Rural Areas	From Urban Areas	From Rural Areas	From Urban Areas	
5– 9	117.27	114.45	119.76	103.23	108.81
10–14	91.05	94.09	91.90	93.96	102.75
15–19	72.28	82.68	85.07	89.91	92.66
20–24	67.42	72.60	78.47	63.75	90.75
25–29	106.76	92.72	107.34	88.94	101.85
30–34	136.82	123.36	162.03	142.30	112.12
35–39	130.41	119.49	143.28	136.33	107.15
40–44	114.82	118.15	100.83	134.45	100.66
45–49	92.62	105.33	94.28	115.32	106.97
50–54	64.27	79.98	73.75	82.82	102.63
55–59	53.69	54.07	63.77	47.43	85.75
60–64	45.29	55.04	43.74	72.62	72.96
65–69	40.10	42.34	46.23	30.09	55.48
70+	35.97	32.19	47.27	24.94	38.40
Total	89.23	92.45	96.99	95.58	98.98

Source: Same as Table 1.

and area of origin. Seoul attracts relatively more females than Busan. Among in-migrants to Seoul, females predominate in all streams. Females are more predominant among migrants originating from rural areas than those originating from other cities. In contrast, Busan appears to draw relatively more females from other cities than from rural areas, even though the difference is not great. Overall female selectivity among in-migrants is less obvious in Busan than in Seoul. In both cities, however, female migrants greatly outnumber men in age groups between 10–24 and in the post reproductive age groups, and males outnumber females in the prime child rearing ages between 30–44 for the reasons stated above.

Education

Migrants to cities, especially those moving toward Seoul, are comparatively well educated. The 1970 Korean census reveals that 97 percent of the Korean population between ages 15–24 have had at least six years of formal education. A survey conducted by Seoul Special City shows that more than 90 percent of the in-migrants to Seoul during January-June 1969 between ages 15–39 had completed at least six years of formal schooling. Another survey indicates that only 9 percent of those between ages 15–19 who migrated into Seoul during 1968 had no formal schooling (Yoon 1970).

Table 6 presents education levels of population by age group for the whole country, for Seoul, and for in-migrants to Seoul. Among those between ages 25–39, the prime ages of economic activity, in-migrants to Seoul have about the same or a slightly higher educational level, as measured by the percent who completed middle school, high school, or college, as that of the corresponding population of Seoul. On the other hand, the educational level of in-migrants to Seoul is much higher than that of the total Korean population except for those in very young ages. Thirteen percent of the in-migrants between ages 25–29 and 17 percent of those between 30–34 who arrived in Seoul during January-June 1969 had completed at least four years of college education. The corresponding figures for the general population of Seoul in 1970 are 13 percent and 15 percent each.

For persons under age 25, migrants to Seoul tend to be lower in educational level than both non-migrant residents of Seoul and the national population. These young migrants may have had their formal schooling interrupted by moving and the adjustment stages of migration. It will be interesting to see how many of them resume their education and how many remain permanently in the work force after the initial settlement period in Seoul. Unfortunately, available data do not permit such analysis at this time.

Educational levels of migrants to Seoul over age 40 tend to be lower than those of the general population in the city but significantly higher than those of the nation for the corresponding age categories. Unlike the young migrants, who can freely attempt to build a new life in an urban setting, older people are less likely to move to the unfamiliar environment of big cities

TABLE 6
Percent of Population Who Completed at Least Middle School, High School, or College by Age Group, Whole Country, Seoul, and In-migrants to Seoul

Age Group	Percent of population who completed at least:									
	Middle school[a]			High School[b]			College			
	Whole country[c]	Seoul[c]	In-migrants[d]	Whole country[c]	Seoul[c]	In-migrants[d]	Whole country[c]	Seoul[c]	In-migrants[d]
10–14	0.25	0.50	0.59	–	–	–	–	–	–
15–19	41.47	55.11	25.71	6.46	10.89	4.02	–	–	–
20–24	55.52	72.27	52.94	32.70	48.36	25.67	2.01	4.27	1.07
25–29	47.71	69.70	71.83	27.66	46.43	45.07	5.81	13.12	13.38
30–34	39.75	64.80	69.88	23.81	43.44	54.83	6.10	15.06	17.20
35–39	32.53	60.52	72.72	19.55	40.27	36.36	5.24	13.81	7.79
40–44	24.11	53.31	37.50	13.02	33.08	20.00	3.50	11.15	5.00
45–49	17.55	45.50	54.06	8.68	25.88	10.82	2.13	7.70	5.41
50+	7.26	26.43	14.89	3.30	13.68	10.64	0.71	3.35	4.25

[a] Middle school is from 7th grade to 9th grade. [b] High school is from 10th grade to 12th grade.
[c] As of October 1, 1970. [d] Who arrived in Seoul between January and June, 1969.
Sources: Economic Planning Board, *1970 Population and Housing Census Report*, Vol. 1, Complete Enumeration, Seoul: Economic Planning Board, 1973, Table 4, and Vol. 1, Complete Enumeration, City of Seoul, Table 4. Seoul Special City, *Seoul Statistical Yearbook 1970*, Seoul: Seoul Special City, 1971, Table 27.

unless they possess something to rely on, such as education or skills, for they most likely have dependents to care for.

Educational attainment of migrants also varies greatly among the various migration streams. Table 7 shows educational levels of five-year migrants by migration type and sex. In general, as in the case of the total population, female migrants are substantially less well-educated than males in all migration categories. The great contrast is shown between educational levels of Seoul in-migrants originating from other cities and those originating from rural areas. Twenty-four percent of male migrants and eight percent of female migrants to Seoul from other urban areas have had at least some college education compared with nine percent and two percent among those originating in rural areas. Nevertheless, rural migrants to Seoul are better educated than those rural migrants moving to other cities.

Busan also draws relatively well educated migrants, even though the selectivity is less strong than Seoul's for both male and female migrants and for those originating in both urban and rural areas. As was observed in Seoul, migrants to Busan originating from cities showed a much higher education level than those originating from rural areas.

Compared with the educational level of migrants in the dominant rural-to-urban migration stream, those moving in the reverse direction from urban-to-rural areas show a much higher level of educational achievement. Eighteen percent of males and five percent of females among the urban-to-rural migration stream have had at least some college education, whereas among the main stream of rural-to-urban migration, only eight percent of males and two percent of females have had some college education.

The positive selectivity of education among urban-to-rural migrants may be accounted for to a considerable extent by those moving to suburban areas and toward peripheral *Myun* and *Eup* areas of the largest size cities. Presumably, however, there is a significant number of well educated people, such as teachers, engineers, skilled workers, and innovative farmers, heading

TABLE 7
Percent of Five-year Migrants Who Have Had at Least Some College Education by Migration Stream and Sex, 1965–1970

Migration Stream	Percent who have had some college education	
	Male	Female
Urban to Seoul	23.8	8.4
Rural to Seoul	9.0	1.7
Urban to Busan	18.9	4.4
Rural to Busan	5.7	0.7
Urban[a] to Rural	17.7	4.7
Rural to Urban[a]	7.8	1.4

[a]Includes both Seoul and Busan.

Source: Economic Planning Board, *1970 Population and Housing Census Report*, Vol. 2, Ten Percent Sample Survey, Internal Migration , Seoul: Economic Planning Board, 1973, Table 6.

back toward regional industrial towns and farm villages among the urban-to-rural migration stream.

Labor Force Participation

Migrants are in general more economically active than non-migrant residents in the areas of destination, as demonstrated in Table 8. For both males and females, migrants are more economically active than residents in cities. While the male labor force participation rate is higher among the urban-to-urban migration stream than among the rural-to-urban migration stream, females show a higher labor force participation rate among the rural-to-urban migration stream than among the urban-to-urban migration stream. It appears that economic motives are predominant among male migrants moving from one city to another and among female migrants moving from rural areas to cities. For male migrants moving from rural areas to cities and female migrants moving between cities, non-economically related motives such as education and marriage (especially for females) seem to play a relatively more important role.

Male migrants moving toward rural areas are more economically active than their resident counterparts in both areas of origin and destination. In fact, these migrants show the highest labor force participation rates among all migration streams. Economic motives appear to play a heavier role in the moves involving men among the counter stream of rural in-migration than among the dominant stream of urban in-migration. A man would not move to a rural area unless there is a fair degree of certainty of securing a job. However, there are a considerable number of men migrating to cities for reasons other than finding a job.

On the other hand, female migrants moving toward rural areas are less economically active than their resident counterparts regardless of the area of origin. Women move to rural areas largely because of marriage or other

TABLE 8
Percent of Economically Active Population Among Five-year Migrants 14 Years of Age and Over by Major Migration Streams, 1970

Migration Stream	Male	Female	Total
Rural-to-Urban	78.66	36.88	56.67
Urban-to-Urban	82.21	31.16	57.36
Urban-to-Rural	89.47	35.05	63.11
Rural-to-Rural	88.95	37.47	62.01
Rural-to-Seoul	82.07	40.25	59.52
Urban-to-Seoul	75.36	31.58	52.24
All Urban Residents	68.61	25.99	46.98
All Rural Residents	75.58	46.80	60.93
All Seoul Residents	68.90	24.56	46.34

Source: Economic Planning Board, *1970 Population and Housing Census Report*, Vol. 2, Ten Percent Sample Survey, Internal Migration, Seoul: Economic Planning Board, 1973, Table 5; and Economic Activity, Table 1.

family related matters, which might lower economic activity rates of the female migrants below the levels of permanent residents.

In Seoul, migrants are more economically active than non-migrant residents regardless of their sex and area of origin. For both sexes in Seoul, those in-migrants originating from rural areas show higher economic activity rates than those originating from other cities. Job-seeking motivations appear to prevail more strongly among migrants moving from rural areas as compared with those moving from other cities to Seoul. There is a fair amount of education related movement involved in the urban-to-Seoul migration stream. Yearly, thousands of young middle school and high school graduates move into Seoul from cities and towns all over the country in order to enter or attempt to enter the high schools and colleges in Seoul.

In might be that the higher economic activity rates among migrants to Seoul and other cities are due to higher participation rates among young migrants in their teens and early twenties who work at the expense of educational training. It was previously noted that migrants under age 25 showed lower educational levels than their resident counterparts in Seoul, causing a suspicion that their education had been suspended due to the process of moving. It is unfortunate that the published census reports do not provide an age breakdown of in-migrants by economically active status.

Occupation

Tables 9 and 10 present percentage distributions of five-year migrants and total resident population by occupation and sex for urban areas, rural areas, and Seoul. Most migrants leaving rural areas were engaged in manual labor, factory work, service (including domestic), and sales (including street vending) activities when they moved into Seoul and other cities. These occupational categories constitute more than 75 percent of the employed workers in the rural-to-urban migration stream. Manual laborers and operators alone constitute 46 percent of the employed migrants in this stream. Service work is the second most frequent category, constituting 19 percent of the rural-to-urban migrant workers. The proportion of migrants who engage in these two types of occupation (service, labor, and operative) is much higher (65 percent) than that of the urban resident workers (52 percent).

In cities, laborers and operators make up nearly half (49 percent) of the male migrant workers who have originated from rural areas. The second most frequent occupational category among men in the same migration stream is sales (17 percent), a large portion of which is probably street vending. Among their female counterparts, equal numbers are found in the labor or operative categories as in the service category; that is, 39 percent of the female rural-to-urban migrant workers engage in labor or operative type of work and another 39 percent are in a service type of work, mostly in domestic service or entertainment. The third most frequent occupational category for women in-migrants to cities is sales work (12 percent), again probably

TABLE 9
Percentage Distribution of Five Year Migrants by Occupation, Sex, and Major Migration Stream, 1965–1975

Occupation	Five Year Migrants						Residents					
	Gun-to-Shi			Shi-to-Gun			Shi			Gun		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Professional, Technical and Related Work	4.05	2.66	3.57	8.82	10.96	9.39	5.78	4.71	5.48	2.41	.94	1.83
Administrative and Managerial	.84	.10	.58	1.39	.05	1.03	2.80	.25	2.08	.44	.02	.27
Clerical	9.59	4.39	7.79	8.70	3.01	7.16	13.47	7.73	11.84	3.37	.74	2.34
Sales	16.60	11.90	14.99	7.90	10.78	8.67	19.01	20.35	19.39	4.47	5.09	4.71
Service	9.13	38.74	19.39	6.07	29.73	12.46	7.27	27.25	12.93	2.51	3.84	3.03
Agricultural, Forestry, Fishing, Animal Husbandry	3.51	2.75	3.25	17.76	31.45	21.46	6.89	8.32	7.29	72.60	81.35	76.04
Production Work, Operators, Laborers	49.30	38.97	45.72	22.41	13.40	19.98	42.96	30.97	39.57	13.31	7.8	11.18
Unclassified	6.76	.29	4.51	26.86	.57	19.76	1.59	.25	1.21	.82	.10	.54
Unknown	.18	.09	.15	.05	.02	.04	.19	.12	.17	.05	.01	.02
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
(Number in 1000s)	530	281	810	141	52	193	2,683	1,060	3,742	3,895	2,515	6,411

Source: Economic Planning Board, *1970 Population and Housing Census Report*, Vol. 2, Ten Percent Sample Survey, Economic Activity, Seoul: Economic Planning Board, 1973, Table 8.

TABLE 10
Percentage Distribution of Five Year In-Migrants to Seoul by Occupation, Sex, and Area of Origin, 1965–1970

Occupation	Five Year In-Migrants to Seoul						Seoul Residents		
	From Rural Areas			From Other Cities					
	Male	Female	Total	Male	Female	Total	Male	Female	Total
Professional, Technical and Related Work	3.10	2.38	2.83	6.30	5.53	6.05	6.10	5.84	6.03
Administrative and Managerial	1.02	.14	.70	2.70	.19	1.89	3.79	.38	2.86
Clerical	9.80	5.18	8.09	17.90	19.20	15.42	16.11	10.58	14.11
Sales	18.86	9.72	15.48	17.30	11.72	15.50	21.78	17.50	20.62
Service	9.53	44.14	22.32	8.06	46.52	20.46	7.08	33.34	14.21
Agricultural, Forestry, Fishing, Animal Husbandry	1.49	.61	1.16	.77	.30	.62	2.16	1.24	1.91
Production Work, Operators, Laborers	49.63	37.43	45.12	37.47	24.92	33.42	41.18	30.62	38.31
Unclassified	6.28	.27	4.06	9.27	.51	6.45	1.46	.30	1.15
Unknown	.25	.09	.19	.18	.08	.15	.28	.16	.25
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
(Number in 1000s)	245	144	389	102	49	151	1,181	440	1,622

Source: Same as Table 9.

mostly street vending.

One interesting property of the stream of urban-to-rural migration is the over-representation of professional workers, particularly among women, as compared with non-migrant workers, in both areas of origin and destination. Although elementary and high school teachers taking jobs in rural schools after completing training in cities are largely responsible for this, there appears to be a significant degree of involvement of professional workers in the counter stream of migration heading from cities toward regional industrial towns and villages.

Another notable property of migrants in the urban-to-rural migration stream is the exceptionally low proportion who work in farm and fishing activities after they move into rural areas. Only 21 percent of the migrant workers moving into rural areas from cities engage in farm and fishing activities compared to 76 percent in the corresponding job category among rural workers. The tendency to engage in other than farm activities is more apparent among men than women in the urban-to-rural migration stream. Eighteen percent of male migrants and 31 percent of female migrants in this stream hold farm or fishing jobs, whereas 73 percent of the rural male workers and 81 percent of the rural female workers engage in these job categories.

In general the urban-to-rural migration stream is positively selective of the higher ranking or urban related occupations as compared to those in the dominant rural-to-urban migration stream, or to those of rural workers. Movements of professional, technical, and managerial workers toward industrial towns in rural regions, or suburban towns, from large urban centers might have influenced this phenomenon. However, these statistics clearly point to the possibility that the rural migration streams carry a significant portion of those who might help speed the modernization of rural Korea.

Compared with those in the areas of origin, migrants to Seoul are selective of higher ranking occupational categories, while compared with resident workers in Seoul, migrants show about the same percentages in each of the white collar occupation groups, if they came from other cities. Those migrants to Seoul who came from rural areas are, however, much lower in their occupational ranking than those of the resident workers in Seoul. Furthermore, proportions in the service related occupation among female in-migrants to Seoul are excessively high compared to their resident counterparts regardless of the areas of origin.

It was also noted that a substantially higher proportion of migrants in Seoul with rural origins worked as factory or manual laborers as compared with migrants with urban backgrounds. Exactly 50 percent of rural male migrants and 37 percent of rural female migrants in Seoul were absorbed as production workers or manual laborers, whereas 37 percent of male migrants and 25 percent of female migrants with urban origins were found in the same job categories. As for the resident workers in Seoul, the proportions in the

TABLE 11
Average Number of Children Per Ever Married Woman by Age Group and Migration Status, 1965–70

Age	Rural to Urban Migrants	In-migrants to Seoul			All Shi	All Gun	Seoul	All Country
		From Rural	From Urban	From All Areas				
15–24	.799	.801	.738	.784	.886	1.093	.872	.988
25–29	1.740	1.695	1.536	1.645	1.842	2.494	1.745	2.146
30–34	3.080	3.010	2.723	2.909	3.072	3.970	2.887	3.534
35–39	3.999	3.933	3.524	3.782	3.945	5.035	3.663	4.547
40–44	4.610	4.511	4.034	4.338	4.630	5.763	4.291	5.282
45–49	4.857	4.812	4.354	4.644	5.017	6.022	4.695	5.624

Source: Economic Planning Board, *1970 Population and Housing Census Report*, Vol. 2, Ten Percent Sample Survey, Fertility, Seoul: Economic Planning Board, 1973, Table 1; and Internal Migration, Table 8.

corresponding job categories were 41 percent for men and 31 percent for women. It is obvious that rural migrants are adding pressure on the already crowded pool of unskilled laborers in Seoul.

Fertility Experience

Table 11 compares the fertility experience of urban migrants and migrants to Seoul with that of *Shi*, *Gun*, Seoul, and the entire country. In general, migrants exhibit lower fertility rates than those of the general population. For each age group, fertility rates, as measured by the average number of children per ever-married woman, are significantly lower for migrants from rural areas to Seoul and other cities than for rural areas or the nation as a whole.

As compared with the resident population in the area of destination, migrants to Seoul and other urban migrants experience somewhat lower fertility rates among those below age 25, but show slightly higher rates among those age 25 and over. As was the case in educational selectivity, the migration process appears to interrupt the fertility of those in the most migration prone age groups, between 15-24. Those urban migrants coming from rural areas after age 25 appear to carry with them their past rural fertility experience or partially maintain the rural fertility pattern after moving into cities, thus showing higher fertility rates than those of the native urban women.

As expected, in-migrant women in Seoul with rural backgrounds show much higher fertility rates within all age categories than those women moving from other cities. But, as compared with those of the rural women, migrants in Seoul who originated from rural areas experience substantially lower fertility rates. It is also interesting to note that migrant women in Seoul who originated from other cities show the lowest fertility rates as compared with those of the resident women in Seoul, in other cities, and in rural areas.

Conclusion

Migration in Korea, and elsewhere, is selective of the young. Young people in their late teens and twenties are found to be the most migratory in all major migration streams. In general, the largest cities draw the youngest of the migrants. Migrants in the dominant rural-to-urban stream tend to be relatively younger than those in the counter urban-to-rural stream.

Women predominate in movements originating from rural areas, while men predominate in movements originating from urban areas. In ages 15–24, the most migration prone age group, women outnumber men in all migration streams except the 20–24 age group in the inter-urban migration stream.

There is an overwhelming dominance of females between ages 15 and 24 in all migration streams originating from rural areas. In the 30 to 44 year age groups, male migrants far exceed females in all migration streams. Women become dominant again after age 50 among city bound migration streams.

In other words, women predominate in migration streams heading toward cities in all ages except the prime child rearing ages.

Migrants to cities, especially those moving toward Seoul, are as well educated as is the general population of Korea. Migration is selective of the well educated as compared to residents in the areas of origin. In the prime ages of economic activity, between 25 and 39, migrants in cities seem to fare equally well as the city residents in terms of education. However, there is evidence that migration impairs or postpones the education of the young migrants. Within the ages of the highest migration propensity, between 15 and 24, the migrants' educational level is lower than that of urban residents generally as well as that of the country's population as a whole.

Seoul attracts the best educated young people and best equipped occupationally from other cities. In-migrants from other cities appear to be equally well prepared as the residents in Seoul with respect to education and occupation. However, in-migrants from rural areas, who composed about 80 percent of the total in-migrants to Seoul during 1965–1970, are less well educated than Seoul's residents, but are better educated than those residents in rural areas.

In moves between rural and urban areas, migrants in the counter stream (urban-to-rural) are much better educated than those in the dominant stream (rural-to-urban). Surprisingly, 18 percent of males and 5 percent of females in the urban-to-rural migration stream have had at least some college education.

The positively selective character of the counter stream of migration relative to that in the dominant stream is also evidenced in the occupational composition of migrants. Rural migrants in cities mostly engage in jobs such as factory work, manual labor, service work in domestic and entertainment, and street vending. In contrast, most of the migrants moving toward rural areas from cities engage in other than agricultural activities, and many of them in high ranking or modern sector jobs.

Migrants are more economically active in comparison to the residents in the areas of destination except those females moving from cities to rural areas, or from rural areas to other rural areas, probably due to the prevalence of marriage related moves among females in these streams. The high economic participation rates among young migrants in cities appear to hamper or postpone their formal education process.

Urban migrants generally have lower fertility rates than those of the rural population of all Korea. As compared with the fertility experience of the urban resident population, migrants' fertility rates are lower only among those under age 25. It appears that the high economic participation rate among young migrants in cities also limits their fertility behavior. Urban migrant women over age 25 with a rural origin seem to carry with them the high rural fertility or maintain the rural fertility pattern after moving into cities, as their age-specific fertility rates are much higher than

those of the other urban residents.

The massive migration from rural areas to large urban centers adds problems such as squatting, traffic congestion, environmental deterioration, and underemployment in cities. From the point of view of rural areas, however, the more people who move out, the better are the prospects for improvement, especially because the rural areas are extremely overcrowded and there is virtually no more land to develop. The dominant stream of migration is always accompanied by a significant counter-stream. During 1965–1970, 1,844,000 persons moved from rural areas to cities. At the same time, 378,000 persons moved from cities to rural areas. This counter stream of urban-to-rural migration is highly selective of economically active, well educated, and occupationally well prepared persons. The large rural-to-urban migration in Korea might be helping the modernization of the entire nation by speeding up cultural change in rural areas.

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POPULATION POLICY AND FAMILY PLANNING PROGRAMS IN THE TAIWAN AREA, REPUBLIC OF CHINA

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Taiwan, which includes Taipei City and the Taiwan Province of the Republic of China, is an island about 245 miles long and 85 miles wide at its widest point. It has one of the highest population densities in the world, about 440 persons per square kilometer (1974). The first census, conducted in 1905, estimated the population to be 3.1 million; by 1943 this number had increased to 6.6 million. The population doubled again in only 24 years, reaching 13.3 million in 1967. At the end of 1974 it was 16 million.

Taiwan is in the second stage of its demographic transition. Mortality has been low for some time and fertility has also been falling. By 1974 the crude death rate had reached 4.8 per thousand. As might be expected, infant mortality is also low, about 27 per thousand. Most children born now will survive to adulthood. On the other hand, the crude birth rate remained quite high, around 40 per thousand, until the end of the second World War, and after the war it rose from 38 per thousand in 1947 to 50 per thousand in 1951. A steady decline, however, started in 1958, six years before the island-wide expansion of the family planning program in 1964, reaching 23.4 per thousand by 1974.

The natural increase rate was maintained at about 20 to 25 per thousand between 1920 and 1945. After the second World War, due to the post war baby boom and the drastic decline in mortality, the natural increase rate reached 38.4 per thousand in 1951. It was reduced to 30 per thousand in 1963 and 18.7 in 1974. Although the rate of increase in 1974 was only about half of that in 1951, it nevertheless implies that the population will double in about 37 years. How to reduce population growth further remains one of

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the most important concerns of national development.

History of Population Concern

A review of population growth in China since the turn of the seventeenth century indicates that it was arrested by the regulations pointed out by Malthus. This led Dr. Sun Yat-sen, father of the Republic of China, to state that, if China's population growth rate remained static, as it had for the previous two centuries, China would be taken over by the Western nations. This teaching represented the position of the overwhelming majority of Chinese for three decades after 1920. The situation, however, was quite different in Taiwan, especially after the second World War. The political stability, agricultural and industrial improvements, rise in the standard of living, and the introduction of modern medicine and public health measures, had reduced the death rate to a very low level in about a decade, resulting in a natural increase rate of more than 30 per thousand in the 1950s. This change prompted the Sino-American Joint Commission on Rural Reconstruction (JCRR) to issue a pamphlet in 1950 on the rhythm method of birth control. The reaction, however, was unfavorable.

Despite this unpromising beginning, by 1952 JCRR had begun a demographic survey. The study clearly indicated that the more children mothers had, the higher the death rate and the more likely the chance of the children's being placed for adoption. The completed family size was then more than seven children. The findings were circulated to government officials and leaders as well as the public.

In 1954 the China Family Planning Association was organized by a group of individuals in Taipei and family planning was introduced to women in military dependents' villages and some rural areas in the form of training in "first-aid."

In 1959, as more government leaders became convinced that a reduced rate of population growth would not affect manpower for at least 20 years, and would definitely be a stimulus to the economy, the Governor of Taiwan Province agreed to set up "pre-pregnancy health" (PPH) services at local government health stations in one of the 22 counties/cities as a part of the government's maternal and child health (MCH) program. By 1963, this program was expanded to 120 of the 361 local health stations (townships), which added a full-time PPH worker to visit women at home and to provide them with "conventional" contraceptive methods.

In 1961 the Taiwan Population Studies Center was established in the framework of the Taiwan Provincial Health Department. Its purpose was to undertake surveys and studies related to determinants and consequences of population growth, and the promotion and evaluation of the family planning activities. A year later, the classic experiment in Taichung City, now referred to as the "Taichung Study" (Freedman and Takeshita 1969) began to determine whether an organized family planning program would work in Taiwan,

what communication approaches reached women best and which contraceptive methods were most desired. The findings showed that the intrauterine contraceptive device (the Lippes loop) and systematic home visiting were the best approaches.

With the encouraging results from the Taichung Study, the PPH program was extended in 1964 to all of the plain area of the island, with the Lippes loop as the main contraceptive method. A five-year program, with a target of 600,000 loop insertions was planned to bring the population growth rate down from 3 percent to 2.5 percent in five years (1969). The main reason for this action was the recognition of the economic value of lowering the rate of natural increase. Therefore, an organized large-scale family planning program was started in Taiwan even before the formalization of policies on population.

Formalization of Policies

Even though concern about population in Taiwan increased during the late 1950s and early 1960s, it was not until 1964 that the Central Government took action to formulate a formal organization on population. The Ministry of Interior formed a Population Study Committee in 1964, but since there were politically strong members opposed to any policy regulating population growth, no recommendations were made. In June 1966 the new Minister of Interior reorganized the committee into the Population Policy Committee, effectively excluding opponents. Twelve months later two documents were produced: (1) a set of regulations governing the implementation of family planning in Taiwan and (2) an outline of population policy for the Republic of China. These were submitted to the Executive *Yuan* (Cabinet) for adoption.

In May 1968, in Taipei, on the opening day of the first East Asian Population Conference the government announced its approval of the "Regulations Governing the Implementation of Family Planning in the Taiwan Area." This promulgation effectively legitimized what had been previously an unofficial family planning program. The main points of the "Regulations" were: (a) The objectives of promoting family planning are to promote the health of people, to raise the level of family life, and to achieve a reasonable population growth rate. (b) Married women may go to a public health medical agency for the following services free or at reduced fees: ante-natal examination, maternal and child health guidance, and contraceptive and pregnancy guidance. (c) A married women with three or more children may, of her own will, ask a public health or medical agency for contraceptive service. For needy families, the fees for such services and supplies may be reduced or waived. (d) To implement family planning, the competent authorities (health organizations) at the county and city level and above may employ additional personnel according to actual needs, and each township health station should for this purpose employ additionally a full-time doctor

or midwife and a home visitor. (e) The competent authorities at the various levels should carry out timely motivation and education activities and when necessary conduct related short-time training courses or seminars. Both Taiwan Province and Taipei City promulgated a set of detailed action rules based on this "Regulation" in 1969.

On 11 May 1969, the Executive *Yuan* announced the "Outline of Population Policy of the Republic of China." The general provisions of the "outline" were: (a) To implement eugenic and health measures, to promote the physical and mental health of the people, and to uphold the family system in order to improve the quality of the population and enhance the happiness of family life. (b) To encourage the proper spacing and total number of births and to reduce deaths from diseases and disasters so that the population growth rate could be maintained at a reasonable level. (c) To formulate a national land plan to adjust the population distribution and densities between rural and urban and among different regions of the nation. (d) In order to improve the quality of population, sterilization and induced abortion should be permitted for eugenic reasons.

Implementation of Policies

Since the announcement of the population and family planning policies, the following measures have been adopted: (1) Family planning has become an important part of the national ecomomic development plan. (2) A gradual increase of the family planning budget, especially the part paid from the government regular budget. (3) Increase in family planning workers and participation of government health organizations in the provision of services. (4) Significant increase in the use of mass media for education of the public on population problems and family planning. (5) The government cancelled the subsistence allowance paid to government employees for children after the second. (6) The Ministry of Finance eliminated customs duties on contraceptives and new products for contraceptive manufacture. (7) Promotion campaigns emphasize the two-child family and the equality of sons and daughters. (8) The Population Policy Committee of the Ministry of Interior was reconstituted in 1974 to working in four sub-committees (Curbing Population Growth, Research, Policy Formulation, and Policy on Education) to formulate action plans. (9) Promotion of population education in schools and among government officials. (10) Formalization of family planning promotion organizations in Taiwan Province and Taipei City. All these measures have helped promote family planning.

Objectives, Goals, and Targets

The primary objective of the family planning program in Taiwan was to enable married couples to practice effective contraception for spacing their childbirths and to prevent unwanted pregnancies so that the health of mothers and children would be improved, the quality of population raised, and a reasonable population growth rate achieved. The objective of the program has recently been broadened to include more motivational activities aimed at reducing the ideal family size and lessening the degree of preference for sons, which are the two important obstacles to future fertility decline.

The original goal set in 1964 to reduce the annual growth rate from 3.1 percent in 1964 to less than two percent in 1975 was translated into an operational target of 600,000 loop insertions in the First Five-Year Plan (July 1964–June 1969). This operational target was not enough to achieve the growth rate target. However, it was felt to be quite reasonable at that time considering the nature of the program and the possibility of achieving it.

The overall target was divided into five fiscal years with a smaller target (100,000) for the first year (1964–65). Each annual target was divided into 12 equal monthly targets. The monthly target was then divided into 331 local targets proportional to the number of married women aged 20–44 in each township. It was soon found that this allocation was unreasonable because the proportion already practicing contraception varied widely from area to area. Therefore, the base for division of total target into local targets was changed to the number of married women who were not currently practicing birth control, estimated from the results of the 1967 island-wide KAP survey. In July 1972, the allocation system was changed again for simplicity to be proportional to the number of births in each township in the preceding year. The more births the larger the work target.

When the oral contraceptive pill was introduced into the program in 1967 and the condom in 1970 to supplement the loop, which had lower continuation rates than had been expected, a problem was raised about the unit of target because the continuation rate of the pill was poor and therefore the number of pill acceptors were not comparable to those of the loop. This problem was solved by converting acceptance of three methods into "family planning units." One loop acceptor was counted as one unit if the acceptor was 30 years or older, and 1.2 units if she was younger than 30. Ten cycles of pills or six dozen condoms distributed were counted as one unit. From the use-effectiveness point of view, these units are still not comparable because one loop insertion will be effective for about 30 months on the average while ten cycles of pills are effective for only about ten months and six dozen condoms for only about nine months. However, it was considered that to persuade one pill case to continue for ten months (or to get ten women to practice one month) or a condom case for nine months will be even more difficult than to recruit a woman for loop insertion. Of course, the appropriateness of this converting proportion is a matter of debate, but there are advantages in using this kind of combined unit.

The overall target for the Second Five-Year Plan (July 1971–June 1976) was derived from a ten-year projection of population and corresponding program workload (Committee on Family Planning 1970). According to

the projection, in order to bring the crude birth rate down to 24 per thousand (i.e., a natural increase rate of about 19 per thousand) in 1977, the number of annual new contraceptive acceptors had to be increased from 235,000 in 1972 to 310,000 in 1976, assuming that 60 percent or more of them would be loop acceptors.

Actually, the first five-year target of 600,000 loop insertions was achieved in 1969 and the goal of less than 2 percent natural increase rate was also accomplished, the rate in 1974 being 1.9 percent. The new goal is tentatively set at 1.5 percent growth rate by 1980. This is ambitious considering the factors associated with future fertility decline. It is very likely that the rate in 1980 will be about 1.6–1.7 percent unless the input of the program is increased drastically and other conditions change favorably.

For promotion of the health of mother and child, it is estimated that the prevention of high-order births during 1965–71 had reduced infant mortality 6.3 percent (or about 18 percent of the total decline of the rate in the period) and maternal mortality 14.3 percent (or about 31 percent of the total decline of the rate in the period).

Organization

From 1964 through 1968 the action administration of the program was carried on by the Committee on Family Planning (Committee on Family Health before 1966), research and evaluation by the Taiwan Population Studies Center (both organizations under the Taiwan Provincial Health Department), and the supply administration by the Maternal and Child Health Association (MCHA, a voluntary agency set up in 1964 specifically for this purpose since there were no official population policies). In 1969, following the announcement of population and family planning policies, the Committee and the Studies Center were merged into one unit, the Taiwan Provincial Institute of Family Planning (TPIFP did not gain official status until June 1975) which is an agency of the Taiwan Provincial Health Department. The voluntary MCHA now functions under the new title of the Planned Parenthood Association of China (PPAC).

Following the elevation of Taipei City to a National City in 1968, the family planning program of the City was also separated from Taiwan Province, starting November 1970 and handled by the newly established Taipei City Family Planning Promotion Center (TCFPPC).

Starting June 1971, responsibility for family planning at the national level was transferred from the Ministry of Interior to the newly established National Health Administration (NHA). Its role is to plan, coordinate, supervise, and evaluate the family planning program of the nation. It also provides financial assistance to local governments for program operation.

The Joint Commission on Rural Reconstruction (JCRR) continues to aid the program by providing accounting services, visitor orientation, customs-free entry of foreign commodities, and program consultation through its Rural Health Division. The Economic Planning Council (EPC, formerly Council for International Economic Cooperation and Development) of the Executive *Yuan* provides financial and technical assistance to the program. The Ministry of Defense assists the program through two-hour family planning education of recruits through 16 training centers and reservists through 25 training units.

Other private organizations, such as the Provincial Farmers' Association, the Taiwan Christian Service, the Taiwan Chapter of the Chinese Red Cross, the Taiwan Area MCH Center, and the Family Planning Association of China, have also been cooperating in family planning promotion. Among the foreign organizations which have been providing financial and/or technical assistance are The Population Council, University of Michigan Population Studies Center, the Pathfinder Fund, the Asia Foundation, the Japanese Association for International Cooperation in Family Planning, and the International Committee of Applied Research on Population. The Chinese Center for International Training in Family Planning was established in 1969 to improve the handling of the increasing number of international visitors to the Taiwan program.

Program Operation

The operation of the family planning program in Taiwan can be roughly divided into two phases; one is creation of demand for family planning and the other is provision of family planning services. The former is essentially an educational approach, which includes provision of information, education, and motivation. The latter is a paramedical and clinic oriented provision of services aided by special delivery programs.

The education-motivational approaches of the program include the following activities. (1) Face-to-face motivation; the program employs about 450 full-time female family planning field workers to motivate women in each township. This has been the basic and most important approach used in Taiwan's family planning program. Field workers have recruited about 60 percent of all acceptors. (2) Small group meetings; a part of the field worker's job is to organize neighborhood meetings for women for group education and motivation. This approach, if successful, is more economical and time saving than face-to-face contact. However, it has not been successful because of difficulties in gathering women for a meeting, limitations of field workers in organizing meetings, or difficulty in finding suitable places and times for meetings. Regardless of these difficulties, efforts have been made to improve this approach, especially for young women and newlyweds. (3) Various mailing programs have been tried in Taiwan to motivate couples for contraceptive acceptance. So far, only the post-partum mailing seems to be successful in recruiting acceptors. About 300,000 letters with educational material and a free coupon for loop insertion are sent every year to women who had a baby in the previous month. About 4 percent of the post-partum

women who receive a letter accept the offer of free service every year. These account for about 10 percent of the total contraceptive acceptance. In terms of cost, this is the most inexpensive approach at NT$30 (or US$0.79) per acceptor. However, because of its overlap with home visits, this program is being evaluated for its real effectiveness. (4) Extensive use of mass media to educate, inform, and motivate couples to practice family planning started in 1969 after the promulgation of a national family planning policy. Because of the increased prevalence of radio and TV, education through mass media has become increasingly important in Taiwan. (5) Population and family planning education in military and schools; two hours' education on population and family planning has been included since June 1966 at 16 Recruit Training Centers to reach young men. By the end of 1972, 730,000 recruits and 71,000 reservists received this education (Hsu 1972). A start has also been made in the schools. Text books of primary schools have been revised to include ideas of the population problem and the small family size norm. These textbooks have been tested in two primary schools. A few supplementary readers for high school students and teachers have also been developed and are being distributed. Courses on population are offered in several colleges and universities. Orientation on population and family planning are also carried out for government officials through the Provincial Training Corp and special meetings. A more organized and intensive school effort is being planned. (6) Several types of incentives are being tried in Taiwan to increase family planning practice. Such incentives include those to workers or paramedical workers for referring cases; free contraceptive services to acceptors; souvenirs for persons who attended meetings; educational savings for families who succeeded in limiting their number of children to two or three; incentives to postpone the second birth. It is hoped to expand the use of successful approaches being tried on a pilot basis.

For motivated couples, five contraceptive methods are now available in the program: the Lippes loop, Ota ring, oral pill, condom, and sterilization. Loops are inserted by medical doctors. When the loop was first introduced in 1964, insertions were done only by 300 private Ob-Gyns trained and contracted to do it. Later in 1965, because of the expansion of the program to cover a broader area, general practitioners in the townships without Ob-Gyns were also trained to do the job. Public hospital and health station doctors were also involved. Currently, loops are inserted at about 908 clinics scattered all over the island, including 633 private physicians' clinics, 62 public hospitals and 208 health stations. Eleven county health bureaus (out of 21) also organize mobile teams to do the loop insertions in the remote areas without "inserting" doctors. Usually half of the insertion fee (US $0.79 until July 1975 and US $1.30 thereafter) is paid by the government and the other half by the acceptor. It is entirely free to indigents, postpartum cases, and to the acceptors during the free campaign months.

The Ota ring was introduced into Taiwan before the second World War.

It was originally inserted by private Ob-Gyns but was added to the program as an official contraceptive method in 1973 in one county on an experimental basis and then extended to seven counties in 1974, and to the whole Taiwan Province in 1975. The logic of including the Ota ring in the program was to provide one more choice for women and to give proper credit to field workers who motivated women to adopt it. The experimental results in seven counties indicated that introduction of the Ota ring in the program did not affect acceptance of the loop, and the total IUD acceptance increased significantly. In other words, the substitution effect was small.

In the program, pills and condoms are provided through public clinics but not through private doctors. Pill cases are screened by the doctor and receive one month supply the first time but three cycles each visit after that. Field workers are encouraged to resupply pills and condoms to acceptors during home visits. Pills are also available commercially at drug stores at a cost of about US $1.50 per cycle compared with US $0.25 through the program. It is estimated that about 70,000 cycles are sold monthly, about the same amount as issued officially. Condoms are sold at drug stores at about US $0.50 per dozen compared with US $0.25 for program supplies. The monthly commercial condom sale is estimated to be about 10,000 dozen, less than half of the program supply. Other contraceptive supplies, such as foam tablets and jelly, are also available at drug stores.

Sterilization was added to the program in 1973. Sterilizations are now being done at the 16 provincial hospitals and by the 97 experienced private doctors who have a contract with health bureaus to do them. A tubal ligation operation costs about US $45 and vasectomy about US $15. Sterilization services are free to indigents and half-priced for poor people. A total of 14,771 sterilizations (1,285 male and 13,486 female) were performed in the program from 1973 to the end of 1974. Private doctors also perform sterilizations for women and men on their own. It is estimated that about 10,000 sterilization operations are done annually in the private sector.

Working Procedures

The field workers who are stationed at the local township health stations go out to visit eligible couples at home. They issue coupons to potential acceptors. The acceptor takes the coupon to a local contracted doctor for loop insertion, or takes it to a health station or a public hospital for loop insertion or prescription of pills or supply of condoms. The contracted doctor gets NT$30 (or US $0.79) per loop insertion from the acceptor and sends the coupon to the Institute of Family Planning through the local health bureau. Upon receipt of the coupon, the Institute pays NT$30 to the inserting doctor and keeps the coupon for evaluation purposes.

Supervisors bridge the field and headquarters. Provincial level supervisors supervise county activities and the county level supervisors oversee the township activities. Supervisors spend about 20 days in the field helping field

workers to solve problems and making sure that they are working according to the schedule. Work review sessions are often held to locate problems and also to get reactions of the field workers. Supervisors also conduct refresher training courses for workers to inform them of new developments in contraceptive methods, new directions of the program, and related knowledge which is useful for improving their work.

Achievements and Evaluation

Taiwan's family planning program has been very much research oriented. Before the expansion of the loop program to the whole island in 1964, a carefully designed experimental action program was carried out in Taichung. The operation of this experimental program was carefully recorded and analyzed together with the "before" and "after" surveys to provide the basic data necessary for expansion of the program (Berelson and Freedman 1964; Freedman and Takeshita 1969).

When the program was expanded in 1964, the Taiwan Population Studies Center continued to act as its evaluation unit. The Center analyzed the program's input records and conducted evaluation surveys and action oriented experimental programs to find out how well the program was meeting its objectives, what were the specific reasons for its success or failure, and how its effectiveness and efficiency could be increased.

Service statistics collected by the program include program inputs: budget and actual expenditure, manpower, number of clinics, volume of contraceptive supplies and education materials distributed, number of home visits made, number of meetings organized, and number of people who attended them; and program outputs: number and characteristics of acceptors, results of IUD and pill follow-up surveys, changes in the level of knowledge, attitude and practice of contraception (KAP), and changes in fertility levels.

The program input data are obtained through a record-keeping system at headquarters combined with regular reporting from the field. The coupon system has been the main source of information regarding program-method acceptances. This system provides prompt information on the numbers and characteristics of acceptors of a specific method by local area and referral agent (Ceinada and Chow 1969). The returned coupons have also been used as the sampling base for follow-up surveys on the use of particular contraceptive methods. So far, three island-wide IUD acceptor follow-up surveys (1965, 1967, 1969) and a series of annual follow-up surveys of the 10,000 IUD acceptors in the Taichung family planning clinic have been carried out since 1965. For pill acceptors, an island-wide survey was conducted in 1968, followed by a study to find out why the continuation rate was so low. A follow-up survey of condom acceptors was carried out in 1973. Four island-wide KAP surveys, which also contain detailed information on fertility history, have been carried out (1965, 1967, 1970, and 1973). A series of island-wide program evaluation surveys have also been conducted since 1972 by the

National Health Administration in cooperation with the Institute of Public Health, National Taiwan University. A survey of economic correlates of fertility was conducted in 1969.

From 1964 to the end of 1974, about 1.4 million IUDs (mainly Lippes loops) have been inserted by the program, of which 76 percent (or 1.05 million) were first insertions and 24 percent reinsertions. It is estimated that about 42 percent of the 2.5 million married women who have reached the age range 20–44 in the past 10 years have had at least one IUD insertion. If the number of first IUD acceptors were adjusted for aging to eliminate those who have passed age 44, then the rate of IUD acceptance up to the end of 1974 among 1.94 million married women in ages 20–44 would be about 48 percent. This is quite a high acceptance rate. As the program progresses, the rate of reinsertion increases; it was only 1.5 percent in 1964, but increased to 28.6 percent in 1969 and to 37.5 percent in 1974. However, the annual number of first insertions has been maintained at around 100,000 since 1965. The annual rate of first insertions per 100 married women 20–44 increased from 6.1 in 1965 to 6.7 in 1967 but decreased gradually to 4.9 in 1974. However, when the rate was calculated on the base of women eligible for a first insertion (i.e., eliminating those who have already had an insertion), it was 6.3 in 1965; it remained around 7.5 until 1969, and above 8.0 thereafter. It was 8.6 in 1974. These facts indicate that IUD acceptance in Taiwan has not yet reached a plateau, if one exists, and that the total IUD acceptance rate could be raised to a higher level than 48 percent.

Of the 418,000 women who accepted pills through the program from 1967 to 1974, it is estimated that about 117,000 had had no previous experience with any contraceptive method. Of the 266,321 new condom acceptors in the program from 1970 to 1974, it is estimated that about 80,000 had had no previous contraceptive experience. The program also provided 14,771 sterilization operations (1,285 male and 13,486 female) in 1973 and 1974, of which about 4,000 or 27 percent had no previous contraceptive experience.

Taking all four program methods, the IUD, pill, condom, and sterilization together, roughly 54 percent of all eligible couples had been recruited by the program by the end of 1974 to practice relatively effective contraceptive methods. This fact indicates that the program has provided a major means for the adoption of birth control leading to fertility decline.

As shown in Table 1, the mean age of IUD acceptors in Taiwan is relatively high: a median age of 32.6 in 1964 and 29.1 in 1974. The median number of living children at acceptance of the IUD in 1964 was 4.2 but decreased to 3.0 in 1974. Only 16 percent of IUD acceptors in 1966 began contraception for spacing of childbirths. In the early stage of the program, acceptors were mainly those who had already had enough children. This was natural because, with its limited resources, the program began with the "ready" group, which was easier to approach and which would have an impact in preventing excess fertility. The emphasis was later changed, however, to focus on spacing

TABLE 1

Changes in the Characteristics of IUD Acceptors, 1965–1974, Taiwan

Characteristics	1964	1965	1966	1967	1968	1969	1970	1971	1972	1973	1974
1. Median age at acceptance	32.6	32.4	32.0	31.8	31.5	31.0	30.6	30.1	29.6	29.3	29.1
2. Median no. of living children	4.2	4.1	4.0	3.9	3.7	3.6	3.5	3.3	3.2	3.1	3.0
3. Percent never used contraception before acceptance	—	—	83.0	78.2	71.6	64.3	61.5	59.2	57.0	53.9	52.1
4. Percent accepting IUD for spacing of child births	—	—	15.8	15.1	16.9	18.3	19.5	20.6	20.0	21.1	21.7
5. Percent of reinsertions	1.5	2.8	5.0	8.7	17.9	27.1	30.9	32.4	34.7	36.7	37.5

Source: Committee on Family Planning, *Family Planning Reference Book*, Vols. XI, XIII, Taichung, Taiwan: Committee on Family Planning, 1975.

among younger women with fewer children. The proportion accepting the IUD for spacing increased to 22 percent in 1974. The increase in young acceptors in the more recent years indicates that the program is now reaching more fecund young women, who have a longer fertile period ahead. This probably is one of the reasons why Taiwan has been able to recruit about the same number of new acceptors every year for the past decade without "skimming the cream."

One criticism of family planning programs has been that the majority of their recruits are often those couples already using some form of contraception, so that very little is gained by transferring a couple from a non-program to a program method. This, however, has not been the case in Taiwan. Only 17 percent of the IUD acceptors in 1966 had had experience with other contraceptives, a proportion which increased to 48 percent in 1974 due to the increase of loop reinsertions. Twenty-nine percent of the 1973 IUD acceptors had used IUDs before, but among those having a first insertion only 12 percent had previous contraceptive experience.

Another important characteristic of acceptors is their educational level. Usually the use of contraception is more prevalent among those with higher education. This is especially true before initiation of a large-scale program because better educated women have more knowledge about contraception and are faster in adopting new things. This leads some people to think that the practice of family planning will produce "reverse selection." However, Taiwan's family planning program has introduced, through massive effort, contraceptives to those who would not ordinarily adopt them, and has recruited more people from lower-status groups to correct this "reverse selection" effect. The cumulative rates of loop acceptance from 1964 to 1971 show that the loop acceptance rate is higher among those with primary education (55 percent) and with no education (51 percent) than among those with higher education (48 percent for junior high education and 38 percent for senior high or better education).

Program Effect on Fertility

According to the estimation made in Table 2, about 770,000 births have been averted by the use of the three program methods from 1964 to 1974, of which use of the IUD accounted for about 90 percent, pills seven percent, and condoms three percent. It is also estimated that the 770,000 births averted inside the family planning program (i.e., by use of program methods) accounts for about 36 percent of the total number of births averted by the use of fertility control measures inside and outside the program from 1964 to 1974. (See Table 3.) The proportion of births averted by the use of program methods increased from three percent in 1965 to about 50 percent in 1974. The effect of the program on fertility is actually greater than these proportions show because a large part of the nonprogram method users were motivated through the program and were once program method users. For example, 78 percent of the IUD

TABLE 2
Number of Births Averted by the Program, by Method and by Year, 1965–1974, Taiwan

Year	IUD		Pill		Condom		Total
	No. of current users[a] (mid-year) (1)	No. of births averted[b] (2)	No. of cycles distributed (3)	No. of births averted[c] (4)	No. of dozens distributed (5)	No. of births averted[d] (6)	No. of births averted[e] (2)+(4)+(6)
1964	16,400	—	—	—	—	—	—
1965	61,150	4,841	—	—	—	—	4,841
1966	116,100	18,051	—	—	—	—	18,051
1967	169,150	34,273	109,159	—	—	—	34,273
1968	218,700	49,933	230,660	1,928	—	—	51,861
1969	263,250	64,560	298,690	4,074	—	—	68,634
1970	308,250	77,711	405,781	5,275	119,960	—	82,986
1971	357,250	90,995	471,042	7,167	251,797	2,951	101,113
1972	396,394	105,460	713,615	11,852	298,412	6,194	123,506
1973	426,812	117,016	727,600	12,604	349,029	7,341	136,961
1974	485,963	125,995	859,713	12,851	358,505	8,586	147,432
Total		688,835	4,016,260	55,751	1,377,703	25,072	769,658

[a] Estimated from the number of first IUD insertions every year using the proportion of women who were still using an IUD at the time of Taiwan IUD-III survey (1968) by length of time after insertion. For methodology see Sun (1975).

[b] (No. of current users in the previous year) × .9 × .328, where .9 is the effectiveness of IUD use and .328 is the fertility of users in absence of an IUD, estimated from the difference between fertility before insertion (3 year average = 403) and the fertility of acceptors in the second year after acceptance (75).

[c] (No. of pill cycles distributed in the previous year) ÷ 13 × .7 × .328, where .7 is the effectiveness of use of pill, i.e., 70 percent of the pills distributed were used effectively; the figure is divided by 13 to calculate the couple years of protection; .328 is the fertility of pill acceptors in absence of pill use.

[d] (No. of dozens of condoms distributed in previous year) ÷ 8 × .6 ×. 328, where .6 is the effectiveness of condom use; divided by 8 because it is assumed that two dozen condoms are enough for three months use; .328 is the fertility of condom acceptors in the absence of condom use.

[e] Excluding the number of births prevented by 2,074 sterilizations in 1973 and 12,697 in 1974. These sterilizations averted 680 births in 1974 and 4,845 in 1975.

follow-up survey sample who had already terminated use of IUD at the time of the survey were protected from having a live birth by the use of other methods. The net result of this additional protection of IUD acceptors was a significant drop in post-insertion fertility. The fertility of the 1968 IUD survey sample decreased dramatically from 403 per thousand before acceptance (3 year average) to 75 per thousand in the second year after acceptance, a drop of 81 percent.

As stated earlier, fertility rates started to decline even before the initiation of the large-scale family planning program in Taiwan. Fertility could be expected to decline continuously at about the same rate even after the initiation of the program assuming that the program has no effect and other conditions remain about the same. The analysis of the age-specific marital fertility rates before initiation of the program (1959–63) and those after (1963–71), however, shows that the rate of decline accelerated for all age groups except those in age 15–19, which increased after 1963. The change in fertility of married women aged 25–29 turned from positive to negative, and the rate of fertility decline in other age groups (30–34, 35–39, 40–44, and 45–49) all accelerated significantly (ranging from 38 to 103 percent). (See Table 4.) Since these trends are free from the influence of two important demographic components which affect the general fertility level, viz., age composition and the marriage pattern, they show the influence of fertility control measures adopted by married couples. Therefore, the facts are consistent with, but not demonstrative of, a program effect. The fertility decline was accelerated considerably after the expansion of the program, probably due to additional fertility control measures provided by the program, assuming that the degree

TABLE 3
Number of Births Prevented Inside and Outside the Family Planning Program, 1965–1974, Taiwan

Year	Expected number of births without fertility control[a]	Actual number of births	Number of births prevented			Percentage of births prevented inside the program
			Total	Outside the program	Inside the program	
1965	550,033	406,604	143,429	138,588	4,841	3.3
1966	559,284	400,714[b]	158,570	140,519	18,051	11.4
1967	568,314	388,676[b]	179,638	145,365	34,273	19.1
1968	577,858	394,260	183,598	131,737	51,861	28.2
1969	589,623	390,728	198,895	130,261	68,634	34.5
1970	603,583	394,015	209,568	126,582	82,986	39.6
1971	616,218	380,424	235,794	134,681	101,113	42.9
1972	628,192	365,749	262,443	138,937	123,506	47.1
1973	649,508	366,942	282,566	145,605	136,961	48.5
1974	664,015	367,823	296,192	148,760	147,432	49.8
Total	6,006,628	3,855,935	2,150,693	1,381,035	769,658	35.8

[a] Estimated using the following age-specific marital fertility rates:

Age of women	Fertility rate (per 1,000)
15 – 19	500
20 – 24	490
25 – 29	420
30 – 34	330
35 – 39	230
40 – 44	130
45 – 49	36

[b] Adjusted for the effect of the 1966 census.

Source: Ministry of Interior, *Taiwan Demographic Fact Book*, Taipei: Ministry of Interior, 1972.

TABLE 4
Age-Specific Fertility Trends for Married Women in the Periods Before (1959–1963) and After (1963–1971) the Family Planning Program, Taiwan

Age group	1959–1963			1963–1971			$\frac{(R_1 - R_2)}{R_1} \times 100$
	Y_{59}	Y_{63}	R_1	Y_{63}	Y_{71}	R_2	
15–19	381.40	362.20	–0.0128	359.73	520.93	0.0474	–
20–24	403.00	425.00	0.0134	433.79	478.43	0.0123	8
25–29	374.00	281.60	0.0050	382.11	320.11	–0.0219	–
30–34	292.60	247.40	–0.0411	239.78	137.78	–0.0669	–63
35–39	206.80	149.20	–0.0784	139.02	45.42	–0.1305	–66
40–44	99.40	69.00	–0.0872	63.33	13.33	–0.1770	–103
45–49	17.40	11.00	–0.1083	10.64	2.91	–0.1496	–38

Note: Trend lines for each age group are expressed as follows:
Before program (1959–63): $Y_n = Y_{59}(1 - R_1)^n$
After program (1963–71): $Y_n = Y_{63}(1 - R_2)^n$
Where Y_n is the fertility n years after the beginning of the trend, i.e., 1959 or 1963. For example, the age specific fertility for married women in 1961 is expressed as $Y\,1963 = Y\,59\,(1 - R_1)^2$, where R_1 is the annual rate of decrease for each age group.

Source: Ministry of Interior, *Taiwan Demographic Fact Book*, Taipei: Ministry of Interior, 1964 and 1973.

of the adoption of fertility control measures after 1963 in the absence of the program would have continued to rise at the same rate as before 1963.

The decomposition of the crude birth rate decline also shows that the average annual decline in crude birth rate contributed by the decline in marital fertility was greater after the expansion of the family planning program than before. (See Table 5.) The average per thousand point decline in crude birth rate contributed by change in marital fertility was 0.66 during 1959–64 (before expansion of the program), but was 0.79 and 0.94 for the periods 1964–69 and 1969–74 respectively. The accelerated decline in marital fertility can be considered a result of the increased use of contraception provided by the program, and also by the increased use of induced abortion, which is illegal but readily available.

Other studies such as Hermalin's areal analysis of the effect of program acceptance on fertility (Hermalin 1971) and the KAP surveys all support the view that the family planning program has had a significant effect on fertility over and above the existing trend. In other words, the fertility decline in Taiwan was accelerated by the family planning program.

Perspective

The combination of an organized family planning program and a high rate of social and economic development in the past decade have produced a large-scale increase in the use of contraception and major declines in fertility. For example, as Freedman (1975) pointed out, by 1973 among women over 30 the practice of contraception had reached the 1965 levels (about 70 percent)

TABLE 5
Decomposition of Changes in Crude Birth Rates Before and After the Program Expansion and Composition of Percent Change in Crude Birth Rate, Taiwan

	Before program	After program	
	1959–1964	1964–1969	1969–1974
Crude birth rate, beginning of period	40.49	33.95	27.71
Crude birth rate, end of period	33.95	27.71	23.41
Change in crude birth rate due to:			
Age structure	1.60	0.80	–3.56
Percent married	1.15	1.33	2.24
Martial fertility	3.32	3.93	4.71
Interaction (of 3 above)	0.47	0.18	0.91
All factors	6.54	6.24	4.30
Percent decline due to:			
Age structure	24.4	12.8	–82.8
Percent married	17.6	21.3	52.1
Marital fertility	50.7	63.1	109.5
Interaction (of 3 above)	7.3	2.8	21.2
All factors	100.0	100.0	100.0
Average annual change due to change in marital fertility[a]	0.66	0.79	0.94

[a] Obtained by dividing change due to martial fertility by number of years in period covered.

Source: Calculation based on unpublished household registration data.

in the U.S.A.; the social differentials in contraceptive practice among older women, initially quite large, become very small by 1973, because lower status women adopted contraception at a particularly rapid rate. Total fertility continues to decline year by year. Fertility at ages 30 and above has already reached relatively low levels and in recent years the decline has extended to the age group 25–29. It is also important that the fertility differentials between the poor and well-educated women have decreased substantially during the past decade.

Despite the rapid increases in birth control practice and the rapid decline in fertility, a considerable further increase of population in Taiwan is almost inevitable. The fertility of young women is still very high. Fertility exceeds 200 per thousand for all women aged 20–29, and for married women, it is as high as 540 for those aged 15–19, and 445 for the age group 20–24 in 1974. One of the main reasons for the high fertility among young married women is that the already short birth interval has been shortened further over the past few years going from 16 to 12 months for the first interval and from 30 to 24 months for the second interval. The number of young women with very high fertility has also been increasing significantly since 1969. The number of women aged 20–24 increased 71 per cent from 465,736 in 1968 to 794,764 in 1974, and the number of women aged 25–29 will increase 73 per cent from 1974 to 1980. The large increase of young women implies a significant in-

crease of number of births. If the age-specific marital fertility rates remain constant at the 1973 level, the increase in the number of women alone will raise the natural increase rate back to 21 per thousand by 1980 and the annual number of births from 367,000 in 1974 to about 462,000 in 1980.

The preferred family size has fallen from 4.0 in 1965 to 3.2 in 1973, but the Coombs number preference scales (used in 1973) indicate that about a third of all women are really more biased toward larger family size than they express at a first choice. Of the 3.2 children preferred, 1.9 are boys and only 1.3 are girls. This implies that most of the couples will end up with 4 or more children at the end of their childbearing years.

A review of the past program activities reveals the following shortcomings: (1) Too little emphasis on younger women. So far the program has reached the majority of women age 30 and above and has brought their fertility to a low level, but it has had little effect on women under age 30. (2) Fertility is still higher in rural and remote areas than in urbanized areas. (3) Educational activities have not been sufficient to change people's ideas about family size and son preference, especially among the older generation. (4) Administratively, the organizational set-up for local activities was rather weak. For example, most of the employees of the program are still temporary in status with low pay. Family planning usually receives little attention at the local administrative level. The budget allocated for family planning has been too little.

It is clear from this review that the keys to further birth rate decline lie in: (1) reduction of preferred family size; (2) suppression of son preference; (3) prolongation of birth intervals; (4) later marriage; and (5) increased supply of effective contraceptive methods.

In order to achieve these goals, the following actions have been or are being taken: (1) The Population Policy Committee of the Ministry of Interior has set a tentative population growth target of 1.5 per cent by 1980, and is actively involved in the promotion of population education in various levels of schools with the cooperation of the Ministry of Education and the National Health Administration. (2) The National Health Administration's family planning budget has been increased about three times (from NT$11 million to NT$44 million) in the 1976 fiscal-year (starting July 1, 1975) to pay for contraceptive supplies and expansion of sterilization operations. (3) Increase of the number of family planning workers at township level is being considered at least in an intensive program covering eight counties (out of 21) which have relatively high fertility. (4) Educational activities emphasizing the two-child family, equality of daughter and son, advantages of later marriage, and longer child spacing, and specific knowledge on effective contraceptive methods are being carried out. (5) Starting July 1975, family planning activities at county/city and township levels will be listed as an important administrative subject under strict supervision. (6) Several experimental studies are being carried out to find solutions to various problems mentioned above.

These include the child spacing incentive project in Taichung City, premarital orientation sessions, educational savings incentive for families with 2-3 children, orientation sessions of high school teachers for population education in schools, a combined project of parasite control and family planning, value of children study, evaluation of working procedures, and all-out efforts in high fertilty areas.

To what extent the crude birth rate in Taiwan can be reduced further by these additional efforts is still unknown. It is clear, however, that the service provision alone cannot solve the problem. Taiwan has gone through the first stage of family planning programing, in which motivation of the ready-to-accept group (mainly those who were older than 30) was the main task. It has entered the second stage, in which the decline of fertility depends largely on the reduction of total family size and spacing of births. This is a new area, in which we have very little experience, but we hope to find our way.

How effectively Taiwan can achieve its new population goals is not certain. What is certain is that the government has determined to achieve these goals and efforts to do so are being made through scientific studies and cooperation among numerous agencies.

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THE CONTRIBUTION OF POPULATION AND FAMILY PLANNING TO SOCIAL AND ECONOMIC DEVELOPMENT IN THAILAND

*Vitura Sangsingkeo**

Development planning has spread throughout the world, as much to the more advanced as to the less developed countries. Among developing nations, Thailand, rightly or wrongly, believes that national planning has contributed greatly to European prosperity. The unprecedented economic expansion in Europe during the post war years has awakened the government of Thailand to the problem of raising living standards. At the same time, rapid population growth, roughly 3 percent per annum, has rendered economic planning a matter of necessity.

In development, massive changes are fundamental for the success of economic as well as social goals. The objectives of development plans have generally been to achieve social goals—improved life styles and living standards, increased opportunity, equalization of access to the benefit of modern science and technology. Economic changes themselves can be regarded only as the instrument for achieving broader goals.

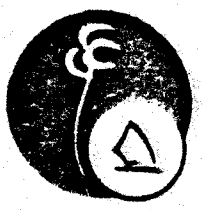
As long as human resources are both the means and the end in the economic and social development process, productivity cannot be raised unless human needs are seriously considered. It might be said that from a social perspective, the objective of development is similar to the objective of the World Health Organization, to attain insofar as possible "a state of complete physical, mental and social well-being" for a population. Socio-economic development includes the development of health programs. There is no sector of the economy—industry, agriculture, or education—which does not have a health component. Just as health cannot be isolated from other socio-economic, institutional and political factors in the developmental process, so in turn these factors cannot disregard the health component.

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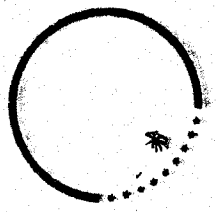
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1. INTRODUCTION

It is hardly an exaggeration to say that the interrelationships between population growth, population composition, population distribution, availability of resources, exploitation of resources and pollution are amongst the most complex ones imaginable. Furthermore, complexity increases when one considers the social, technological, political and economic forces which interact with the previous factors. Each and every component affects all remaining forces and factors and then, indirectly, itself; causes and consequences are difficult to distinguish.

Additional complexity arises from the nature of the theatre where the interplay sketched above is supposed to be staged. The South Pacific region includes a considerable number of countries which differ widely with respect to all characteristics mentioned and at first sight it might be thought that the fact that they happen to be situated in the same ocean is the only thing they have in common. On second thought, however, it is realized that nearly all territories have a similar colonial past and this provides an initial basis for discussion.

Having found an initial basis it is necessary to transform it into a more comprehensive one. To that end Section 2 is devoted to a short discussion of interrelationships between population and resource factors as they have occurred in the past.

In Section 3 the discussion centres on the present situation in the Pacific. Particular emphasis is placed upon population growth and the consequent age-composition of the population in relation to the exploitation of resources and the required extension of public and other provisions. Next, attention is focused on urbanisation and emigration, which are the main regulators for the spatial distribution of the population. This distribution is seen to have considerable bearing on the

exploitation of resources and vice versa.

It has been judged far from feasible to discuss all these things separately for all countries in the Pacific. For that reason only a few examples of the operation of the processes mentioned are given and these are characteristic, if not extreme, rather than representative. However, they do provide clear illustrations of the effects of situations which may arise in all Pacific countries.

Some issues are touched upon very briefly only. These include the possible effects on traditional values and customs, the pollution of the environment and the renewability of resources. As resources in the Pacific are mainly agricultural in nature, the latter factor is not thought to be paramount, though, of course, serious depletion of oil reserves, for example, may affect Pacific agriculture substantially through prohibitive increases in transport and fertilizers costs.

Section 4 mainly deals with the effects of the exploitation of resources and the extension of provisions on population growth, distribution and composition. In particular it is emphasized how certain policies can lead to a reinforcement of the effects which are deemed to be beneficial.

2. CAUSES OF POPULATION GROWTH IN THE PAST

Many people consulting the table of contents of this paper may be surprised to find a Section dealing with causes of population growth. There is a general misunderstanding that population growth has always existed, is a fact of life, and hardly warrants investigation. Possibly this is due to the fact that we are all daily confronted with the matter of population increase , children, whereas the matter of population decrease, dead people, only lingers on in the memory of the bereaved.

As a matter of fact, significant population growth has occurred only in three periods over the history of mankind and it is important to observe that the first two periods of growth were relatively short-lived. It occurred for the first time after 10,000 BC, when agriculture was invented (Cf. Cipolla, 1975). It is estimated that before that time, when man lived as a predatory animal, the world's population size cannot have been much in excess of five millions in view of the world's capacity to support hunters, fishermen and gatherers of wild fruits. This population size was maintained by equally high birth and death rates.

After the invention of agriculture the world's population size increased, but never surpassed the 750 million mark: this is about the maximum size that can be afforded by agricultural society (given an uneven income distribution and the level of technological sophistication prevailing).

It is illustrative to investigate how the transition from one maximum to another took place. Initially the death rate decreased as a result of a larger and more stable provision of food. The birth rate remained high and the population growth that resulted compelled the occupation and cultivation of new lands. However, after some time all accessible land suitable for agriculture had been occupied and the population density started increasing. Consequently, the higher population density led to a greater risk of epidemics, famines and wars; the death rate increased and the original balance between birth and death rates was re-established.

The second period of significant population growth commenced in the eighteenth century in Europe as a consequence of the invention of large-scale industrial activity and colonialism (Cf. Deane, 1969). New foodstuffs and other materials were introduced from overseas and these and local resources were processed more efficiently by means of new industrial techniques. The death rate decreased gradually and later on

this decrease was sustained by progress in medical technology. The ensuing population growth was coped with by emigration, to North America especially. More important, however, are the indirect means of counteracting the population growth which are generated by the industrialisation process itself through increasing the wealth and activity range available to a large number of people. In the nineteenth century these factors started to motivate people to have fewer children; at present in many developed countries the net reproduction rate[1] is close to replacement level and in some cases even lower than that.

Summarising the first two periods of considerable population growth it may be stated that both came about through a decrease in death rates which was caused by an increase in the availability and an improvement in the processing of new resources. The first period came to an end when death rates increased, the second period is reaching its final stage as a result of a decline in birth rates.

The third period of significant population growth commenced in the beginning of this century and acquired new impetus after the second world war (Cf. e.g. McNamara, 1977). The area where this growth occurs is limited to the area once colonised by European powers. Again, the growth came about as a consequence of a decline in death rates. It is important, however, to note that this decline was not caused by an increased exploitation of resources but rather by the introduction of modern medical technology. This was not accompanied with a rising level of material welfare and the establishment of institutions that are concomitant with that level, at least not to a large extent. It follows that no incentive to have fewer children emerged; the birth rate remained at its traditional level and population size started increasing.

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1. *The number of daughters a woman on the average has borne at the time of her death.*

It is only natural that people who are introduced to one aspect of another culture, and discover it to be beneficial to them, are anxious to find out whether that culture has other characteristics that might be beneficial e.g. higher level of living, educational facilities, paid employment, urbanised environment and so forth. The selection of an other culture's characteristics *truly* beneficial to an adopting society and their introduction into the existing culture while preserving at least the essence of the latter is difficult enough on its own. Unfortunately, the lower mortality introduced into those countries which have embraced modern medical technology and its immediate consequence (population growth) makes it both more difficult and more imperative that some further complex changes do occur.

3. POPULATION AND RESOURCES IN THE SOUTH PACIFIC

It might be inferred from the previous discussion that it is lack or shortage of resources that is bound to reduce or stop population growth. If no major technological breakthrough of the same calibre as the agricultural and industrial ones occurs in the not too distant future this will probably be the case, though it is not inconceivable that the effects of the pollution of the environment may prove a more limiting factor than lack of resources. However, as yet no technological breakthrough (e.g. the colonisation of space) is immediately foreseeable and the achievements of any hypothetical resource breakthrough would have to be globally disseminated to be completely effective, which is even more unlikely to happen. Therefore it would be most imprudent to count on such technological panaceas; consequently, the crucial question is whether the limiting factors are allowed to become effective or whether a more humane "solution" can be implemented in time.

The amount of time available before limitations become apparent is different for the various island countries in the Pacific. It is illustrative, however, in particular to discuss at some length the plight of the Gilbert Islands, because for this country the amount of time available seems to be especially short. Indeed, the foreseeable plight of the Gilberts gives an indication as to the kind of situation in which other Pacific countries might find themselves in the future.

The economy of the Gilbert Islands depends heavily on the revenues of phosphate mining on Banaba , formerly known as Ocean Island. It is estimated that these have accounted for 40 - 50%[2] of Gross Domestic Product (GDP) in the recent past. Unfortunately, it has been predicted that deposits of phosphate on Banaba will be exhausted by 1979 and that this will result in a fall in per capita GDP from A$540 in 1979 to A$340 in 1980. It is not surprising, therefore, that the Gilbert Islands' top priority at the moment is the development of new resources (especially exploitation of marine resources), the extension of existing non-phosphate resources (copra, training of seamen) and the abatement of the need for resources through restraining the growth of public and personal consumption.

Personal consumption growth can be restrained by lowering the growth of per capita consumption and by diminishing the growth of the number of capitas. The latter nexus has come to the fore since 1968 when an intensive family planning programme was initiated; together with emigration this has enabled the population's average annual growth rate to decline from 2.2% in the period 1963 - 68 to 1.6% in the period 1968 - 73.

It is difficult to restrain the growth of public expenditure because of the costs associated with the creation and development of resources and because of the extension of provisions

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2. *Quoted in "Gilbert Islands Key Indicators".*

required by a population that is growing and was growing even faster in the past. The latter factor will be discussed below and will make it even more obvious that the challenge facing the people of the Gilbert Islands is such a formidable one that it probably could not be coped with without financial and technical foreign aid. This would be practically certain were it not for the Revenue Equalisation Reserve Fund that, with foresight, has been built up by the government from phosphate revenues. It is expected to grow to over A$60 million by the end of 1979. If, however, the decrease in population growth, the Fund and foreign aid do not succeed in creating and developing sufficient resources by the time the Fund is depleted in the 1990's and if then foreign aid is not increased accordingly, it is likely that the mechanism that stopped population growth after the initial phase of the agricultural era, by means of epidemics and famines, will be activated again. In this respect the recent outbreak of cholera in the Gilbert Islands might be a bad omen.

There are other countries in the Pacific where a shortage of resources is felt. It may seem surprising for an island country in the middle of the largest ocean in the world, but Fiji has been struggling with a water shortage for some time. "All major development programmes in Lautoka, for example, are expected to be frozen for at least the next five years because there will not be enough water to supply new factories, hotels and housing estates. Water rationing could create a health hazard." (Fiji Times, 30. 6. '77). (Though, later on, this was actually done, even in "wet" Suva). "The cane crop of 1978 will be severely affected" (Fiji Times, 7. 11. '77). There are also land problems. In Tonga, for example, it is no larger possible to provide each male aged 16 years or over with his traditional 8¼ acres of land (Cf. McArthur, 1966).

In general, however, it is not so much the depletion or shortage of resources as the barriers to developing them, or the unwillingness to do so, which may create problems. It has been shown that Taveuni for example, an island in the east of Fiji, could theoretically support more than 15 times the number

enumerated there in the 1976 census given minimal income requirements and full use of the land potential, even at the present level of technology (UNESCO/UNFPA, 1977). However, this requires capital investment and people to develop the existing resources.

In some cases capital investment for development of resources may be financed from overseas, but it is doubtful whether this is always feasible in large enough quantities and at the right places. For this reason and for reasons of political and economic independence, it is preferable that a maximal amount of investment is financed internally. This, however, is difficult because of a relatively low per capita income level and because of the requirement to extend existing provisions such as, for example, hospitals and schools at a rate comparable to the population's growth rate.

In the Appendix the average population growth rates for 19 countries in the Pacific between the dates of the two most recent censuses are listed[3]. It is seen that 11 of these countries have growth rates greater than 2%, which, if maintained, would imply that these countries' population sizes double in less than 35 years. Most of the remaining countries (and not only these) experience substantial emigration, so that rates of natural population growth lower than 2% are much rarer than might be anticipated from the table. As mortality levels are universally low in the Pacific, it is implied that birth rates are quite substantial.

An immediate consequence of high birth and low death rates is a young population age-composition. If population growth has been about constant for a sufficiently long period of time, then, obviously, the number of people at any age is greater than that at any older age, even abstracting from mortality, and the differences are greater the higher the growth

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3. *These data are from Bakker, 1977.*

rate. This consequence of population growth *causes*[4] population growth. "Even if a fairly rapid fertility decline takes place in the developing world throughout the rest of the twentieth century, so that an average net reproduction rate of 1.00, implying replacement level fertility, is achieved by the year 2000, the population of the developing world will increase by 80% over 1970, and by the middle of the twenty-first century it will be about 2½ times larger than it is now" (Frejka, 1973).

A young age-structure also leads to a relatively non-productive population; children are consumers rather than producers. Usually, this feature is measured by means of the so-called dependency ratio, which also takes into account the non-productivity of older people: it is defined as the number of people younger than 15 plus those older than 60 divided by the number of people aged 15 - 60. In a region where population growth is low and the average age of the population is high, as in Europe, the value of the dependency ratio is .56, whereas in many countries in the Pacific it is over 1.00 and sometimes even considerably higher than that (the latter cases are special ones to be discussed below). It is seen that on the average a European in the productive age-span must care for 1.56 people, whereas a Pacific islander must care for about two people.

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4. *A highly simplified example which, again, abstracts from mortality, may illustrate the mechanism involved. Suppose a growing population counts 100 people aged 20 - 40 and 200 people aged 0 - 20. Suppose replacement level fertility is achieved. Twenty years later the 200 people that were in age group 0 - 20 are in age-group 20 - 40 and have replaced themselves so that again there are 200 people in age-group 0 - 20. Thus, in twenty years the population younger than 40 has increased from 300 to 400. The implied average annual population growth rate is 1.44%. Taking mortality into account, net reproduction implies that surviving women on the average bear more than one daughter*

A young population age-structure also has advantages. In general a young population is healthier than an old one and it may show more initiative and a greater adaptability to changing circumstances. This population might be willing, then, to take the initiative to develop resources and improve its circumstances, but it seems that often it is more eager to demonstrate its adaptability to new circumstances that are in existence already. This amounts to urbanisation and emigration ... and regularly to a deterioration in living circumstances and well-being.

It is said that just as population growth leads to a different distribution of the population among ages, it leads to a different geographical distribution. This, however, is only true if there is a perceived regional difference in existing exploitation of resources and use of provisions in relation to regional population size. If that is the case the effect on the geographical distribution of the population may be even stronger than a mere redistribution of the increase in population size. The latter point is well illustrated by the increase in population size of South Tarawa, the urban area of the Gilbert Islands. In the period 1968 - 73 South Tarawa's population size increased by 4245, which exceeded the population growth that occurred in that period in the Gilbert Islands as a whole (4191).

The perception of the urban environment as one superior to the rural environment may or may not accord to reality. It is probably true that the potential quality and diversity of medical and educational provisions, for example, is greater in urban areas. But anyone who has ever gone to a consulting hour at the main hospital in Suva, for example, knows that such an hour may easily extend to several hours and that the quantity of medical provisions per capita is not impressive even in urbanised communities. The urban crowding may have effects on realised quality too.

Other pull-factors leading to urbanisation are the perception of greater and more diverse employment opportunities, better cultural and entertainment amenities and the prestige of modern living associated with town dwelling. Unfortunately, this "modern living" often amounts to living in squatter areas, whereas the employment opportunities may not be as abundant as expected, especially when there is a continuous and considerable inflow of migrants. The existence of cultural and entertainment amenities probably is cold comfort to someone unable to find a job which can pay for those amenities.

Urbanisation may also contribute to changes in the natural environment in connection with man's food requirements and (industrial) waste products. For example, people keep drifting in to Suva and the growing number that cannot find work resorts to fishing to supplement its diet. "This has resulted in the fish in Suva waters now being smaller in number and in size" (Fiji Times, 30. 6. '77).

In the Gilbert Islands it has been proposed to construct a solid causeway to link the densly populated islet of Betio with the remainder of South Tarawa. One of the purposes of this project is to help alleviate the existing and future population pressure in heavily urbanised Betio by allowing the population to spread to relatively less populated areas in South Tarawa. This attempt to relieve population pressure on the most urbanised area somewhat resembles policies in the developed world to create "satellite towns" in the neighbourhood of main urban centres and to construct high-capacity motorways and railways to link them to the main centre. It is feared, however, that in the case of South Tarawa the blocking effect of the solid causeway on the cleansing capacity of the sea may result in further pollution of the marine environmen- which could in turn adversely affect the nutrition of the (poorest) people by a reduction in the supply of fish. Furthermore, pathogenic organisms may prosper in the polluted environment and the likelihood that this affects a non-optimally fed population is enhanced, especially by way of enteric diseases.

Social problems, too, are associated with urbanisation. Traditional values and social controls tend to be abandoned and the extended family loses some of its supportive function. Children encounter an identification problem when comparing the urban and traditional way of life; the transmission of cultural customs and values is hampered. In this context it is interesting to note that the norm regarding the length of the period of breast-feeding and sexual abstinence after childbirth can be affected in urban areas. In the 1974 Fiji Fertility Survey, for example, it is shown that both among Fijians and Indo-Fijians the period of breast-feeding is two months shorter in Suva than in rural areas. Obviously, this may adversely affect the health of new-born children (it is for this reason that the government of Papua New Guinea has prohibited bottle-feeding, except on medical indication) and it may also cause increased fertility. Lactation world-wide is estimated to prevent more births than all organised family planning programs and thus has definite contraceptive action (I.P.P.F., 1976).

The foregoing is not meant to imply there should be no urban centres in the Pacific, nor that successful adaptation to urban circumstances is not possible. It seems clear, however, that adaptation takes time so that, as long as there is a continuous inflow of migrants, the city must cope with a proportion of new and less-adapted citizens for which it must create employment, housing and so forth. It must also be reckoned that the money spent in the city for the extension of provisions cannot be spent in rural areas, so that the so-called urban paradox may occur: to increase job opportunities (and the like) only in the urban area to meet urban unemployment attracts more people to town and has the long-term effect of increasing urban unemployment (McCreary, 1973).

Emigration is another way in which young people may prove their adaptability to new circumstances to be superior to their initiative in developing new resources and creating new circum-

stances. In dealing with this phenomenon I enjoy the rare opportunity to quote a saint (Sir Thomas More) who has written about emigration in "Utopia": "If the whole island (Utopia) becomes overpopulated, they (the Utopians) tell off a certain number of people from each town to go and start a colony at the nearest point on the mainland where there's a large area that has not been cultivated by the local inhabitants".

This solution to "overpopulation" (which, presumably, is related to full exploitation of own available resources) may not always be as utopian as it looks at first sight. The colonisation and population of America, for example, can be considered successful because America, indeed, was a large area that had not been cultivated by the local inhabitants (at least not to a large extent). Also, the population of the islands in the Pacific in ancient times is an example of successful colonisation of an uncultivated (and even uninhabited) area. Today, emigration from the Pacific islands is mainly directed towards highly industrialised (developed) countries and by no means to uncultivated areas. Those areas, ironically, have been left behind at home!

The countries towards which most emigration takes place include New Zealand, Australia, Canada and the United States. Many of the emigrants are highly specialized in some industrially useful skill, that is, they have been well-educated, usually at cost to their countries of birth, and belong to the Pacific elite. Thus, emigrants are not representative of the population, as seems to be implied by More's "from each town". This aspect of emigration is well described by the term "brain drain" which explicitly shows that this is a costly affair to the country that has developed the brains by its educational provisions and that is forgoing the benefits that the brains might have brought to the country, had they not been drained abroad. Presumably, it would have been better if they were trained abroad and returned later. The latter

addition is important because there are cases in which the percentage of overseas students that returns is as low as 20 (Crocombe, 1974).

Paradoxically, the Pacific islanders that migrate to one of the borderlands do not always fare very well because of their low status in the host society. Many must settle down in the poorest suburbs and some remain unemployed for a considerable period of time. Consequently they are compelled to seek welfare benefits in their host country or are forced to take an unpleasant and low prestige job which the people of the host country decline. The children of the low income, low status workers have access to the poorest education only and soon acquire an image of themselves as inferior persons with its concomitants of resentment, hostility and maladjustment (Crocombe, 1974).

The emigrants cease to claim the use of resources and public provisions in the countries they have left and may in fact contribute to the exploitation of resources and the extension of provisions by remitting part of their income back home. This may be particularly important in the case of natural disasters destroying part of existing provisions. For example, after recent hurricanes in the Lau province in eastern Fiji, remittances from Lau islanders (temporarily) living outside the region greatly helped to finance the reconstruction of destructed village property (especially churches) as well as many houses (UNESCO/UNFPA, 1977).

Serious problems, however, may arise in the case of a relatively high number of emigrants whose age-composition is very atypical. The presence of the latter factor especially is common, but the emigration from Aitutaki[5] for example, one of the Cook Islands, exhibits both factors: more than ten percent of the island's population leaves each year for New Zealand and over sixty percent of them are in the productive age-span between 15 and 60. Many young parents leave their

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5. *The data on Aitutaki and some of the comments, but not the main conclusions, have been borrowed from Graves and Graves, 1976.*

infant children behind in the care of grandparents or siblings. This implies an unusually high dependency ratio of 1.49 for Aitutaki (1975), which means that a productive adult who has remained on the island must produce for 2.49 persons on the average, though, in that task, he may be assisted by cash remittances from New Zealand. This by itself might provide a motive for emigration. Indeed, if emigration is a self-reinforcing process the adult population of Aitutaki might soon consist solely of grandparents who are financed from New Zealand and whose main task it is to look after babies and toddlers.

Even though the situation in Aitutaki has not developed as far as that,[6] the ones who are left behind experience an increased economic burden. Because of the lack of manpower, the exploitation of land resources has diminished to a third of what it was in the 50s, so that real shortages in root crops can sometimes be felt. Also, life on the island is becoming less rewarding and less fun, because of a decline in community spirit; there is, for example, poorer attendance at village meetings and voluntary work groups.

Cash remittances from New Zealand to relatives in Aitutaki have led to an augmentation of the taste for money and a consequent desire for wage labour opportunities has largely been met by the government since the last world war, though the creation of the taste for money dates back to the war itself, when foreign engineers and military forces were constructing military requisites. From 1951 to the 60s the percentage of the adult men employed by the government increased from 13 to 45. Most of these jobs are accounted for by the Public Works and Agriculture Department, but, as during the period total population size was approximately constant and the area of cultivated land decreased considerably, this looks like an almost perfect example of the working of Parkinson's law.[7] Indeed, much of the wage labour is

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6. *Recently, the trend in emigration flows seems to have reversed because of economic problems in New Zealand.*

7. *Parkinson's law states that work expands so as to fill the time available for its completion (Northcote Parkinson, 1957).*

inefficiently used: "make-work" is designed to keep people busy during their standard eight-hour day or jobs are dragged out which could be completed far more quickly. With the money obtained, wage-earners can buy goods imported from New Zealand (at roughly double the price in New Zealand). An increasing part of these goods consists of food, people are "fishing in the stores". However, in view of extremely low wages (take-home pay $15 a week), almost all employed men must also fish and maintain a garden for food crops. This must be done after working hours, so that little time is left for communal activities, as mentioned before.

It might be expected that this "development" at least would lead to a decrease in fertility and the natural growth rate of the population. Indeed, the general fertility ratio (GFR)[8] has declined, but this is rather a result of a change in the age-composition of the women in fertile ages; as most births occur to women younger than 30 and significantly it is this group that emigrates, the decline in GFR is no indication of a change in fertility behaviour. This is somewhat surprising because women, too, are engaged in wage labour. It might be that the impact of "development" is counterbalanced by a change in attitude that has been observed in the Lau province in Fiji, another area of considerable outmigration; children are seen as a blessing and not a liability in ageing communities (UNESCO/UNFPA, 1977).

It must be stressed that the previous discussion about urbanisation and emigration does not imply that people are to be blamed when they prefer to urbanise or emigrate instead of developing local resources. Often they have no choice in view of the impossibility of developing resources. They lack means of investment which partly follows from the very population growth and the concomitant urbanisation. In this respect, inequality within the rural area itself can also play an

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8. *Number of births in a year divided by average number of women aged 15 - 44.*

important part (Cf. Ward, 1965). As one islander in southern Lau put it: "Not enough land; not enough copra; not enough money; nothing to spend the money on and prices too high anyway; wish to migrate to Suva" (UNESCO/UNFPA, 1977).

In conclusion it may be said that most countries in the Pacific are not close to the exhaustion of physical resources, but the growth in resource exploitation is limited, whereas the spatial distribution of the growth is uneven and not in accordance with population growth. As a consequence population growth (and sometimes more than that) is redistributed to where resources are being actively exploited (developed countries, emigration) or where (perceived) growth in resources exploitation and the ensuing growth in public provisions is relatively great (urbanisation). Often emigrants and new city dwellers face severe problems. Moreover, the disproportionate urban growth rates in population size and resource exploitation tend to be self-reinforcing so that the rate at which the exploitation of rural resources grows is adversely affected. Furthermore, urbanisation almost invariably contributes to pollution of the environment. The impact of these developments on natural population growth in countries in the Pacific has been slight.

4. IMPLICATIONS FOR THE FUTURE AND CONCLUSION

It has been mentioned before that, given the absence of a major technological breakthrough, the growth of population size must reach an asymptote some time in the future because of lack of resources. The precise location of this point in time depends on per capita consumption and on the supply of consumable goods, that is, on the proportion of resources that is actually exploited. Given a certain amount of supply and a certain income distribution, total population size is

inversely related to per capita consumption, so that, if it is desired to maximise the latter quantity, total population size must be as small as possible. Furthermore, given a certain amount of supply and a certain per capita income level, the total population size that can be afforded is greater when the distribution of income is more equal.

It follows that the point in time when population growth must stop is furthest away when the exploitation of resources is maximal and when the distribution of income is most equal. It may even - and hopefully - never be reached if the growth of population is stopped voluntarily before it is stopped by coercion. It has been shown that at present there are few indications of an important decline in the rate of natural population growth in the Pacific and that the population-related developments that occur (urbanisation, emigration) do not generally lead to a decrease in fertility nor to a greater exploitation of indigenous resources.

Presumably, it is in everybody's interest that resources be exploited to the fullest possible extent. This, however, requires capital which is hard to generate in developing countries, amongst other things because of a high dependency ratio and because of the required extension of existing provisions in a growing population that, moreover, is urbanising. In addition know-how is required. In view of these considerations and in view of their own interest in the availability of resources, it is imperative that the developed world countries provide financial and technical aid. The increase in income in developing countries that might result from this aid (amongst other things) furthers equality in income on a world-wide scale, whereas, as will be shown, in the long term everybody can be expected to gain from this aid.

Governments of the developing countries must decide what is to be done with the aid and with the money that is obtained from internal sources. It is essential that it is the government of the country itself that decides on this, because it has the required know-how concerning local circumstances, though at times the assistance of foreign experts may be invoked when technical matters are to be dealt with. The local decision-making is particularly important because foreign investors are inclined to invest mainly in relatively localised lucrative sectors (mining centres, tourist areas, urban centres), thus contributing to further urbanisation, but leaving the majority, the rural people, unaffected. In this context it is illustrative to quote the example of the Vatukoula gold mine in Fiji, which is almost exhausted but is kept running with a $2 million government subsidy in order to preserve the 1500 mine jobs. "So far it has proved impossible to attract other industry to Vatukoula, despite special concessions." (Fiji Times, 19. 11. '77).

Having obtained foreign aid on the basis of international solidarity, the governments of the developing countries might pursue internal solidarity. In practice this means that emphasis is placed on rural development and the exploitation of local resources. An important aspect would have to be the improvement of the attractiveness of village life e.g. through better educational and medical facilities, better housing, more amusement. The exploitation of resources can be expected to lead to more (wage) employment.

Presumably, the first consequence of this policy is a lessening of the rural-urban drift, so that less money needs to be spent in urban areas and more is available for further rural development. This is the first positive feed-back effect. Secondly, the exploitation of resources is enhanced, which may result in a decrease in imports (especially of food) or in an increase in exports. This provides another incentive to the process that has taken off.

The supply of resources increases, but as long as population growth continues, only time has been gained. However, population growth may be expected to decline too and this is the most basic result of the policy. Also, this result enhances per capita income and, therefore, provides a third positive feed-back effect. It follows in particular that the age-structure of the population becomes less young and that the dependency ratio declines. In fact this is an illustration of the mechanism that if one factor, from a complex of factors balancing one another in a vicious circle, is removed, the whole system is destabilised and must find some new equilibrium.

The decline in growth rate by means of a decline in the birth rate is analogous to the decline that occurred in the developed world after the industrial revolution when the fruits of the revolution were disseminated over large parts of the population. In developing countries the same occurs: between developing countries with comparable gross national product per capita, differences in fertility reduction can be related positively to differences in the equality of distribution of income and the social services, suggesting that development strategies stressing equity create the best environment for reductions in fertility (Rich, 1973).

In order to see whether this is true in the Pacific too, we turn to Fiji, which, supposedly, is the only country in the region possessing the relevant information in statistical form. Firstly it is to be noted that although average incomes per head of population probably increased somewhat in real terms since 1953, average incomes in rural primary industries have fallen in real terms (Fisk, 1970). While the average industrial worker in Suva had an income of $1404 per year in 1974, only some 30 per cent of the households in the rural district of Taveuni, for example, enjoyed an income above this figure, even allowing for subsistence income

(UNESCO/UNFPA, 1977). The impact of this inequality on fertility can be seen in the following table[9]:

Mean Number of Children Ever Born

	Fijians						Indo-Fijians					
Years since marriage	0-4	5-9	10-14	15-19	20-24	25+	0-4	5-9	10-14	15-19	20-24	25+
Type of place of residence:												
Suva	1.0	2.6	(3.0)	(4.5)	(4.4)	(5.5)	0.9	2.3	3.2	4.3	4.8	6.4
Rural area	1.0	2.6	4.0	5.4	5.9	7.0	0.9	2.5	4.1	5.2	6.3	7.5

Among Fijian women the average number of births during the first 7.5 years of marriage is 2.6 regardless of type of place of residence. Among Indo-Fijian women there is no rural/urban difference in the mean number of children born during the first 2.5 years of marriage either, but in the next five-year period a slight difference in the expected direction arises. In subsequent periods a considerable difference emerges, both among Fijians and Indo-Fijians. It is worthwhile to note that the concentration of childbearing in early marriage resembles the child-spacing that obtains in the developed world. Moreover, it is important to realize that the table overestimates[10]

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9. *From Table 29 of the principal report on the 1974 Fiji Fertility Survey. Numbers between brackets refer to 20-50 respondents, the remaining figures are based upon more than 50 respondents.*

10. *To disentangle these and other complexities it is highly desirable that a multivariate analysis of the data collected in the FFS be performed.*

the actual fertility in later marriage in Suva because many of the children counted in this group have been born ten or more years ago. In view of the different rates of development in Suva and in rural areas, the difference between the two places was smaller in the past. Furthermore, some of these children's parents have left a rural area for Suva in the not too distant past, so that in fact they were born in a rural area.

In order to see more precisely why fertility is lower in Suva than in rural areas, we quote some more data from the fertility survey[11]:

Mean Number of Children Wanted by Currently Married Women

	Fijians	Indo-Fijians
Level of Education		
No Schooling	(3.6)	4.9
Lower Primary	4.8	4.4
Upper Primary	3.9	3.5
Secondary or Higher	3.3	2.9
Husband's Occupation		
Professional and Clerical	4.0	3.6
Sales and Services	4.0	3.7
Specialised Farmer	4.8	4.6
General Farmer	4.3	4.8
Skilled Manual	4.0	4.1
Unskilled Manual	3.9	4.2
Pattern of Work		
Worked after Marriage at Home	4.5	4.2
Never Worked	4.4	4.2
Worked only before Marriage	4.0	3.6
Worked after Marriage away	3.6	3.9

11. *From Table 41.*

The impact of the level of education upon the desired number of children is impressive, both among Fijians[12] and Indo-Fijians. The difference among women having enjoyed upper as opposed to lower primary education is especially substantial and it might be a good investment to provide facilities and incentives to maximise enrolment in upper primary education in all areas where they are not available. One of the incentives might be working opportunities for women, which again has a considerable impact upon the desired number of children, especially among Fijian women. It seems that for Indo-Fijian women the nostalgia for employment forgone is a greater disincentive to childbearing than the actual employment. Another supposedly cultural difference between the two major Fijian population groups is in the impact of husband's occupation on desired number of children; this impact is smaller for Fijian women, but for both groups it holds good that the provision of blue and white collar jobs for males may lead to lower fertility.

It stands to reason that women must be enabled to achieve the family size they desire for all the reasons mentioned above, but also in order to ensure the happiness and good health of the woman, her children and the family in general. From a medical point of view a proper spacing between births is especially important. It follows that an adequate supply of cheap and reliable contraceptives is essential.

In conclusion it may be said that emphasis on rural development can be expected to delay the emergence of limiting factors to population growth in the Pacific. This is a consequence of greater utilisation of local resources, which can also be expected to lower fertility and population growth. Furthermore, it is likely that a policy of resource development in rural areas will also promote the happiness and health of the family in the short run.

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12. *The information concerning the Fijian "no schooling" category must probably be disregarded in view of the number and status of the respondents.*

APPENDIX

Summary of Population Size at the time of the most recent Census and Growth Rate since previous Census for Countries in the Pacific.

Country:	Last Census Year: WP'79	Population Size:		Annual Growth Rate (%)
American Samoa	1974 1980	29,191[1]	32,395	1.61
Cook Islands	1976 1976	18,112[1]	18,128	-3.88
Fiji Kiribati(78) Tuvalu(79)	1976-5 88,068	585,000[1]		2.05
Gilbert & Ellice Islands <	1973	57,813		1.54
Guam	1970 1980	84,996	105,821	2.37
Wallis and Futuna	1976 9,162	9,162		0.99
Nauru	1966[2] 1977	6,057	7,254	5.43
New Hebrides	1975 1979	94,000[3]	112,304	2.31
New Caledonia	1976 133,233	133,235		3.94
Niue	1976	3,858[1]		-5.05
Norfolk Island	1971	1,683		7.58
Papua New Guinea	1971 1980	2,489,935	3,006,799	2.61
Pitcairn Island	1975	70		-6.07
French Polynesia	1971 - 1977	119,168	137,382	4.16
Solomon Islands	1976 196,823	196,823		3.35
Tokelau	1972	1,599		-3.20
Tonga	1976[4] 90,128	90,128		1.52
Trust Territory Pac. Isl.	1973 - 1980	115,251	114,974	3.57
Western Samoa	1976 151,983	151,275[1]		0.62

1. *Provisional figure*
2. *Last census held in 1977*
3. *Estimate, not based on census*
4. *"De jure" census*

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QUELQUES PUBLICATIONS DEJA PARUES DANS CETTE SERIE

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South Pacific Commission (1976) Report of sub-regional training course on food crops and home economics, Pago Pago, American Samoa (August 16-27, 1976).

Previous occasional publications were un-numbered. However for ease of identification it has been decided that from now on all publications in this series will be numbered.

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Demographic, Social, and Economic Conditions in the U.S. Pacific Islands Based on the 1990 Census

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September, 1992

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INTRODUCTION

This short paper presents comparative statistics on population items from the 1990 Censuses of Population and Housing for the United States, Guam, American Samoa, the Commonwealth of the Northern Mariana Islands (CNMI), and the Republic of Palau. The final paper will also present comparative data from the 1990 Censuses of Puerto Rico and the Virgin Islands as well, but data on social and economic characteristics are not yet available from these areas. Data on housing characteristics for the United States and its territories will be presented in separate paper.

For the 1990 censuses, Population Division worked with Puerto Rico, the Virgin Islands, and the Pacific Islands areas to develop population items which were as close as possible to the U.S. items, but also permitted satisfying local needs. In most cases, the questionnaire items were identical. However, some items such as literacy, parental birthplace, military dependency, and vocational training were not on the 1990 U.S. questionnaire, so we cannot present comparable data.

Each of the Pacific Islands areas will have a 1990 census monograph which will look at historical trends for the population and housing items. The governments of Guam (Barcinas, Levin, and Naval 1988), and American Samoa (Filiga and Levin 1988) published 1980 census volumes. The CNMI also developed a 1980 census volume (Borja and Levin, ms) but did not publish it. The 1990 Census volume for Palau (Levin, Hosei, and Gorenflo, 1993) will be complete before the end of the year, and the volume for Guam will also be finished early in 1993.

DEMOGRAPHIC CHARACTERISTICS

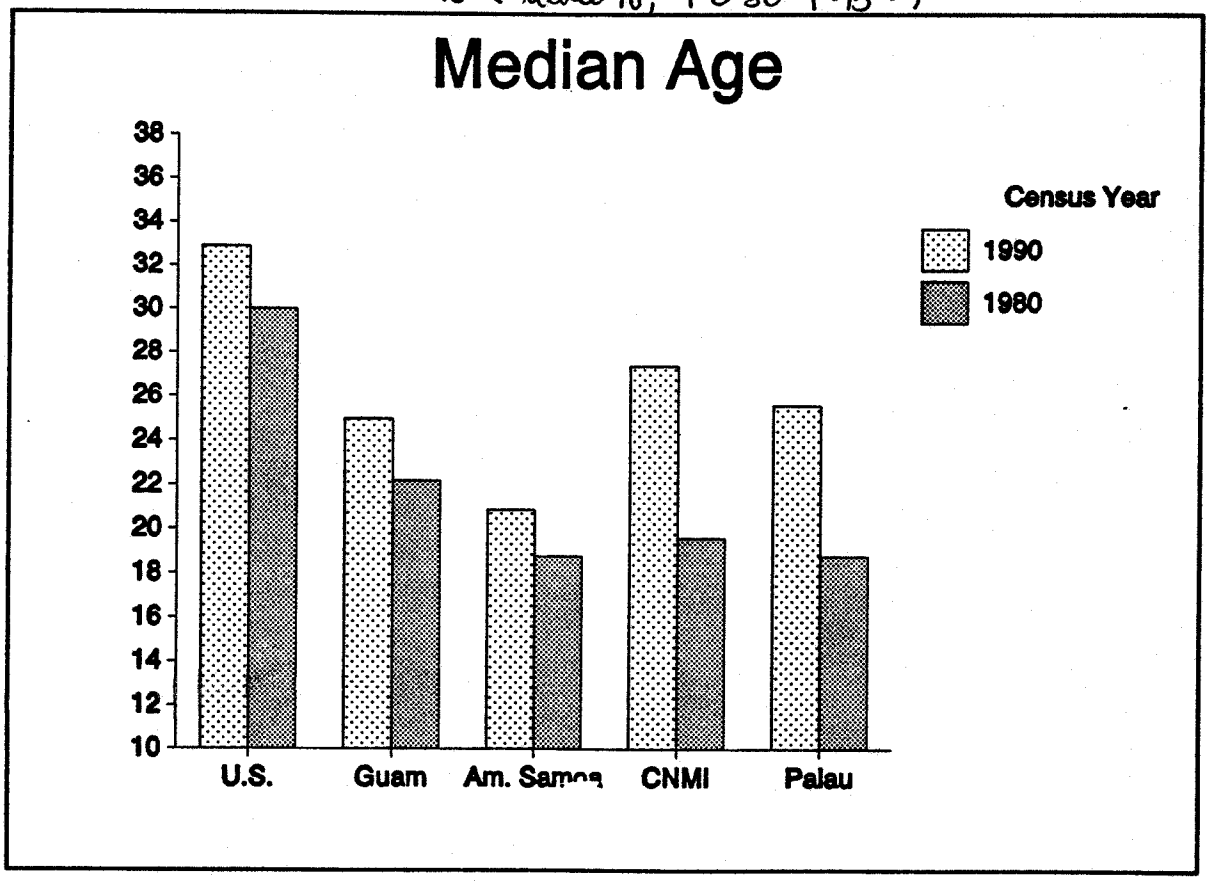
Median Age. The median age in the United States in 1990 -- that age having half the population and half the population older -- was 32.9 years, an increase of almost 3 years from the 30 years in 1980 (Table 1). The median age for the United States was more than 5 years older than the oldest of the Pacific Islands areas - CNMI at 27.4 years. Palau followed at 25.6 years, Guam at 25.0, and American Samoa had the youngest population, at 20.9 years, fully 12 years younger than the median for the United States.

Table 1. Median Age by Sex: 1980 and 1990

Sex and Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
Total:					
1990.....	32.9	25.0	20.9	27.4	25.6
1980.....	30.0	22.2	18.8	19.6	18.8
Males:					
1990.....	31.6	25.2	20.6	29.9	26.0
1980.....	28.8	22.2	18.3	20.9	18.7
Females:					
1990.....	34.0	24.9	21.2	24.9	25.1
1980.....	31.3	22.2	19.2	18.3	18.9

Sources: 1990 - (table 8, CPH -
1980 (table 16, PC80-1-B .)

US 1980 PC80-1-C1, table 98



The median age increased by about 2 years in American Samoa, and a little more than 3 years in Guam. The median for Palau, however, increased by almost 7 years and by almost 8 years

in the CNMI. Between 1980 and 1990, both Palau and CNMI experienced massive in migration, particularly of Asian laborers, the majority of whom were older than the median ages in these area.

In the United States, as in most countries, the median age for males was ~~~~ TO BE DONE

The differences in the age distributions are represented by looking at one group -- those aged less than 5 (Table 2.) While about 7 percent of the total U.S. population was less than 5 years old, about 9.5 percent of CNMI's population was in this category, 10 percent of Palau's, 11 percent of Guam's, and almost 15 percent of American Samoa's population.

Table 2. Percentage of Population Less than 5 Years: 1980 and 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	7.4	11.3	14.9	9.5	10.0
1980.....	7.2	12.3	14.8	14.7	11.6

Sources: 1990 (Table 1, CPH, 1980, PC80-1-B, table 15.

US 1980 PC 80-1-C1, table 98

Males per 100 Females. Most human populations have more females than males because male mortality is higher. The common demographic measure is the number of males per 100 females. Hence, the number of males per 100 females in the United States increased only slightly between 1980 and 1990 -- from 94.5 to 95.1 (mostly because of increased female mortality) (Table 3).

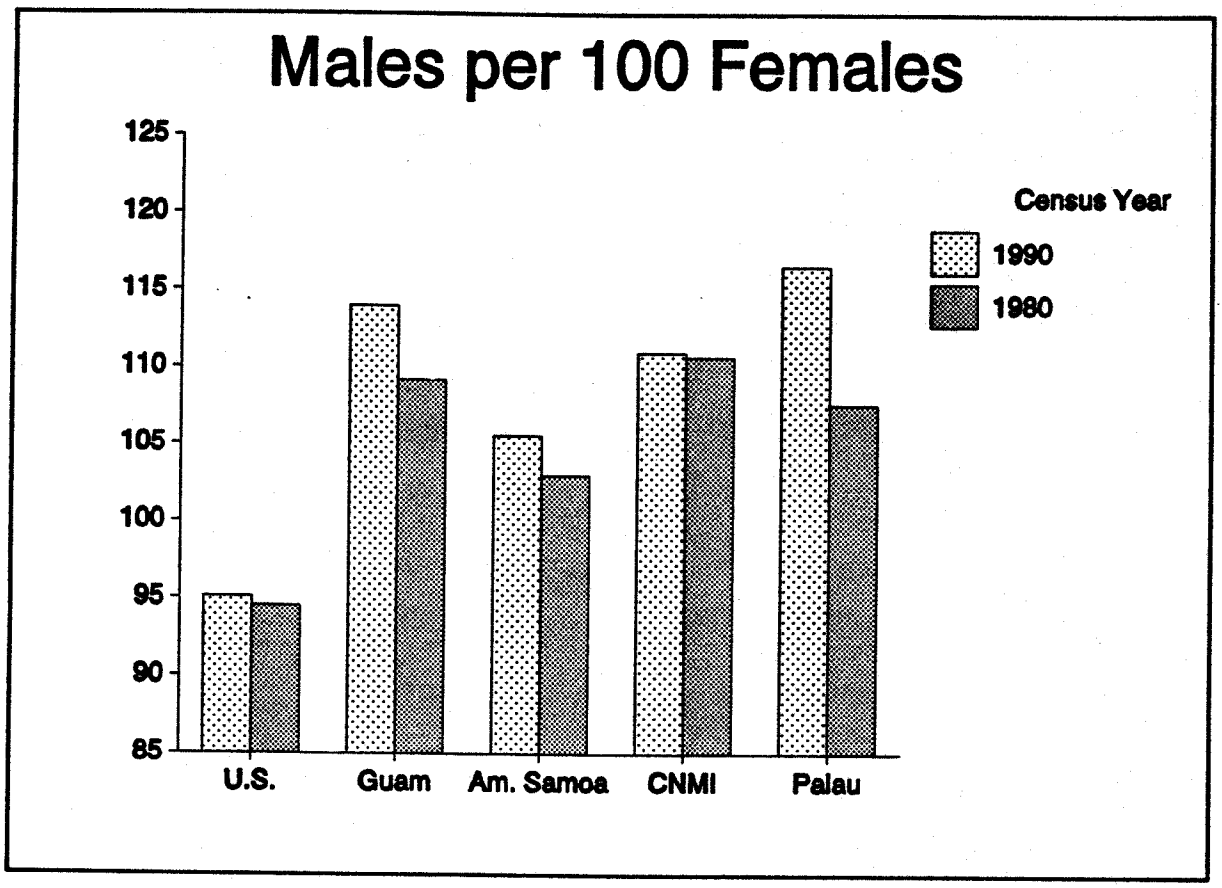
Table 3. Males Per 100 Females: 1980 and 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	95.1	114.0	105.6	111.0	116.6
1980.....	94.5	109.2	103.0	110.7	107.6

Sources: 1990 (Table 8, CPH- 1980-PC80-1-B, table 15

same

Each of the Pacific Islands areas, however, had more males than females, and, except in the CNMI, the proportion male became much more pronounced in 1990 than in 1980. That is, while the number of males per 100 females in the CNMI stayed at about 111 between 1980 and 1990, the number of males per 100 females increased from 103 to 106 in American Samoa (the least male of the 4 areas), Guam increased from 109 to 114, and Palau, from 108 to 117. Although increased female mortality may be contributing a small amount to this change, most of the change is due to selective immigration of males to these areas, particularly to Palau.



Persons per Household. The average number of persons per household decreased in the United States and all of the Pacific Islands areas between 1980 and 1990. The decrease in the United States was from 2.75 persons per household in 1980 to 2.63 in 1990 (Table 4). None of the Pacific areas, of course, had this small number of persons per household. Guam, the closest to the United States, economically, was also closest demographically, in this case about 4 persons per household, sown slightly from 1980. CNMI and Palau each decreased by about 3/4ths of a person per household, with CNMI at 4.6 in 1990 and Palau at 5.0. The number of persons per household in American Samoa, however, remained very high, at 7.0, showing continued housing of extended families.

US 1990 CPH-1-1

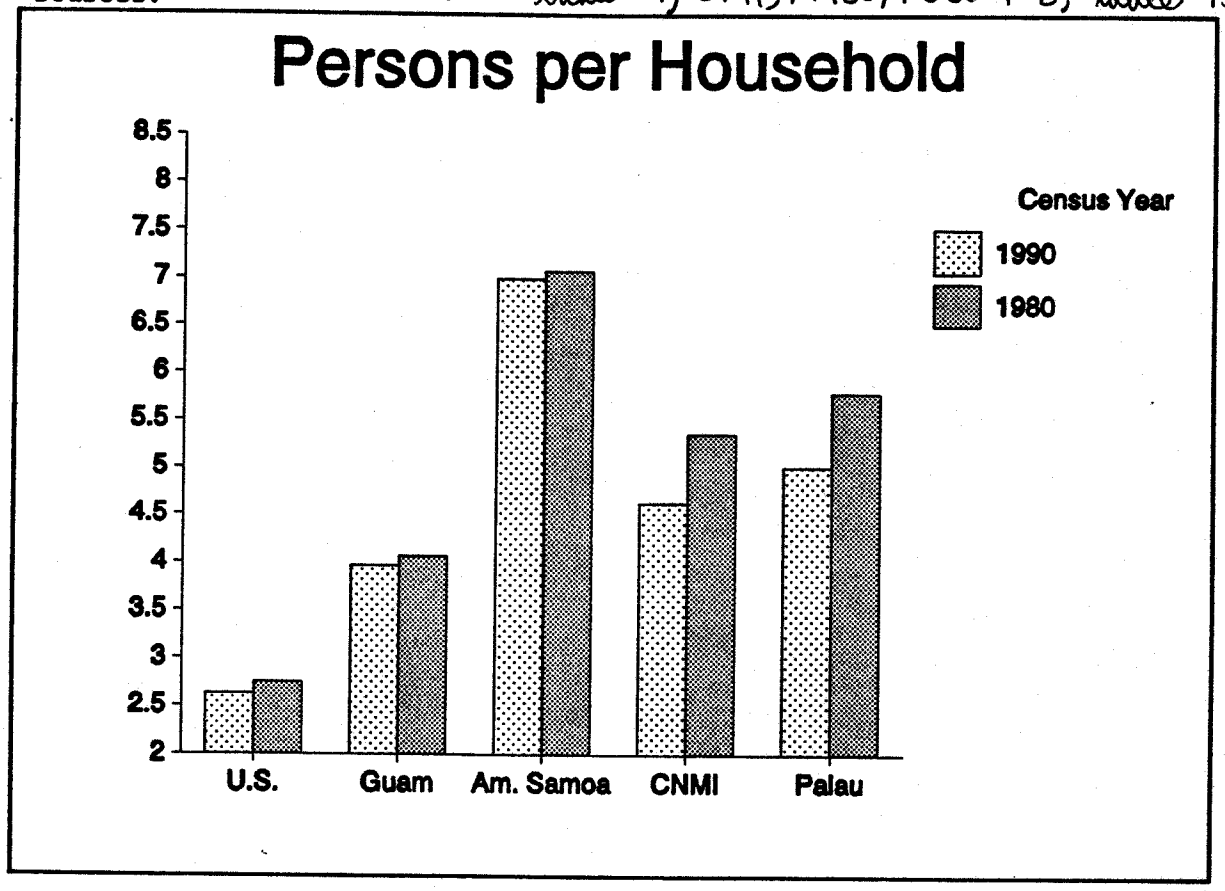
US 1990 CHP-1-1, table 3 U.S.

1980- PC80-1-B1, table 46

Table 4. Persons Per Household: 1980 and 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	2.63	3.97	7.00	4.63	5.01
1980.....	2.75	4.07	7.08	5.36	5.79

Sources: 1990 - (table 7, CPH), 1980, PC80-1-B, table 15



Percent Living in Households. Except for CNMI, the U.S. and the Pacific areas all showed high percentages of persons living in households (compared to group quarters.) Almost 99 percent of persons in American Samoa lived in households. In CNMI, on the other hand, less than 3 out of every 4 of the residents lived in households (Table 5). Most of the rest were garment and other factory workers, living in dormitories.

Table 5. Percent Living in Households: 1980 and 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	97.3	93.6	98.9	73.5	95.5
1980.....	97.5	95.3	99.0	96.7	97.5

Sources: 1990 (table M, CPH), 1980- PC80-1-B, table 15

Family Type. About 79 percent of all families in the United States in 1990 were married couple families, that is, at least a husband and wife, whether or not children were present as well. In 1980, 83 percent of the U.S. families were in this category (Table 6). The percentage of married-couple families also decreased on Guam, and in the Northern Marianas, but remained about the same in Palau and American Samoa. Only about 3 in every 4 families in the CNMI and Palau were married couple families in 1990.

Table 6. Percent of Families Being Married-Couple Families: 1980 and 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	78.6	78.1	81.8	74.3	75.5
1980.....	82.8	84.8	81.1	79.7	75.4

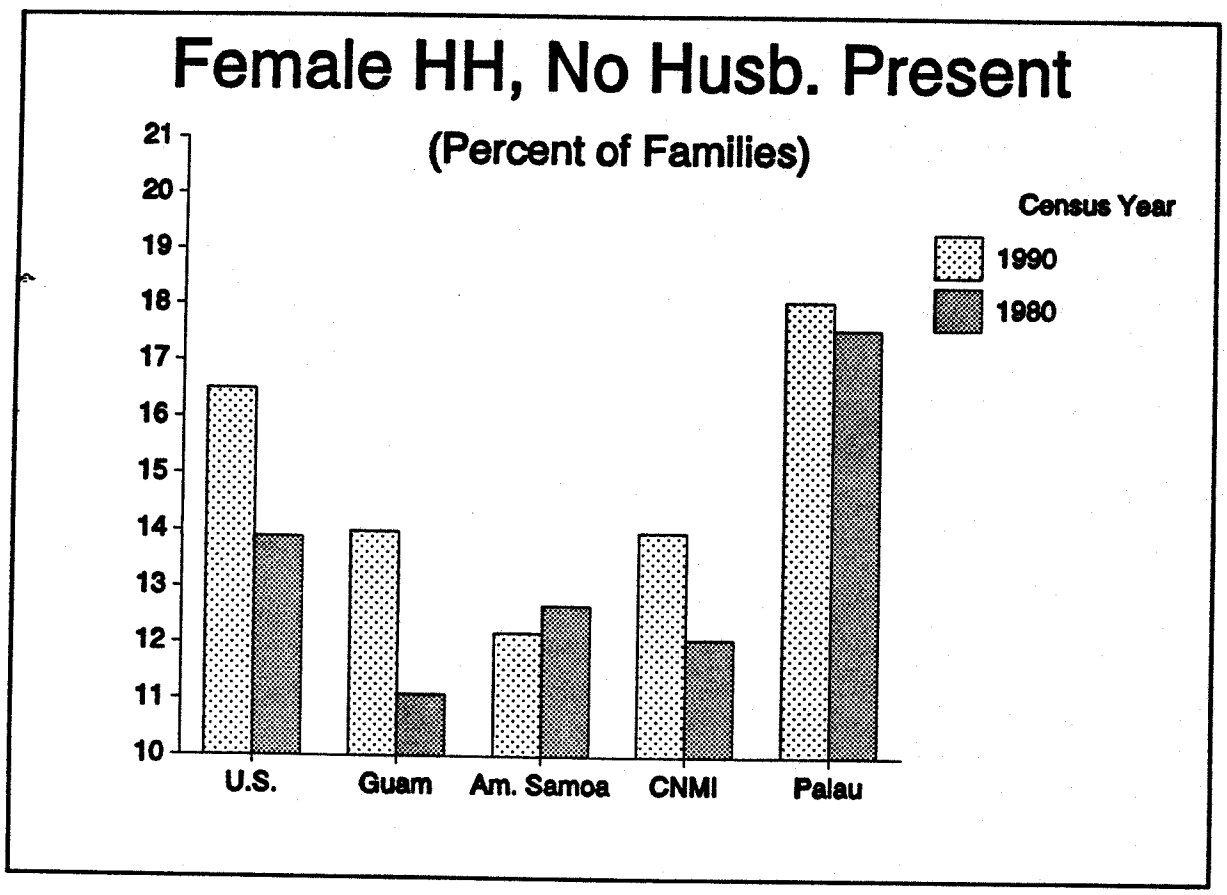
Sources: (1990 US, CPH 1-1, table 3) (table M, CPH) - 1980, PC 80-1-B, table 15

The percentage of U.S. families with a female householder having no husband present increased between 1980 and 1990, from 14 percent of the families in 1980 to 16.5 percent in 1990 (Table 7). The percentage of American Samoa's families in this category actually decreased slightly between 1980 and 1990, but all of the other areas showed increases. More than 18 percent of Palau's families were in this category, but only 12 percent of the families in American Samoa.

Table 7. Percent of Families with Female Householder, no Husband Present: 1980 and 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	16.5	14.0	12.2	14.0	18.1
1980.....	13.9	11.1	12.7	12.1	17.6

Sources: 1990 (table M, CPH), 1980, PC80-1-B, table 15



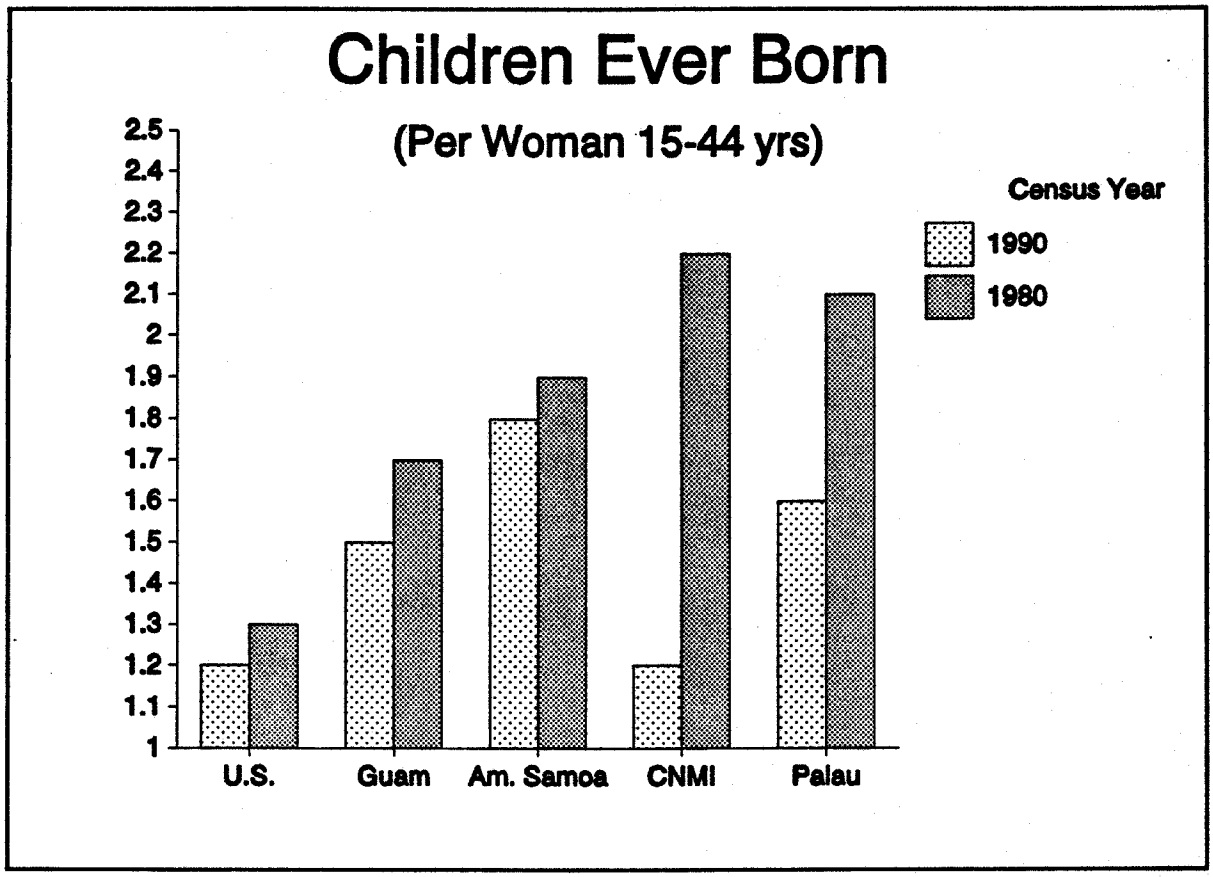
Fertility. The number of children ever born to females 15 to 44 decreased in the United States from 1.3 to 1.2 during the 1980s (Table 8). Decreases in each of the Pacific Islands area were much steeper. The decrease was steepest in the CNMI, which went from 2.2 children per woman in 1980 (the highest in that year) to 1.2 in 1990 (the lowest in that census year.) The decrease was one full child.

Table 8. Children Ever Born per Woman 15 to 44 Years: 1980 and 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	1.2	1.5	1.8	1.2	1.6
1980.....	1.3	1.7	1.9	2.2	2.1

Sources: 1990 (table 6, CPH), 1980 PC80-1-C/D, table 19.

US 1980 - PC80-1-C-1, table 100



The other areas experienced smaller decreases. The children ever born per woman declined from 2.1 to 1.6 in Palau (about half a child), from 1.9 to 1.8 in American Samoa, and from 1.7 to 1.5 in Guam.

SOCIAL CHARACTERISTICS

Birthplace. The percentage of persons born and living in the United States decreased somewhat between 1980 and 1990, from 94 to 92 percent (Table 9). The percentage of American Samoa born in American Samoa continued its long decline, going from 58 to 55 percent during the decade. Although more than half of American Samoa's population is still American Samoa born, the percentage continues to decrease towards the halfway level.

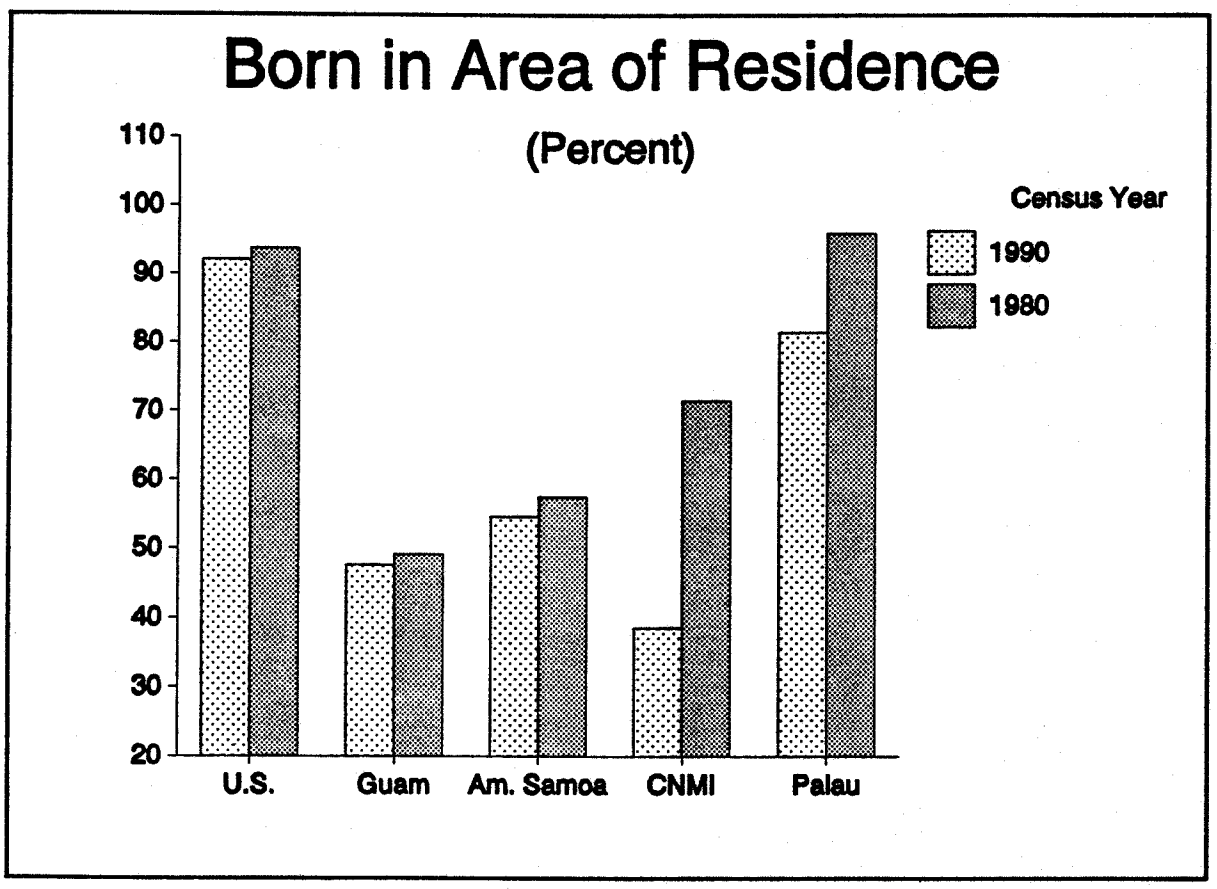
US 1990 Press Release CB92-87

Table 9. Percent Born in Area of Residence: 1980 and 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	92.1	47.7	54.7	38.6	81.5
1980.....	93.8	49.2	57.5	71.5	96.0

US 1980. PC80-1-C-1, table 99

Sources: 1990 (table 9, CPH, 1980, PC80-1-C/D, table 20



More than 4 out of every 5 persons in Palau were Palau born in 1980, but this proportion still represented a considerable decrease from the 96 percent of 1980.

Less than half of Guam's population was born on Guam, partly because of the large number of military personnel who are on the island only temporarily, and partly because of the increasing numbers of immigrants on Guam -- the percentage Guam born decreased from 49 percent in 1980 to 48 percent in 1990. CNMI experienced by far the biggest decrease in percentage born

in CNMI. While 72 percent of the Commonwealth's population was born in the Commonwealth in 1980, this percentage decreased to 39 percent in 1990, attributable to the extremely large influx of foreign workers.

Residence 5 Years Before the Census. Residence 5 years before the census shows short-term migration, contrasted to data on birthplace, which gives long term migration. More than half of the United States population 5 years and over in 1990 -- 53 percent -- had lived in the same house in 1985 as 1990, and only 2 percent had lived outside the United States in 1985 but inside in 1990 (Table 10).

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Table 10. Percent Persons 5 and Over Living in Same House or Outside Area in 1985: 1990

Residence in 1985	United States	Guam	American Samoa	Northern Mariana Islands	Palau
Same house..	53.3	56.3	77.2	29.3	65.9
Outside Area	2.2	32.7	15.8	53.2	16.8

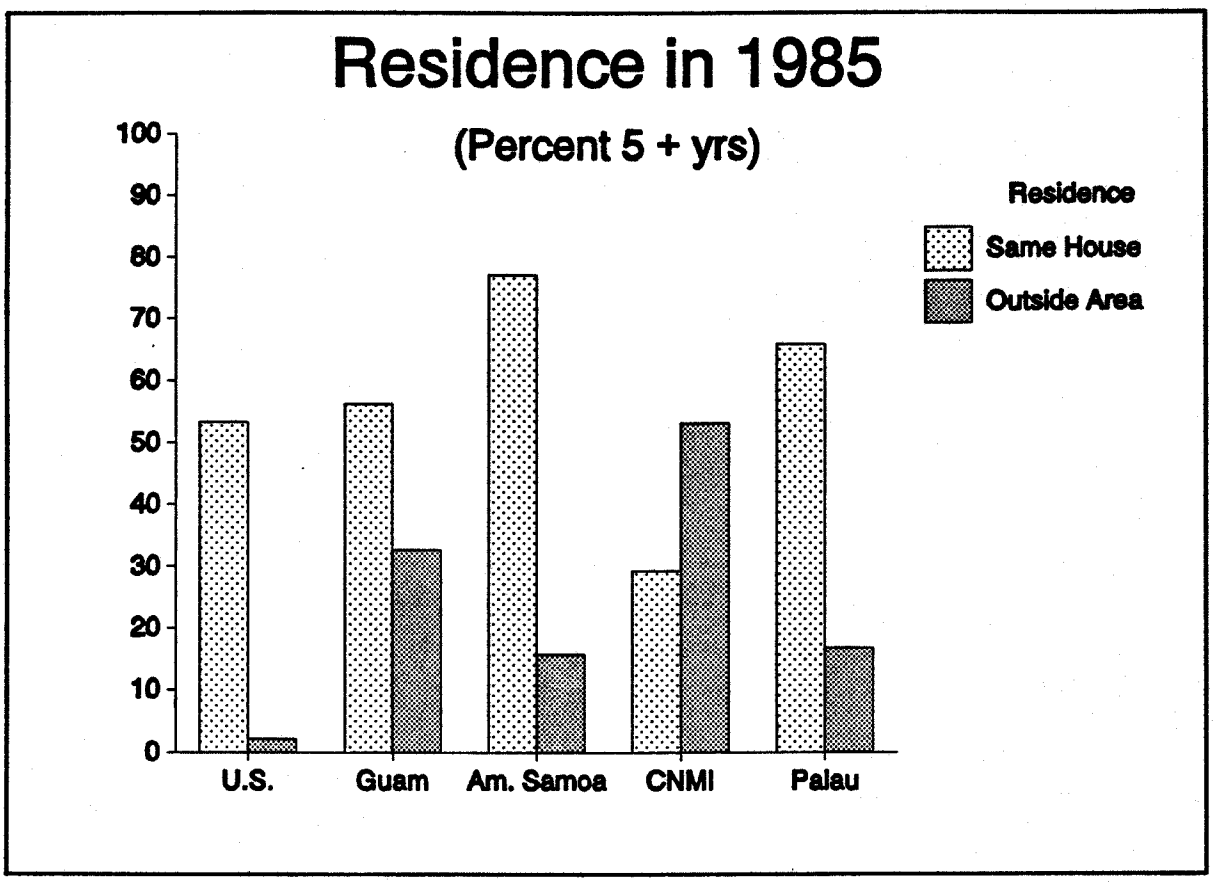
Sources: 1990 (Table 11, CPH)

The Pacific Islands areas showed considerable variation for this item. For Guam, with its large military and migrant populations, the percentage living in the same house was somewhat less than for the U.S., but about 1/3rd of all the persons over 5 living on Guam in 1990 actually lived outside Guam in 1985. The rest -- about 21 percent -- lived in another house on Guam in 1985.

At the other extreme, more than 3/4ths of American Samoa's population lived in the same house in 1985 as 1990, but only 1 in 6 lived outside American Samoa in 1985 but inside in 1990. About 2/3rds of Palau's population lived in the same house at both points in time, and, again, about 1 in 6 lived outside Palau in 1985.

For the CNMI, the largest percentage -- 53 percent -- lived outside CNMI in 1985, but had moved to CNMI by 1990, meaning that more than half of CNMI's resident population in 1990 had moved there within the 5 years before the census, pretty astounding even given the special case of CNMI and its out-armed attitude toward the immigrants. Less than 3 in every 10 persons lived in the same house in 1985 as 1990.

Speak a Language Other Than English at Home. The percentage of persons 5 years old and over in the United States who spoke a language other than English at home in 1990 was 14 percent, up from 11 percent in 1980, due to increased immigration during the decade (Table 11).



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Table 11. Percent Persons 5 and Over Speaking a Language Other than English at Home: 1980 and 1990

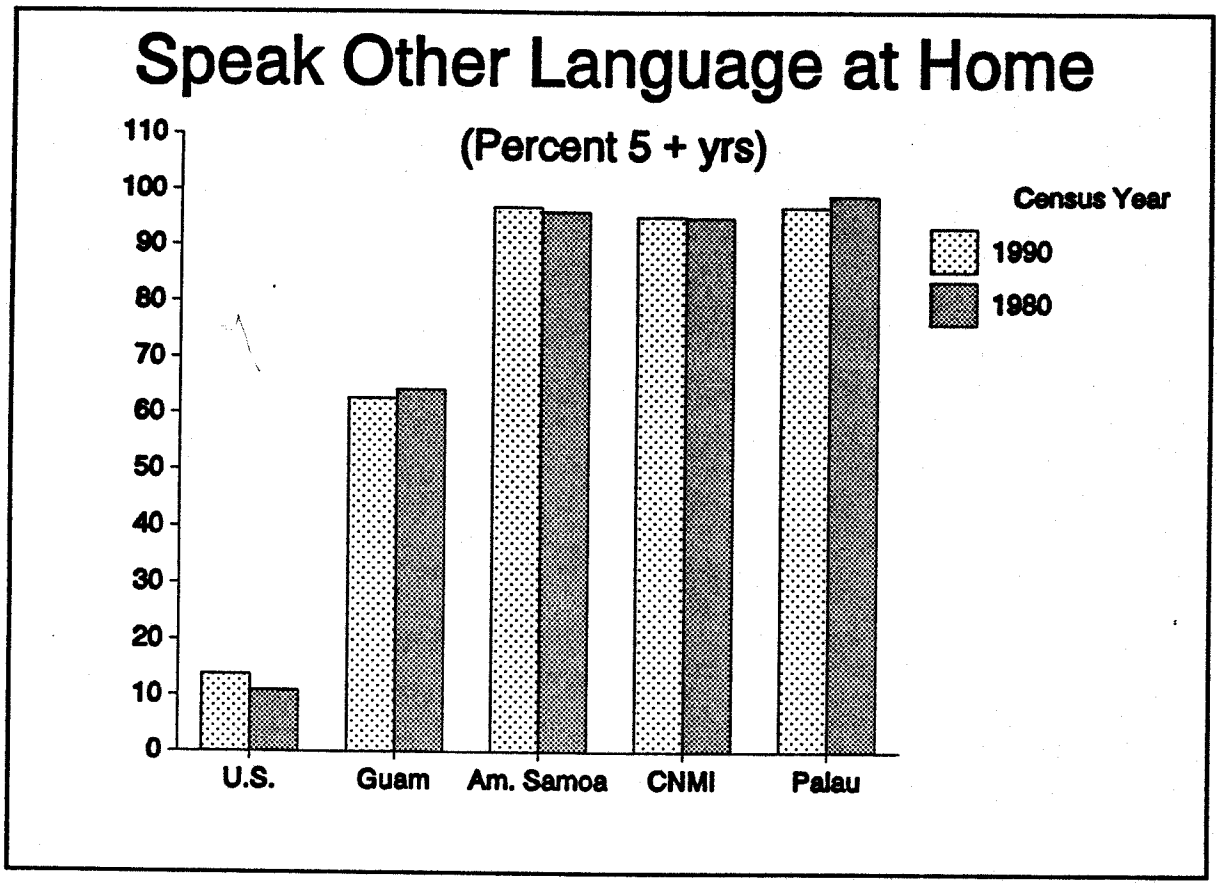
Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	13.8	62.7	97.0	95.2	97.0
1980.....	11.0	64.3	96.1	95.0	99.0

Sources: 1990 (table 12, CPH), 1980, PC80-1-C/D, table 21.

US 1980 PC80-1-C1, Table 99

Guam had the lowest percentages speaking a language other than English in both 1980 and 1990, the percentage decreasing from 64 to 63 percent during the decade. Less than 5 percent of the people 5 years and over in the other areas spoke English at home.

Frequency of Language Use. The United States did not have a question on frequency of English use for non English speakers, not this question appeared on the Pacific Islands forms in both



1980 and 1990.

In 1990 almost 94 percent of Palau's population 5 years and over and NOT speaking English, spoke the non-English language (in most cases Palauan) more than English at home, with only smaller numbers speaking English the same, or the other language less than English, or not speaking English at all (although this last figure may be suspect)(Table 12).

Table 12. Percent Persons 5 and Over Speaking a Language Other than English at Home More Frequently than English: 1980 and 1990

Year	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	35.6	86.0	65.4	93.8
1980.....	40.1	87.6	87.1	85.6

Sources: 1990 C table 12, CPH), 1980, PC80-1-C/D, table 29

Similarly, 86 percent of the residents of American Samoa who did not speak English, spoke the other language (usually Samoan) more than English, and another 9 percent spoke English and the other language about equally often.

CNMI was next, with about 65 percent speaking the other language (usually Chamorro or an Asian language) more frequently than English, and another 17 percent speaking English and the other language equally often.

Finally, Guam, with its large number of bilingual speakers looked least like the other Pacific areas. About 36 percent of Guam's population not speaking English at home, spoke the other language more than English at home, and another 36 percent spoke both languages equally often. Another 27 percent spoke English more than the other language, and less than 2 percent did not speak English at all.

Educational Attainment. About 3 in every 4 persons 25 years old and over in the United States in 1990 were high school graduates, up from 2 in every 3 in 1980 (Table 13). The percentages for Guam slightly lower in each census year. The other areas had much lower high school graduation rates in both years than Guam, but each experienced large increases over the decade. The CNMI went from 45 percent high school graduates to 66 percent during the decade, and American Samoa increased from 42 percent in 1980 to 54 percent in 1990. But Palau had the biggest increase, from 34 percent in 1980 to 58 percent in 1990, and increase of 24 percentage points.

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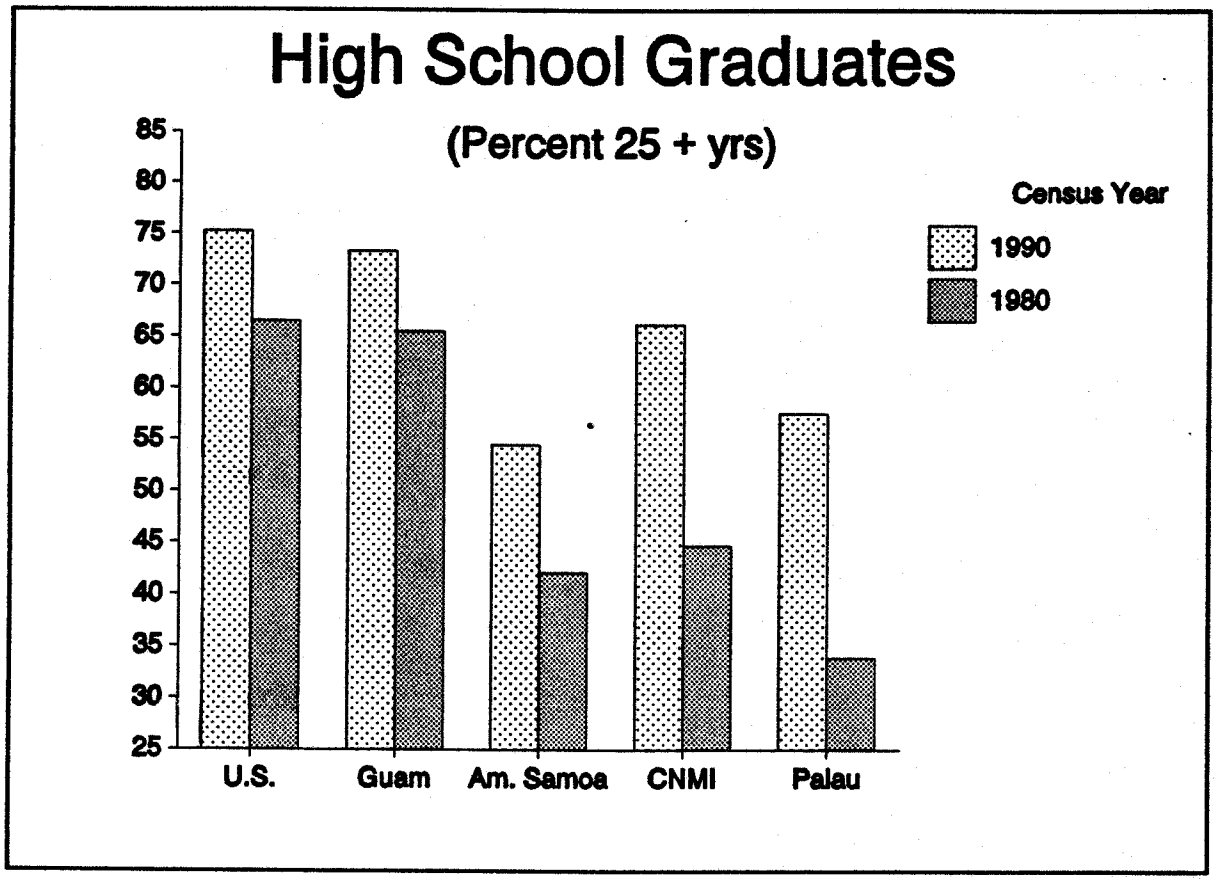
US 1980 - PC80-1-C1, table 102

Table 13. Percent Persons 25 and Over Who Are High School Graduates: 1980 and 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	75.2	73.3	54.5	66.3	57.6
1980.....	66.5	65.6	42.1	44.7	33.9

Sources: 1990 (table 13, CPH, 1980, PC80-1-C/D, table 27 or 35.

The percent of college graduates ages 25 years and over in the United States increased from 16 percent to 20 percent during the decade (Table 14). (The 1980 data were collected in terms of number of years in school, making them not completely comparable with the 1990 data which collected highest degree obtained.) The percent of college graduates on Guam did not change over the decade. However, the college graduates increased from 11 percent to 16 percent of CNMI's adult population, and 5 to 10 percent in Palau. The percentage of college graduates in American Samoa decreased slightly during the decade, probably because of migration flow -- more educated Samoans going to Hawaii and the U.S. mainland for jobs (or, because of the



continuing influx migrants, it is possible that the rate of college graduates could go down without the number decreasing.)

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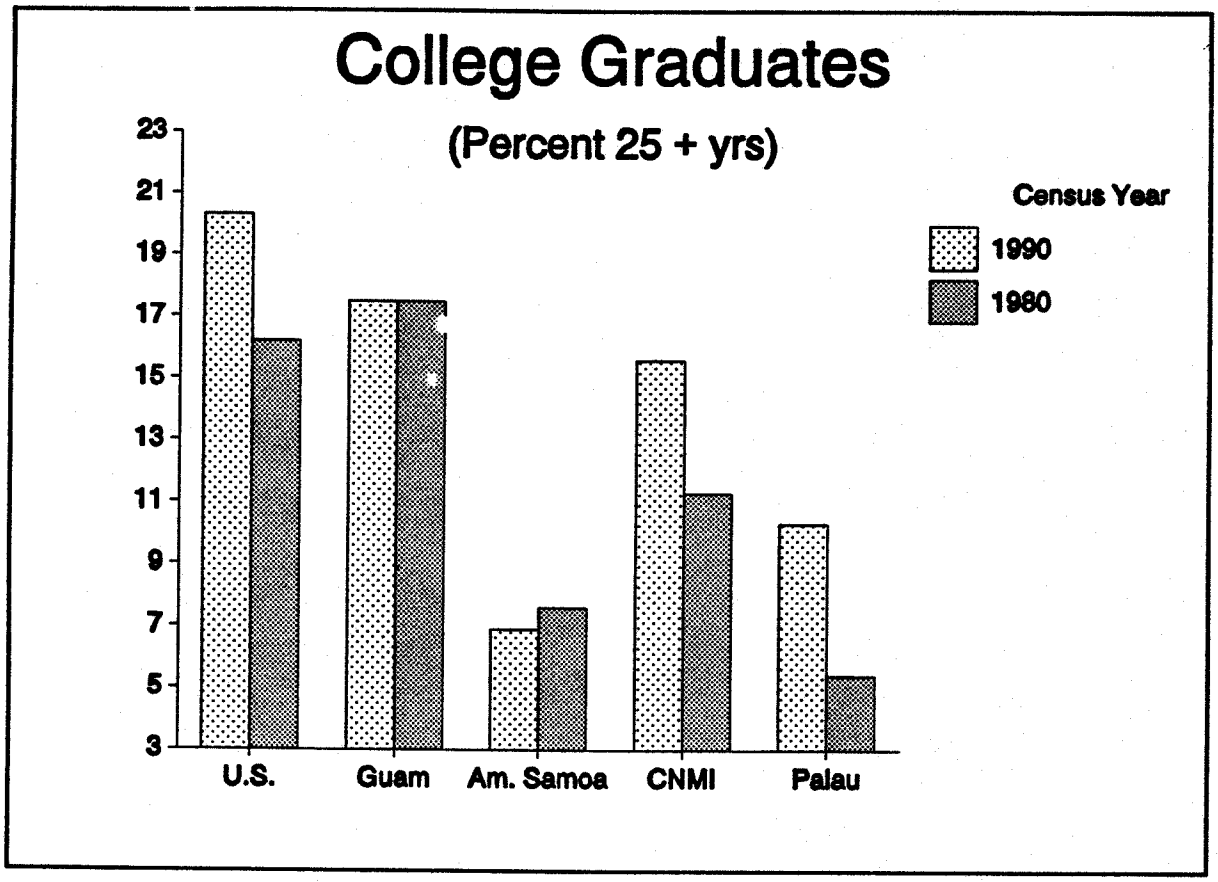
Table 14. Percent Persons 25 and Over Who Are College Graduates: 1980 and 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	20.3	17.5	6.9	15.6	10.3
1980.....	16.2	17.5	7.6	11.3	5.4

Sources: 1990 (Table 13, CPH), 1980 PC80-1-C/D, Table 35.

US 1980- PC80-1-C1,) Table 102

Vocational Training. The 1990 Census in the United States did not collect information on vocational training. The item was collected, however, in both 1980 and 1990 in the Pacific



Islands. The percentage of persons 16 to 64 who completed a vocational training program in Guam, remained about the same, at 26 percent (Table 15). The percentages in CNMI and Palau increased, probably because of vocational training among the immigrants, particularly those from Asia. The percentage with vocational training in American Samoa decreased, possibly because many with this training may have left from jobs in Hawaii and the U.S. mainland.

Table 15. Percent Persons 16 to 64 Years Completed Requirements for a Vocational Training Program: 1980 and 1990

Year	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	26.0	6.5	21.1	19.7
1980.....	26.1	10.5	18.5	16.8

Sources: 1990 (table 13, CPH, 1980; PC80-1-C/0, table 22.

ECONOMIC CHARACTERISTICS

Labor Force Participation. Labor force participation depends on the current economic situation at the time of the census. However, even with these snapshots, general trends can be seen. The overall labor force participation of persons 16 years and over during the week before the census in the U.S. in 1990 was 65 percent, up from 62 percent in 1980 (Table 16). All of the Pacific Islands areas also experienced increases in labor force participation rates during the decade.

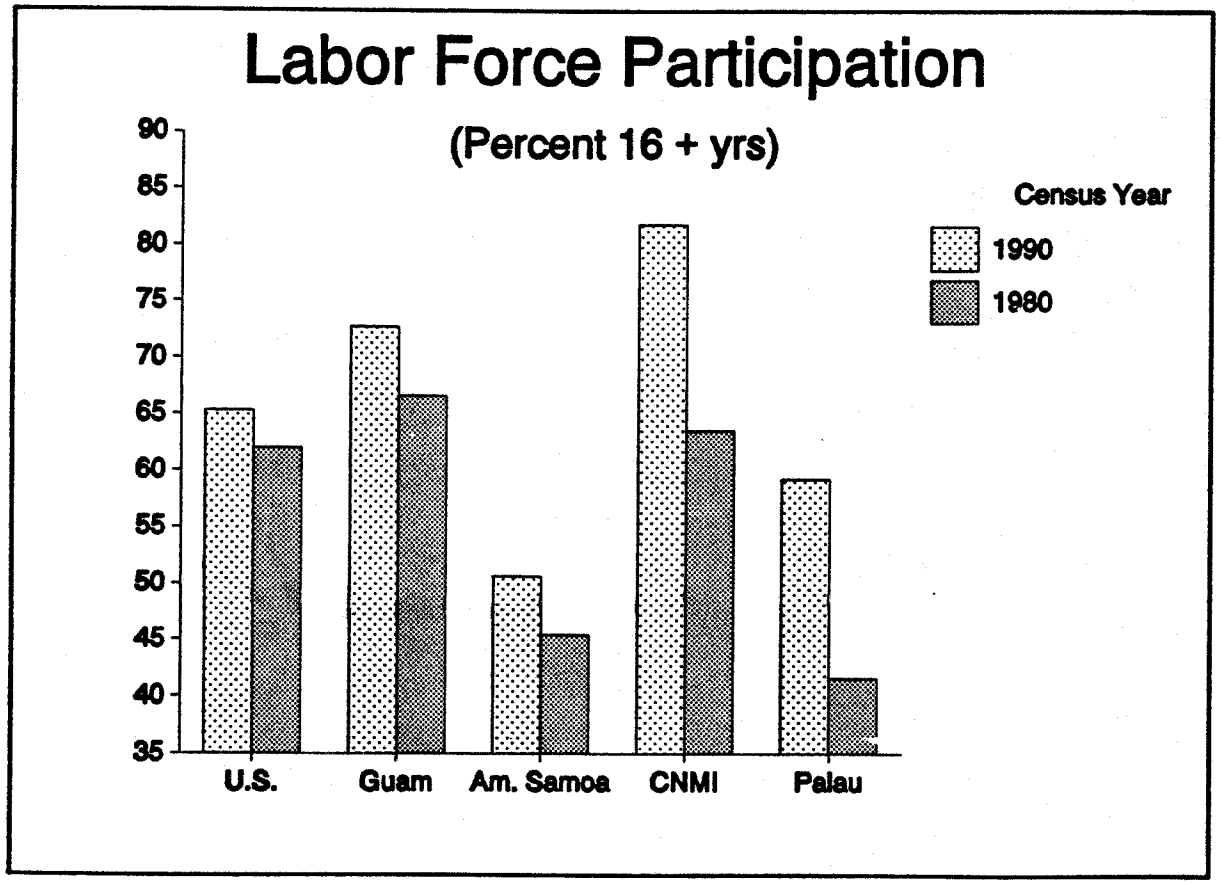
1990 Press Release CB92-87

US 1980 PC80-1-C1, table 103

Table 16. Percent Persons 16 and Over In the Labor Force: 1980 and 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	65.3	72.7	50.7	81.8	59.3
1980.....	62.0	66.6	45.5	63.6	41.6

Sources: 1990 (-table 15, CPH), 1980, PC80-1-C/D, table 23.



The CNMI experienced by far the largest increase -- from 64 percent in 1980 to 82 percent in 1990 -- partially because of the emerging private sector, with virtually full employment, almost anyone wanting a job would be able to have one. The very large immigrant population was almost completely employed, since they could not stay in the CNMI if they were not employed.

The labor force participation on Guam increased from 67 percent to 73 percent during the decade, higher than the rate for the U.S. because of the large number of alien workers in construction, tourism, and related activities, and, perhaps because of the presence of the military.

American Samoa and Palau had lower, but improving rates of labor force participation. American Samoa's rate increased from 46 percent to 51 percent, and Palau's from 42 percent to more than 59 percent.

The labor force participation of males in the United States decreased slightly during the decade, while female labor force participation increased considerably. This improvement in female labor force participation was seen in all of the territories as well -- with American Samoa increasing by 7 percentage points, Guam by 10, Palau by 18, and CNMI by 28 points (Table 17). More than 3 out of every 4 adult females in the CNMI in 1990 were in the labor force.

Table 17. Percent Persons 16 Years and Over In the Labor Force by Sex: 1980 and 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
Males:					
1990.....	74.4	83.8	58.8	87.4	68.3
1980.....	75.1	82.2	55.6	77.1	52.6
Females:					
1990.....	56.8	59.5	42.4	75.3	48.4
1980.....	49.9	49.2	35.5	47.6	29.7

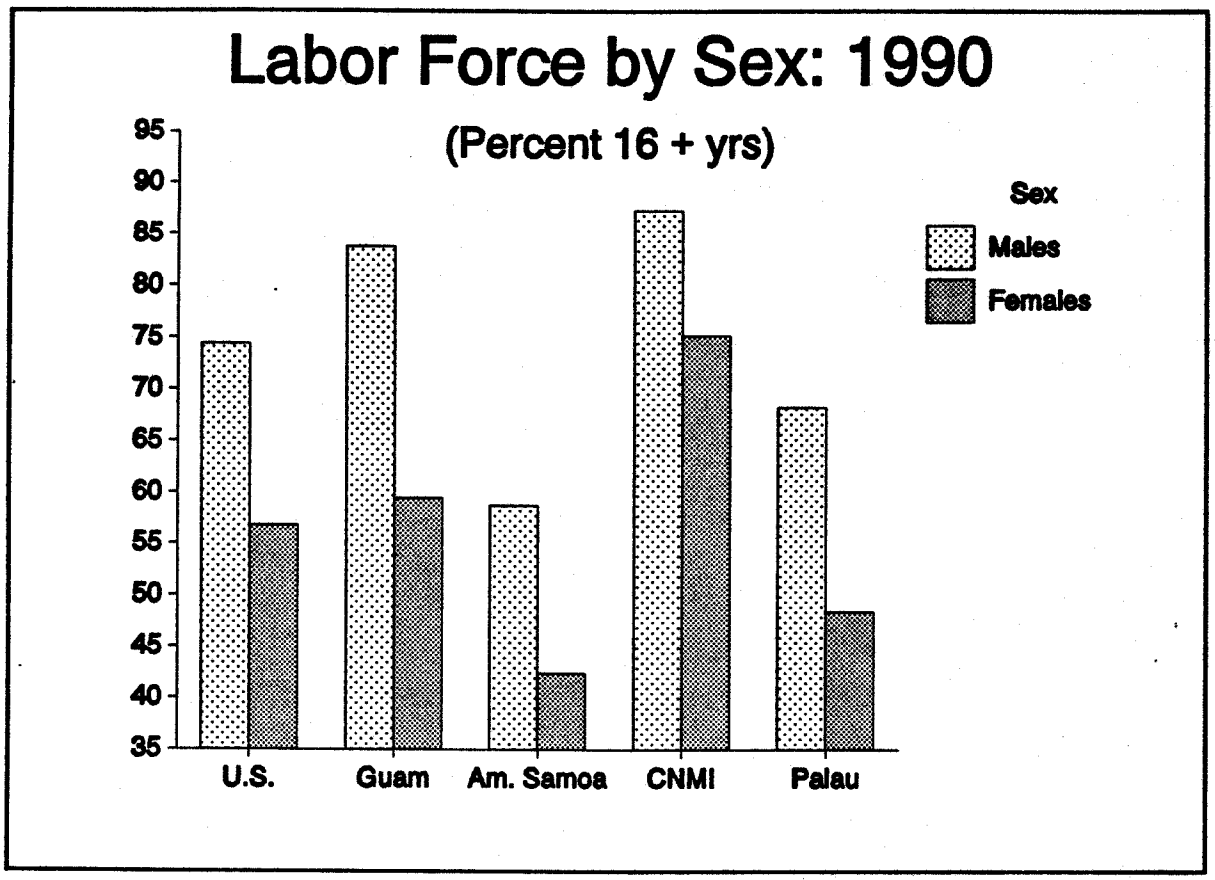
Sources: 1990 (Table 15, CPH), 1980, PC80-1-C/D, Table 23.

1990 Press Release CB92-87

US 1980. PC80-1-C1, Table 103

The percentage of CNMI males in the labor force was even greater -- almost 7 out of every 8 adult males was in the labor force (compared to 3 of 4 in the U.S.). Much of this elevated employment has to do with the very large number of immigrants who must be working to legally remain in the CNMI. Guam's male labor force rate was also very high, and had increased since 1980. Both American Samoa and Palau saw increased rates for males as well.

Class of Worker. The percentage of private sector workers in the United States increased slightly between 1980 and 1990, from less than 76 percent to more than 77 percent (Table 18).



The only Pacific area with a larger percentage in the private sector in 1990 was the CNMI at 85 percent, up from 56 percent in 1980. Palau also experienced an enormous increase, from 37 percent to 59 percent between 1980 and 1990 -- hence while almost 4 in every 10 workers in 1980 worked in the private sector in 1980, the reverse was true in 1990 -- almost 4 in every 10 did not work for the private sector in 1990.

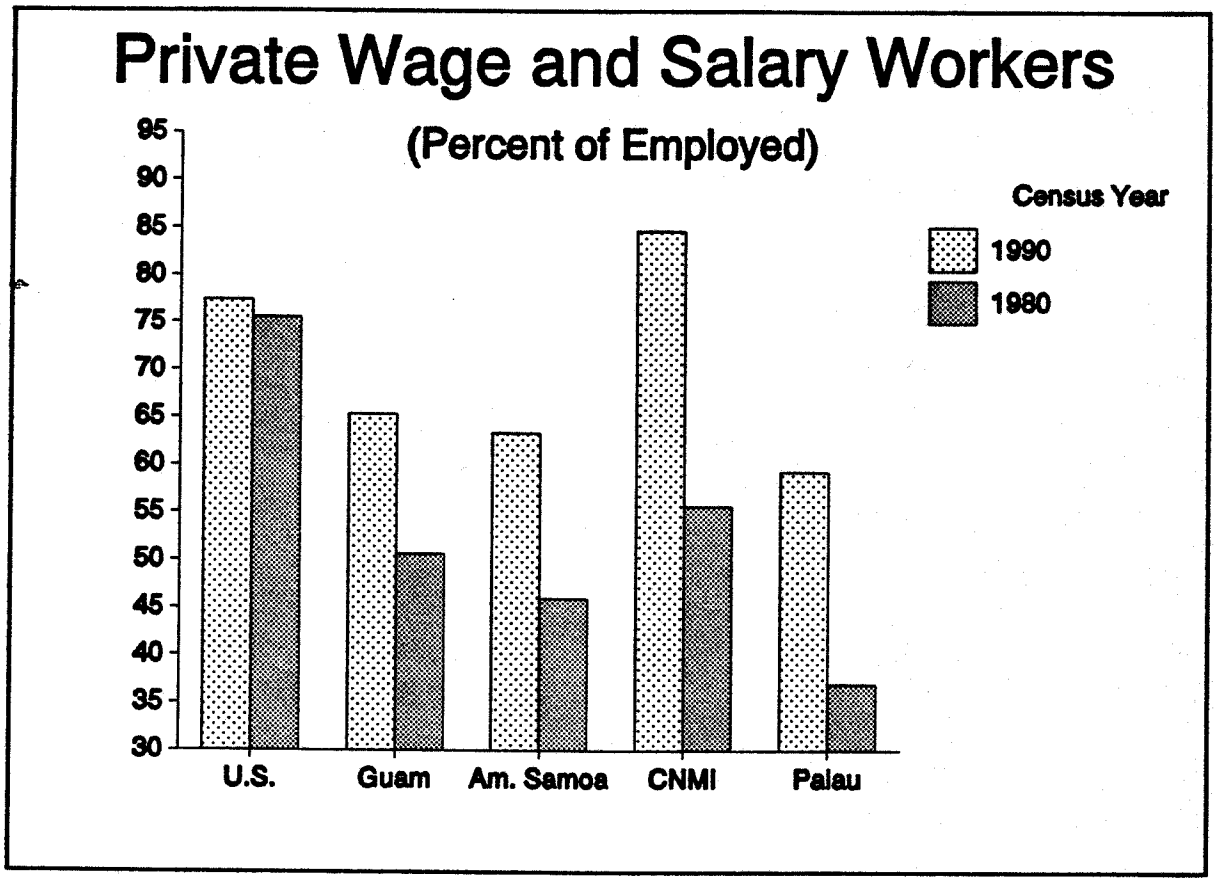
1990 Press Release CB92-87

US 1980 PC80-1-C1, Table 103

Table 18. Percent Employed 16 Years and Over Private Wage and Salary Workers: 1980 and 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	77.4	65.3	63.4	84.8	59.3
1980.....	75.6	50.7	46.0	55.7	37.0

Sources: 1990 (Table 16, CPH), 1980 PC80-1-C/D, Table 23.



The percentage of private sector employment on Guam increased from 51 percent to 65 percent during the decade, and in American Samoa from 46 to 63 percent.

Industry. About 23 percent of the employed persons 16 years and over in the United States were working in professional and related services in 1990, a larger percentage than in any of the Pacific Islands areas (Table 19). Palau had the highest proportion in these industries of the Pacific areas, at 18.7 percent, although the 18.2 percent for American Samoa was only slightly less. About 17 percent of the employed on Guam were in this category, but only 8 percent of those in the CNMI.

US 1990 Press Release CB92-87

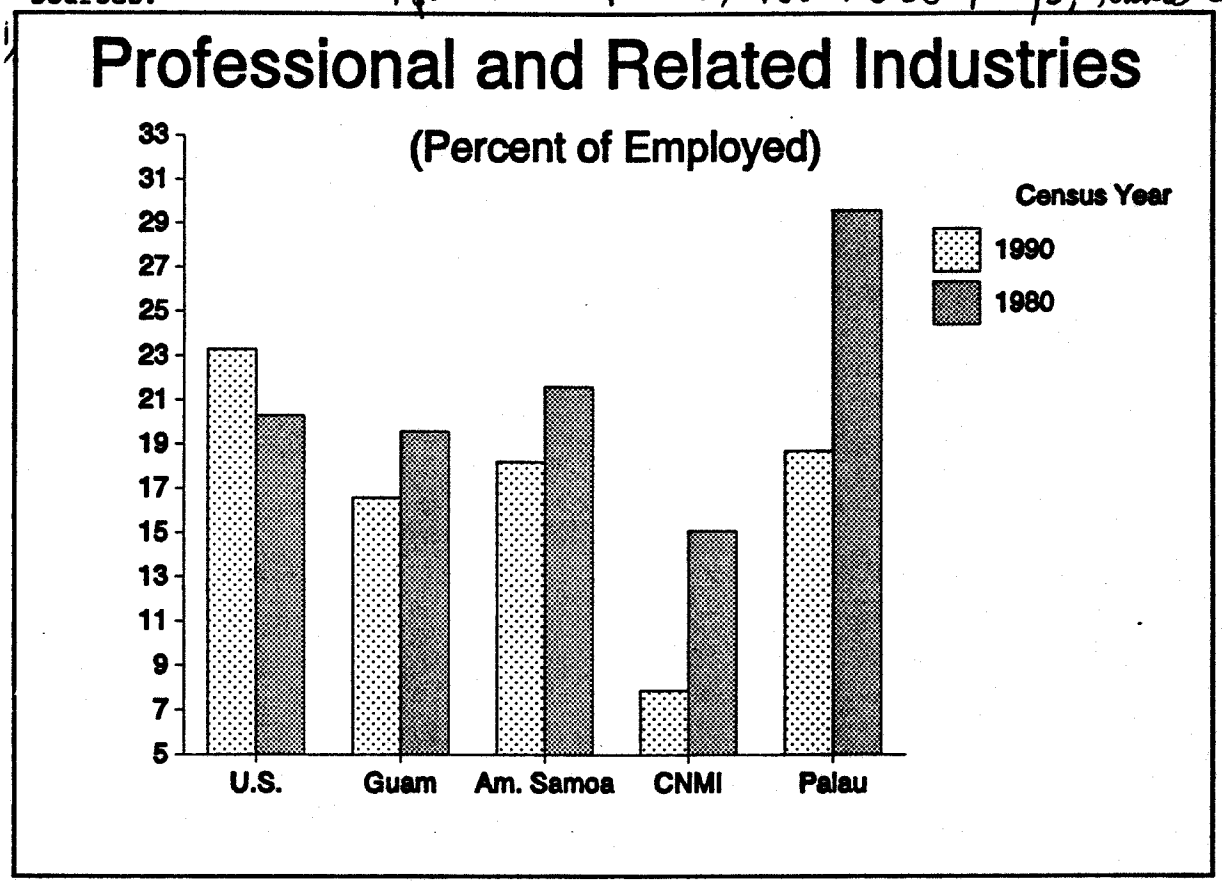
US 1980

PC80-1-C, table 105

Table 19. Percent Employed 16 Years and Over in Professional and Related Service Industries: 1980 and 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	23.3	16.6	18.2	7.9	18.7
1980.....	20.3	19.6	21.6	15.1	29.6

Sources: 1990 (table 17 CPH), 1980-PC80-1-C10, table 23



The percentage of employed professionals and related service industry persons increased from 20 to 23 percent in the United States during the decade. None of the Pacific areas had similar increases -- in fact all decreased -- mostly because of diversification in the Pacific Islands' economies, particularly the movement from the public sector to the private sector. In the CNMI, the percentage in this industry category decreased from 15 percent of the employed to 8 percent. Palau had a decrease of 12 percentage points.

On the other hand, in 1990, while 17 percent of the employed in the United States worked at retail trade, 19 percent of those in Guam were in this category, as were 12 percent of those in Palau and CNMI, and 11 percent of those in American Samoa (Table 20).

US 1990 Press Release CB 92-87

Table 20. Percent Employed 16 Years and Over in Retail Trade Industries: 1980 and 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
1990.....	16.8	19.1	10.8	11.9	12.0
1980.....	16.1	20.0	9.6	13.8	8.1

Sources: 1990 (Table 17, CPH), 1980 PC 80-1-C1, Table 23

US 1980 PC80-1-C1, Table 105

The U.S. percentage in retail trade increased slightly during the decade, from 16.1 to 16.8 percent. The percentage for American Samoa increased slightly while the percentages for Guam and the CNMI decreased somewhat. The percentage for Palau, however, increased by 50 percent, from 8 percent of the employed to 12 percent.

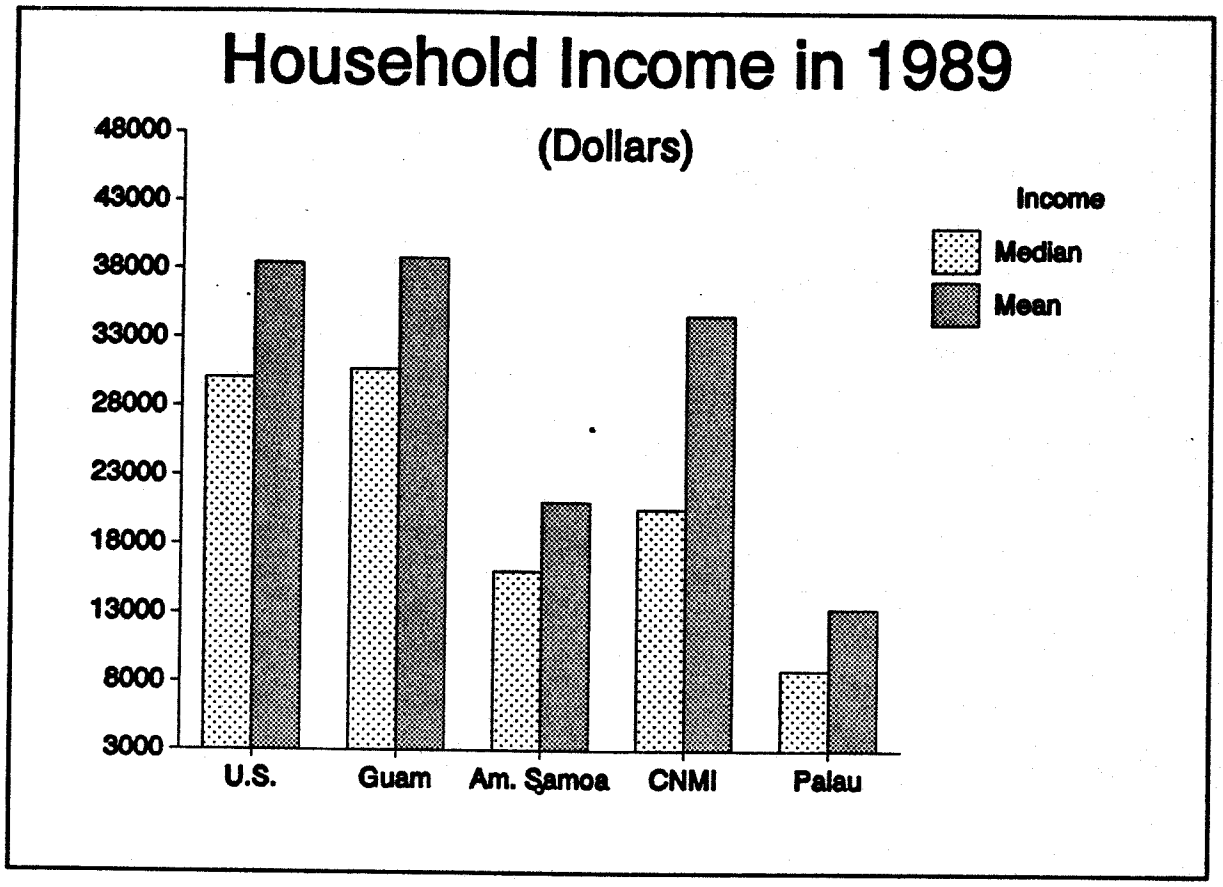
Household Income. The median household income in the United States in 1989 based on the 1990 census was $30,056 (Table 21). Again, the median is the value which divides household income in half -- half the households in the United States had incomes above $30,056, half had incomes below. The median for Guam was slightly higher at $30,755. But the median incomes for the other Pacific areas lagged behind Guam, considerably. The median household income in the CNMI was $20,644 in 1989, followed by American Samoa at $16,114, with Palau, at $8,882 the lowest of all, less than one-third that of the U.S. or Guam.

Table 21. Median and Mean Household Income in 1989: 1990

Year	United States	Guam	American Samoa	Northern Mariana Islands	Palau
Median.....	$30,056	$30,755	$16,114	$20,644	$8,882
Mean.....	$38,453	$38,873	$21,146	$34,713	$13,395

Sources: 1990 (Table 19, CPH)

Table 21 also shows mean household incomes for the United States and the areas. The mean income for the United States, for example, is the sum of all the income (from all sources, earned and unearned) from all the households in the United States *divided by* the sum of all the households in the United States. Since the mean includes all the income, it takes into account "outliers", so is more susceptible than the median to cases which are most aberrant -- either much higher or much lower than average. In the case of the median household income for the



United States in 1989, the $38,453 value shows that many cases fell in the upper levels, increasing the mean somewhat above the median value.

The mean income for Guam was similar to the mean for the United States, the mean for CNMI was about $4,000 less than that of the U.S. or Guam, while American Samoa's mean was about $21,000, about $17,000 less than the U.S. mean, and Palau's was about $13,000, slightly more than one-third the value for the U.S.

DISCUSSION AND CONCLUSIONS

These data show the enormous changes ongoing in the United States Pacific Islands areas. Since the decennial censuses, by definition, only occur every 10 years, the respective governments

must make efforts to obtain intercensal population and housing efforts to assist in planning and policy decisions. Until recently, few of the areas made these attempts.[1]

Intercensal data come primarily from two sources: special surveys and administrative records. Guam has recently developed a new sampling frame for its quarterly current labor force survey, but is still the only one of the Pacific areas to have a regularly intercensal survey. The Northern Mariana Islands took several labor force surveys in the mid-1980s, and was planning another for 1992. American Samoa took a Labor Force survey in 1985 and a Household Income and Expenditures Survey (HIES) in 1983. Palau took a HIES in 1991.[2] Guam plans a HIES for 1993.

All areas have reasonably good vital statistics -- the reporting of births and deaths. In most cases, though, rates are problematic, because of the large amount of migration, particularly into these areas. None of the areas collects complete entry and exit information, information needed to determine net migration (and, of course, net migration by age and sex is even more useful for planning purposes.) Guam is in the process of revising its method of collecting entry data, but has not yet developed the exit part of its program. The other areas also attempt to collect entry and exit data from immigration cards, but with varying success.

All the areas are experiencing migration problems of various types -- migration to Palau has increased rapidly in recent years, but unknown numbers of Palauans also continue to leave Palau, and since, in both cases, migration is selective by age and sex, planning for future economic growth, and social amenities such as schools, medical clinics, and recreational facilities, is made more difficult.

The other areas have these problems, but the added problem of flow through. Western Samoans and Tongans, for example, come from their home islands, and then go on to Hawaii and the U.S. mainland.[3] When they come, who they are, how long they stay -- the government of

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[1] For many years, the U.S. Bureau of the Census made yearly population estimates based on decennial census results, vital statistics obtained from the Pacific Islands governments, and estimates of migration, from various sources. The Bureau has made no post-1990 census estimates as yet, but is developing new methodologies to assist the Pacific Islands governments in this area.

[2]The Office of Territorial and International Affairs, Department of Interior generously funded this and other recent statistical work in the Pacific Islands areas.

[3]See Levin (1992) for a description of Pacific Islander migrants in the United States based on the 1980 and demographic data from the 1990 censuses.

American Samoa must address all of these planning issues.[4] Without adequate data, the issues will be that much harder to address. We also see this effect in Guam and the CNMI. The 1990 Census monograph for Palau, for example, includes a chapter on Palauans in Guam and the CNMI for comparative purposes. These data will serve the governments of receiving areas as well as the Republic of Palau's government.

Guam and the Northern Mariana Islands are also experiencing migration from the Federated States of Micronesia (FSM) persons who are entitled to relatively unrestricted entry to the United States and its territories under the terms of the Compact of Free Association with the United States, signed in 1986. As would be expected, a lag occurred after the signing of the Compact, but migration to Guam and the CNMI has accelerated in recent years, putting demands on the education, medical, recreational, and judicial systems in these areas. The government of Guam is currently taking a census of the FSM Micronesians on Guam. These data will assist in determining the impact of the Compact of Free Association, but will also provide additional data for general population dynamics on Guam. When the CNMI takes a similar census, it will also have additional data for planning.

[4]See Ahlburg and Levin, 1990, for a detailed analysis of this flow based on the 1980 Census of American Samoa and the United States.

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Levin, Michael J. (1992) "The Pacific Islanders" in *Asians and Pacific Islanders in the United States* by Herb Barringer, Robert Gardner and Michael Levin. New York: Russell Sage.

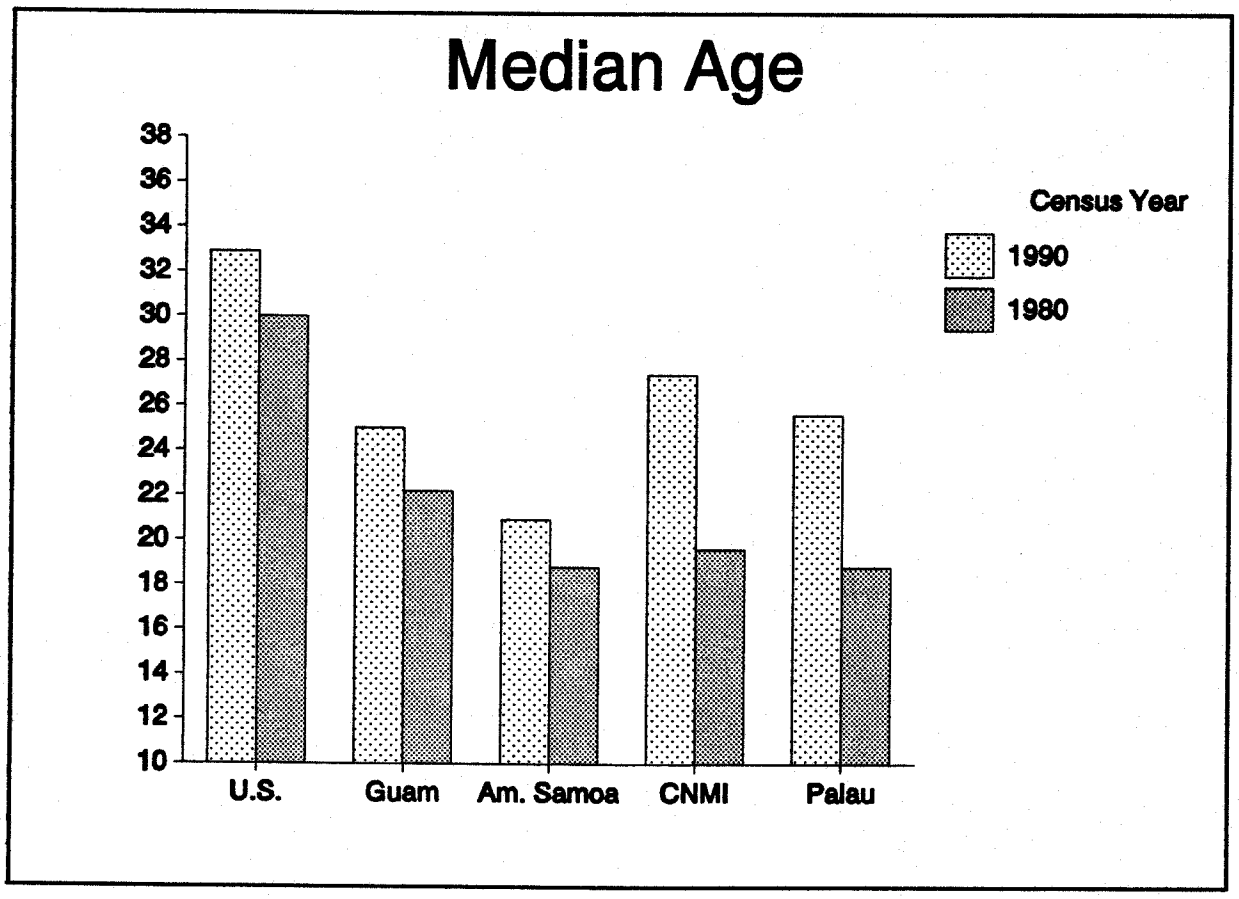
Levin, Michael J., Huan Hosei, and Larry Gorenflo (1993) *Report on the 1990 Census of Population and Housing*. Koror: Government of the Republic of Palau.

Demographic, Social and Economic Conditions in the U.S. Pacific Islands Based on the 1990 Census

GRAPHS AND DESCRIPTIONS

Michael Levin, Population Division

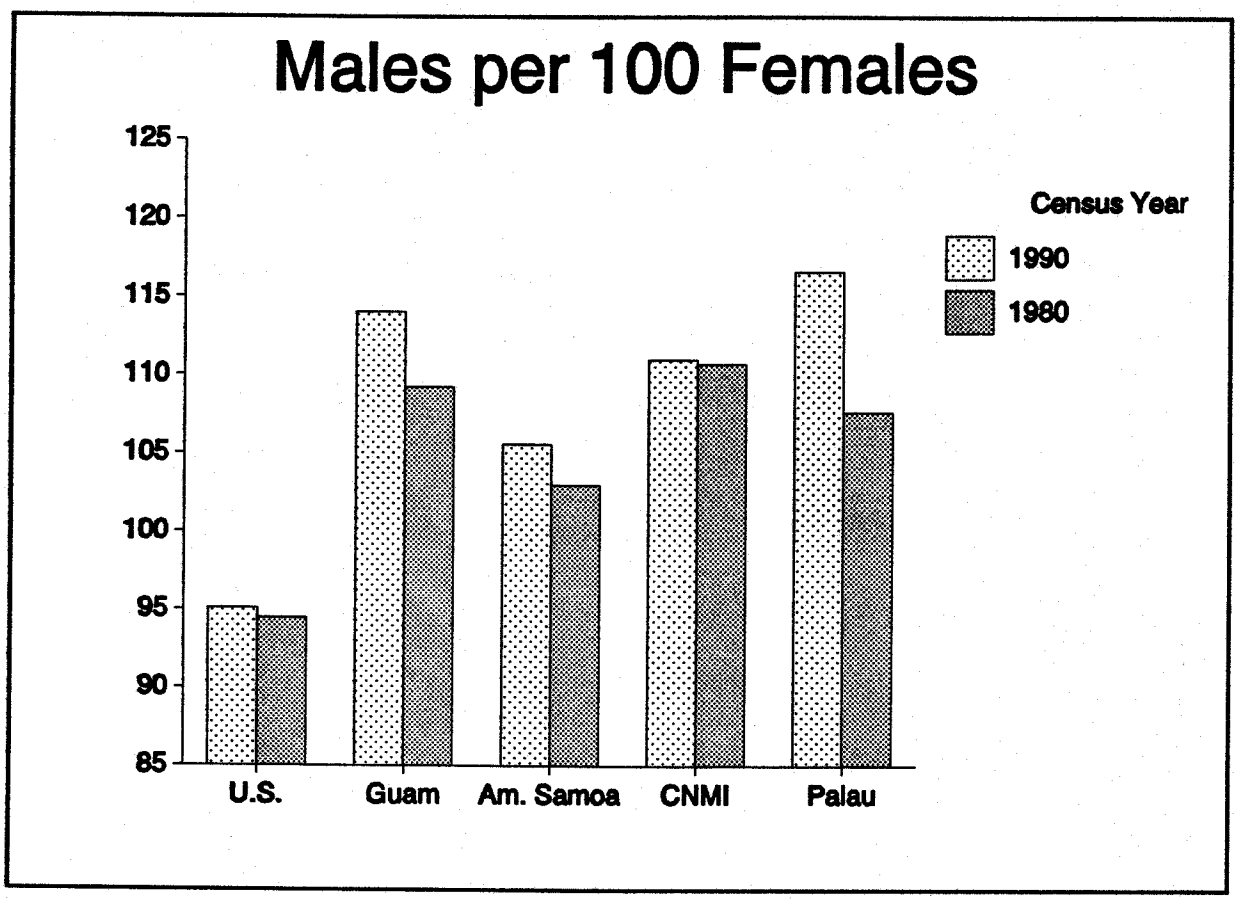
September, 1992



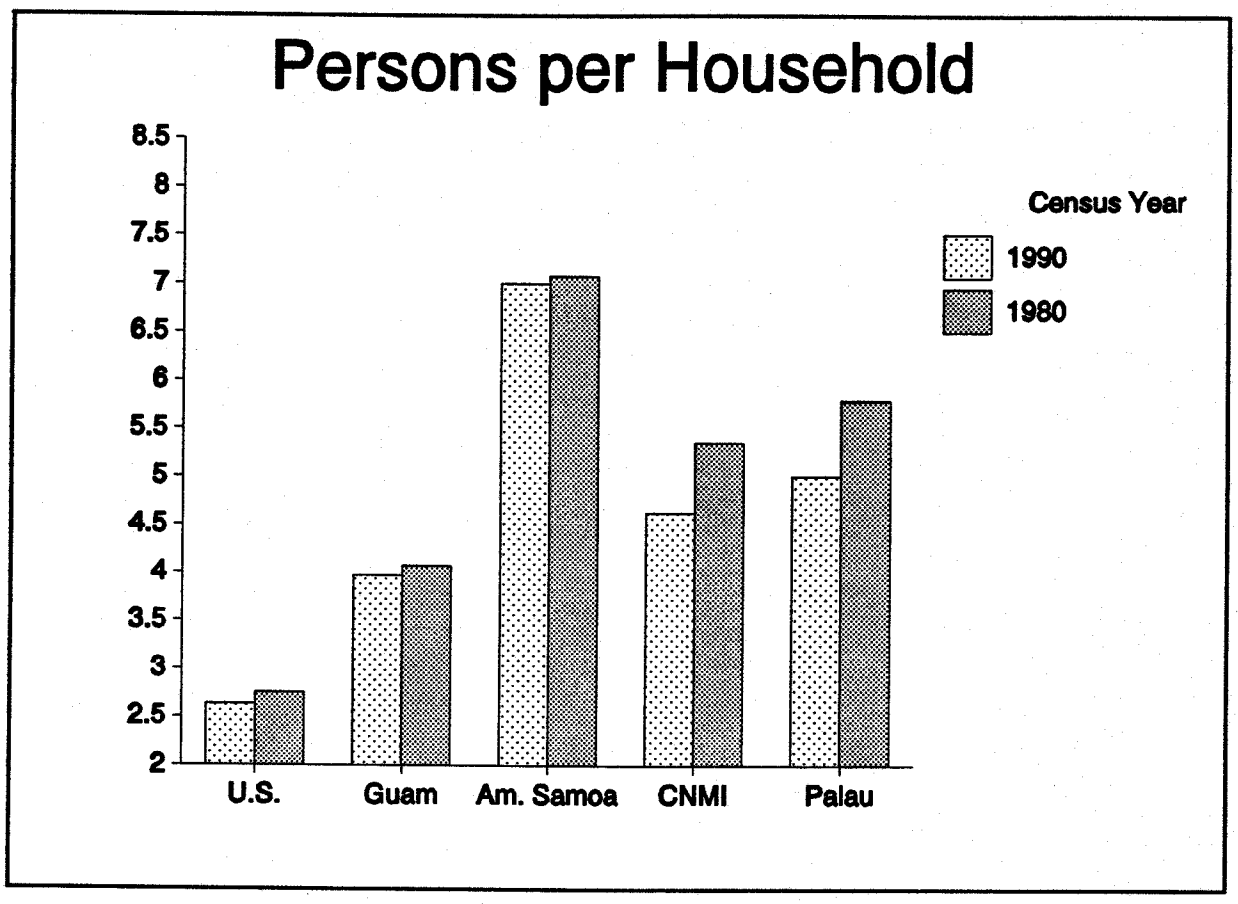
- **U.S. Median 32.9 years -- half older, half younger**
- **Median for all others is less**
- **American Samoa is lowest BECAUSE**
  - **Highest fertility**
  - **Lowest immigration of immigrants in middle ages**

SECOND FIGURE:

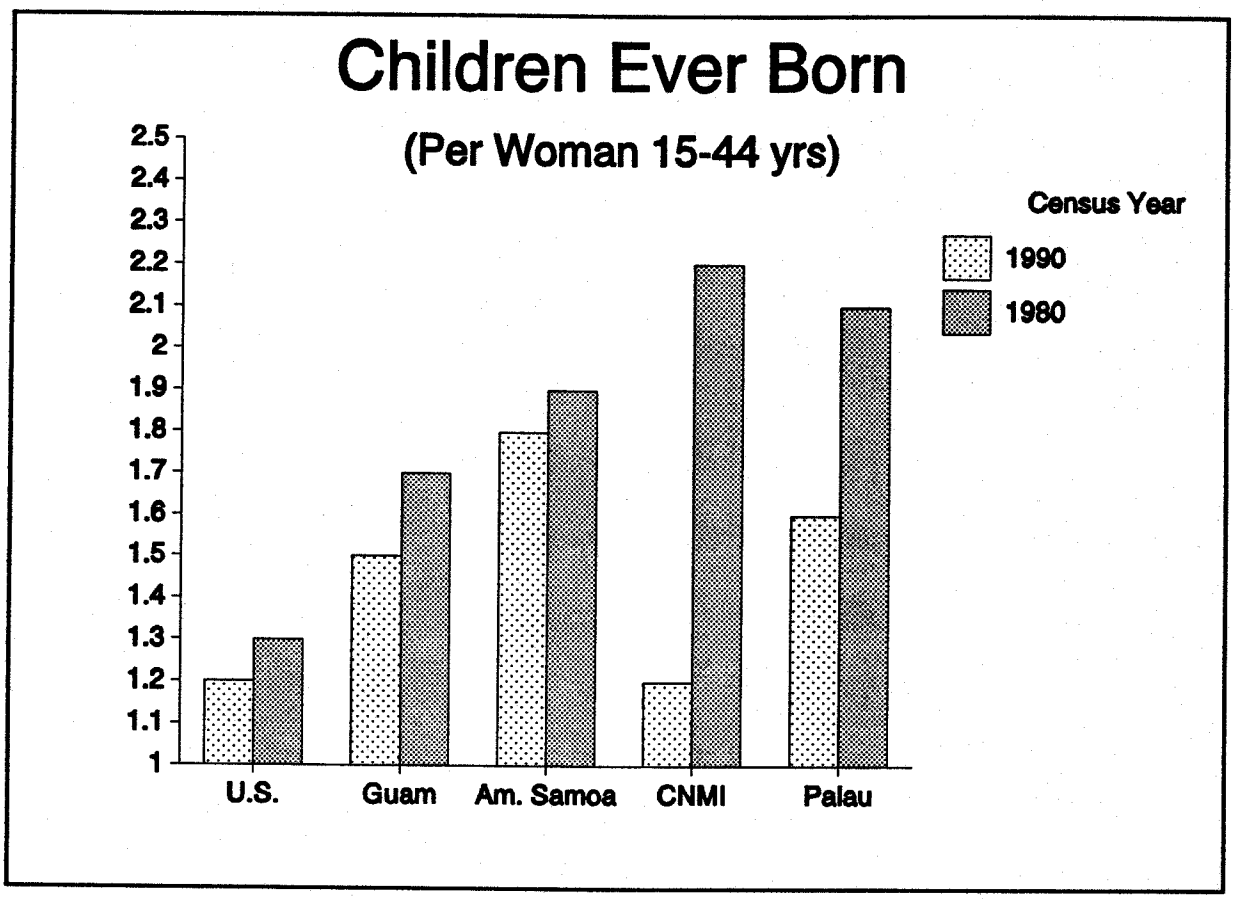
- **Median in U.S. is older for females than males**
- **NOT TRUE in Pacific Islands except for American Samoa**
- **Males much older in CNMI because of selective immigration**



- **More Females than Males in U.S.**
- **NOT TRUE in Pacific Islands**
- **Palau MOST skewed because of selective immigration**
- **Guam affected by MILITARY presence and immigration**
- **ALL Pacific areas are MORE male in 1990 than 1980**



- **American Samoa has MOST CROWDED households -- more than 7 people in each house**
- **Palau has 5 persons per household, followed by CNMI, and GUAM**
- **Guam has one person more on average than U.S.**
- **All areas except American Samoa had smaller households in 1990 than 1980 (SAME size in American Samoa)**
- **Fertility is decreasing**



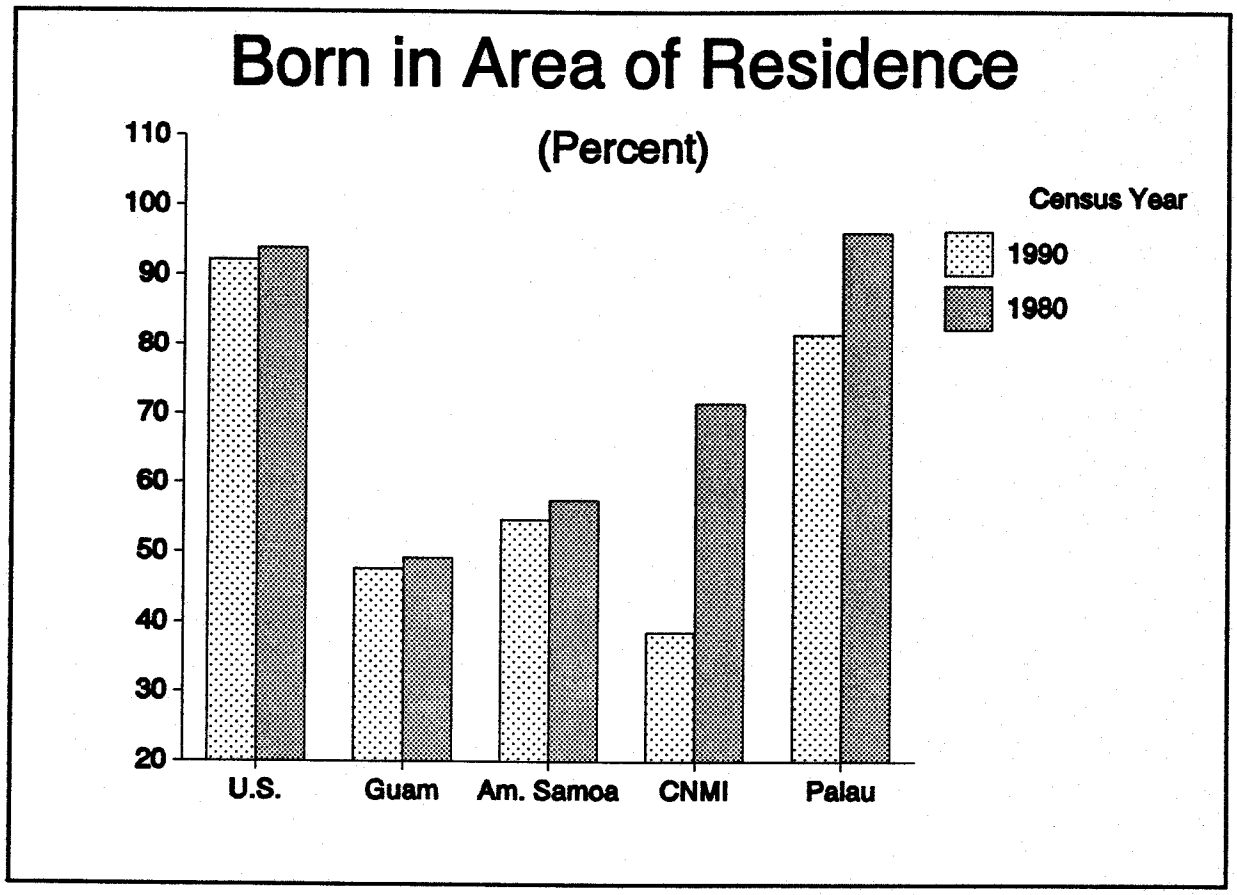
- **To get Children Per Woman, DIVIDE values by 1000**

- **These are WOMEN 15 to 44 YEARS <u>ONLY</u>**

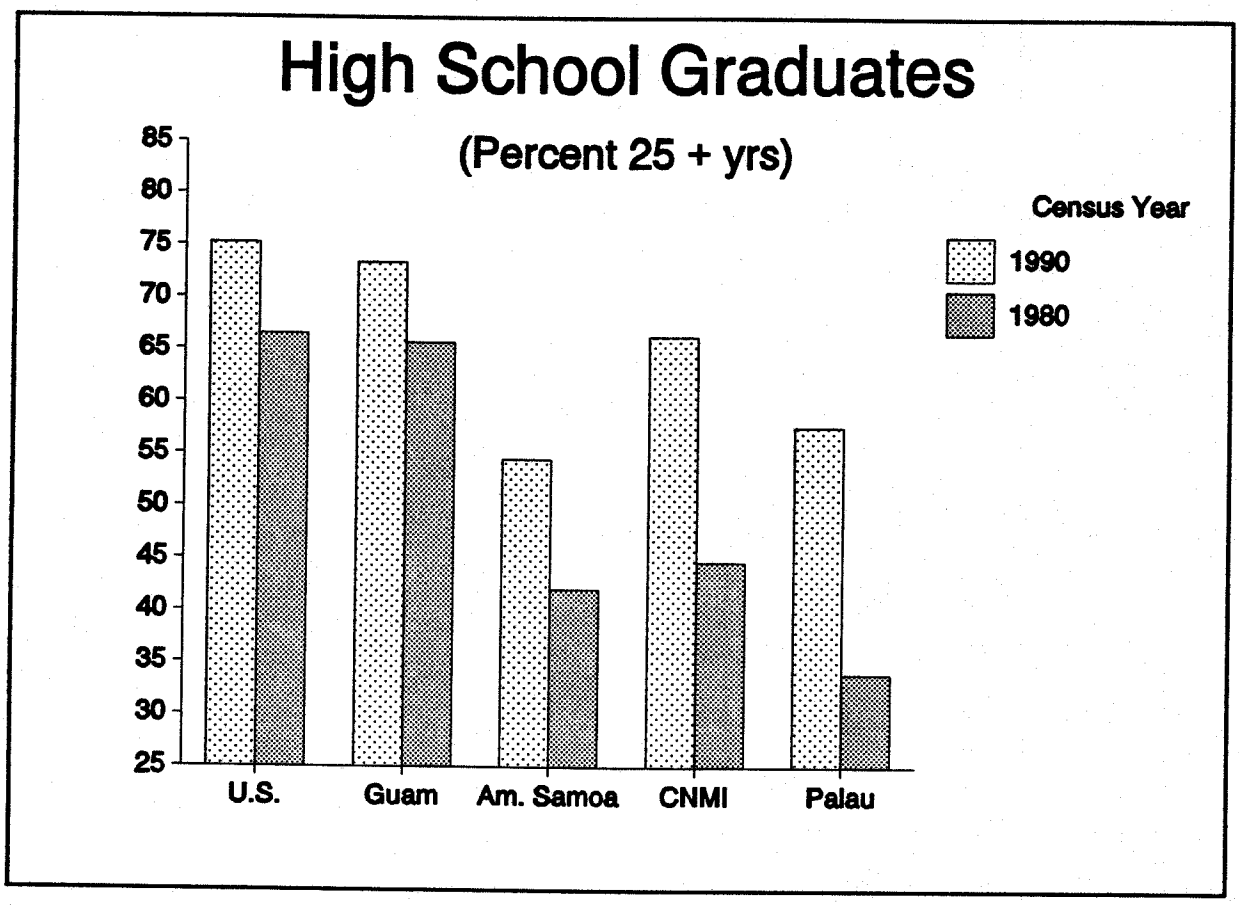
- **Fertility of CNMI women decreased on average by one child per woman during the decade**

- **In 1990, CNMI fertility about the same as US fertility. ALL others higher.**

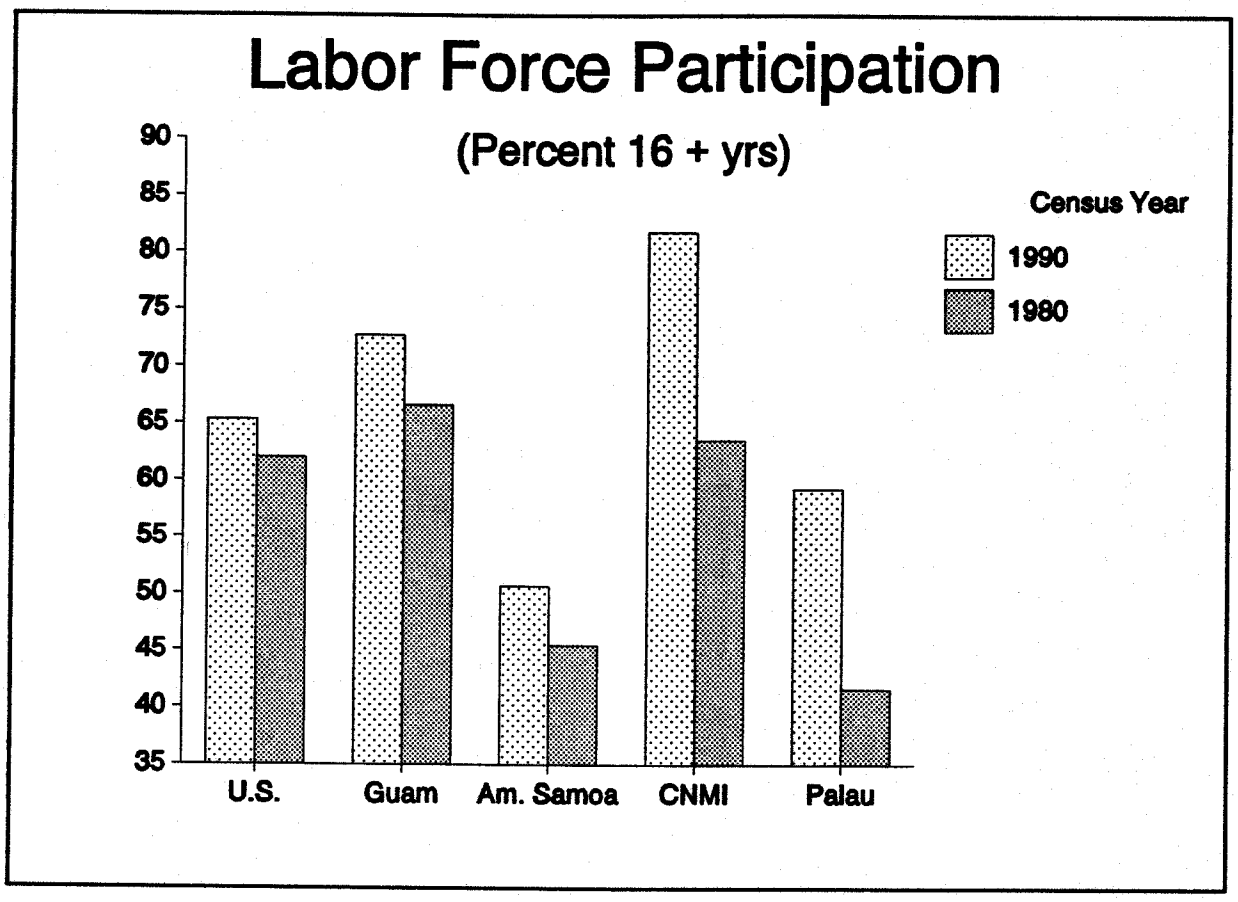
- **In 1990, American Samoa had highest fertility – 1.8 children per woman 15 to 44 years old**



- **In 1990, about 8 percent of US population born outside US**
- **All Pacific Islands Areas had larger percentage born outside**
- **Less than half of people living in Guam and CNMI born there.**
- **Percentage born in CNMI went from 72 percent in 1980 to only 39 percent in 1990**
- **Largest percentage born and living in area -- 82 percent for Palau**



- **NOTE THAT THIS TABLE IS FOR PERSONS 25 YEARS & OVER**
- **More than 3 out of every 4 adults in US are High School Graduates**
- **Almost 3 of 4 on Guam, 2 of 3 in CNMI, more than half for Palau and American Samoa**
- **All areas saw increased percentages of high school graduates between 1980 and 1990**
- **Palau had biggest increase in decade -- from 34 percent to 58 percent**



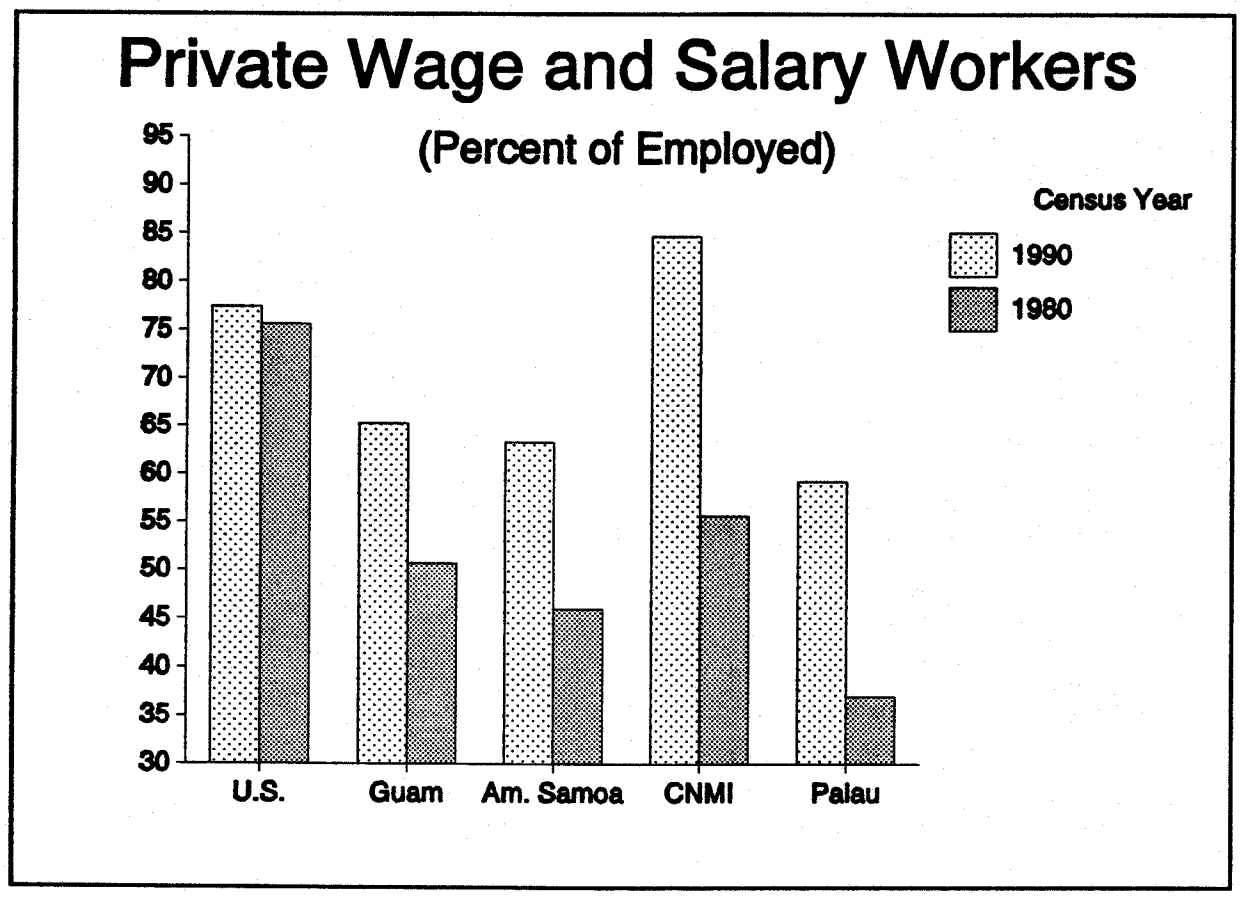
♦ **NOTE: Labor Force Participation can vary depending on current economic situation -- example: Typhoon Omar on Guam COULD affect rates around period of typhoon**

♦ **Refers to whether working in week before census enumeration**

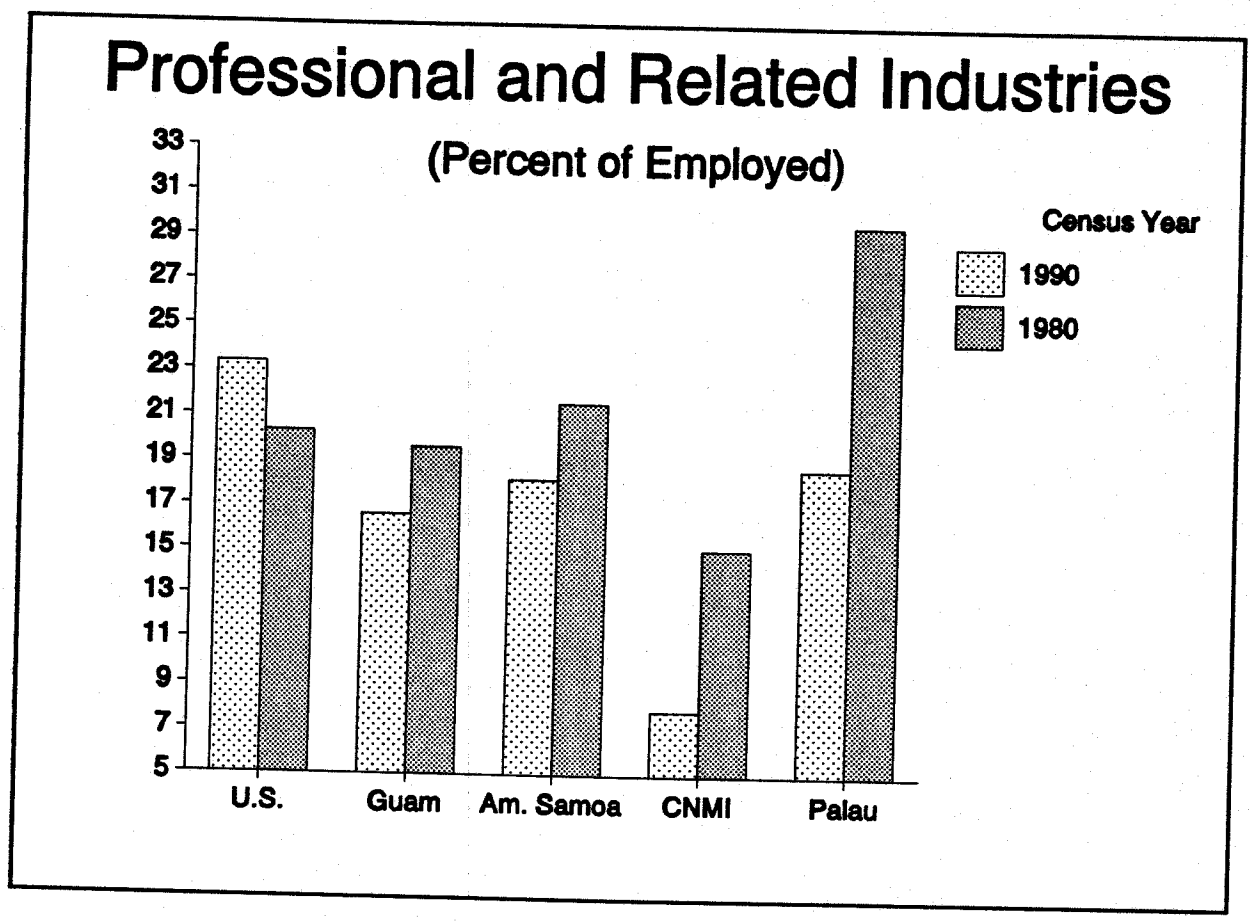
♦ **Highest -- 82 percent in CNMI because of immigration to work**
- **Many have to work to stay in CNMI**
- **Many work in garment and other factories**

♦ **CNMI and Palau both had greatly increased rates because of selective migration**

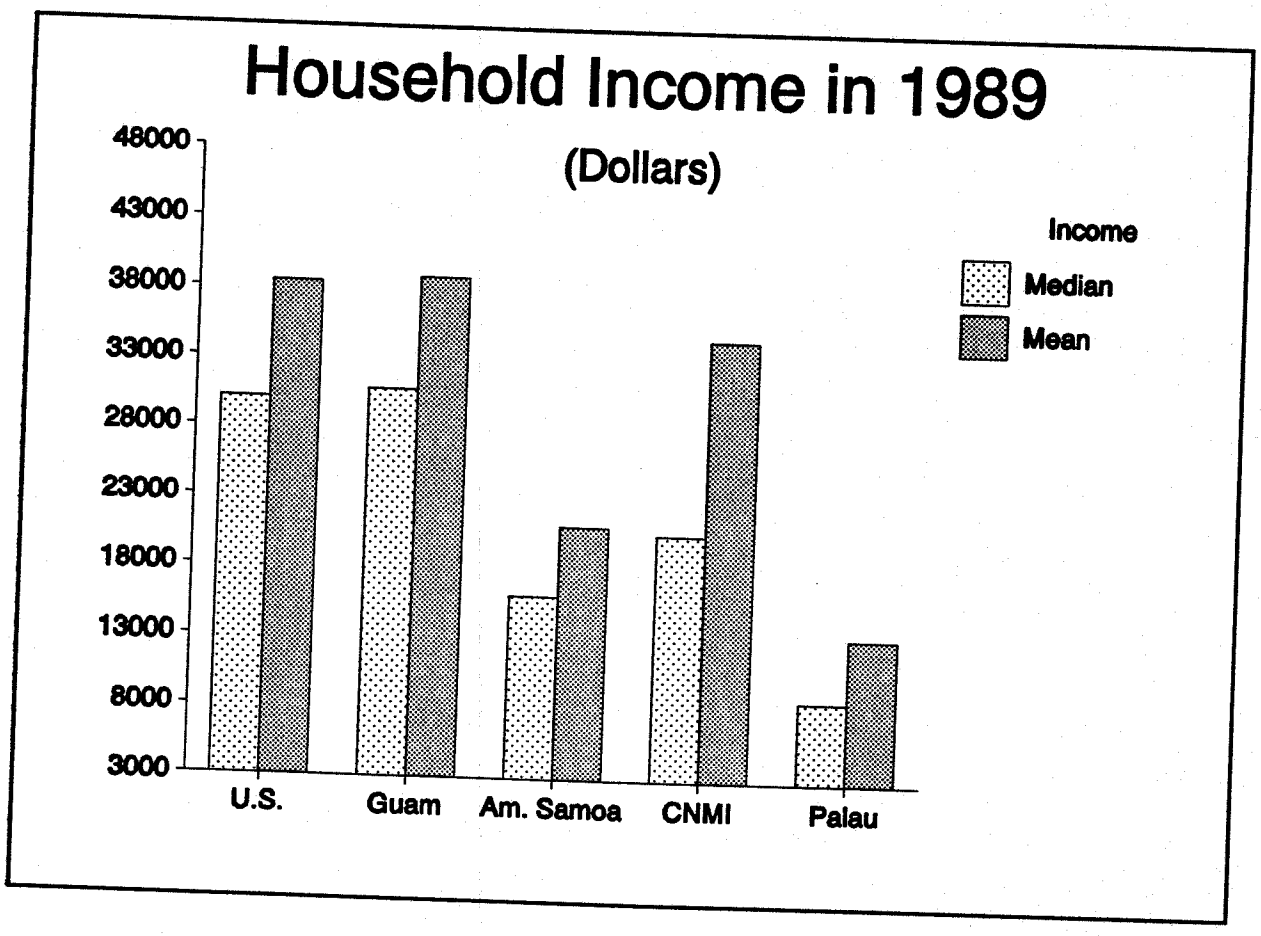
♦ **ALL areas experienced increased labor force participation**



- **NOTE: These are employed persons 16 years and over**
- **CNMI had largest percent in private wage and salary workers**
- **CNMI also had largest jump, almost 30 percentage points between 1980 and 1990**
- **Palau also had very large jump -- about 22 points**
- **Only CNMI had larger percentage in private sector than US**
- **In 1990, all areas had more than half in private sector**
- **In 1980, American Samoa and Palau had more in public than private sector**



- **NOTE: I'd ignore the 1980 data**
- **These are EMPLOYED persons 16 years and over**
- **US had 23 percent professional and related service industry workers**
- **American Samoa and Palau highest among Pacific areas, CNMI lowest because of large private sector employment**
- **Guam had higher percentage in retail trade than US, all others lower.**



- **NOTE: Values are for income in all of 1989**
- **US and Guam about the same**
- **CNMI about 2/3rds of Guam and US**
- **American Samoa more than half of Guam**
- **Palau - lowest of all, but subsistence has something to do with this**