Tonga Population Profile

DEMOGRAPHY

A GUIDE FOR PLANNERS AND POLICY MAKERS

SOUTH PACIFIC COMMISSION

TONGA POPULATION PROFILE

A guide for planners and policy-makers

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FOREWORD

For almost 15 years, the South Pacific Commission's Demography/Population Programme has assisted Pacific Island countries and territories in the population sector. With generous assistance from UNFPA, until the end of 1992, SPC was able to provide assistance over a broad range of demographic issues and activities to its 22 Pacific Island members. Most of its activities concentrated on population censuses and surveys, covering all aspects from design, data collection, processing to analysis, including training and institutional capacity building in these areas. The SPC Population/Demography programme established a tradition of providing quality advisory services throughout the region, in a technical discipline which most Pacific Island Governments still find difficult to address due to a lack of suitably-qualified national staff.

From 1993 onwards, the main SPC Demography/Population programme emphasis has shifted from data collection/processing/demographic analysis to data utilisation, paying greater attention to the interrelationship between population and development. This new and more applied emphasis is in response to demands from our member countries and territories, acknowledging that most planners have had no formal and/or first-hand experience with population matters; therefore they were neither in a position to incorporate population considerations into development planning processes, nor to appropriately digest highly technical demographic analyses.

To redress this situation is the main objective of the SPC Integration of Population Issues into Development Planning project, which is supported through a generous multi-year financial assistance arrangement with the Australian Agency for International Development (AusAID). The project has two key components:

— to provide training for national and sectoral development planners and project economists in techniques of incorporating population considerations into national planning processes; and

— to pay greater attention to the analytical component in 'demographic analysis', and undertake more policy- and planning-relevant demographic analyses to assist member countries and territories in the formulation of their national development plans and strategy frameworks.

This report addresses the second objective, and is a first attempt to provide a brief demographic profile that is useful for planners. Unlike more traditional demographic analyses, which are usually indigestible by non-demographers, we tried to write for a non-technical audience, paying less attention to discussing

mathematically complex demographic concepts at great length, and, instead, more attention to specific implications for planners.

With Tonga's next census scheduled for 1 December 1996, some may question the purpose of producing an analysis based on 1986 census data. The reality is that this analysis was required to assist planners and policy-makers in the preparation of Tonga's first strategic development plan and other important policy developments—activities which could not wait until the 1996 census results became available (not expected before early 1998); at that time, a new, revised profile will be prepared.

This volume was prepared under the leadership of Mr Andreas Demmke, and involved all members of the South Pacific Commission's Population/ Demography programme. Work on an earlier version of this paper by Dr Noor Khalidi, a former programme staff member, is much appreciated.

We also would like to extend our gratitude to Caroline Nalo, Jipé Le-Bars and Patricia Martin, for their skills and contribution in editing, artwork and layout respectively.

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South Pacific Commission

SUMMARY

The 1986 census of the Kingdom of Tonga enumerated 94,649 people.

The population was dispersed over 36 inhabited islands (altogether there are about 150 islands) in 5 distinct island groups; 67.4 per cent of the country's population lived on the main island, Tongatapu.

Tonga had a very young population; 41 per cent were under the age of 15, with a median age of 18.1 years.

The latest population estimate available is for 1993. The Tongan Child Health and Family Planning staff enumerated 90,644 people in 1993, a number gathered during a house-to-house population count.

Based on the number of registered births and deaths until 1994, it can be concluded that the level of natural growth has decreased somewhat since 1986.

Tonga's total fertility rate was estimated to be 5.2 in 1986 and is estimated to be around 4.2 in 1996.

Life expectancy at birth stood at 67.6 years for males and 70.7 years for females in 1986, which means that Tongan women can expect to live, on average, 3 years longer than males. It is expected that life expectancy has increased since then, to 70 and 73.5 years for males and females, respectively.

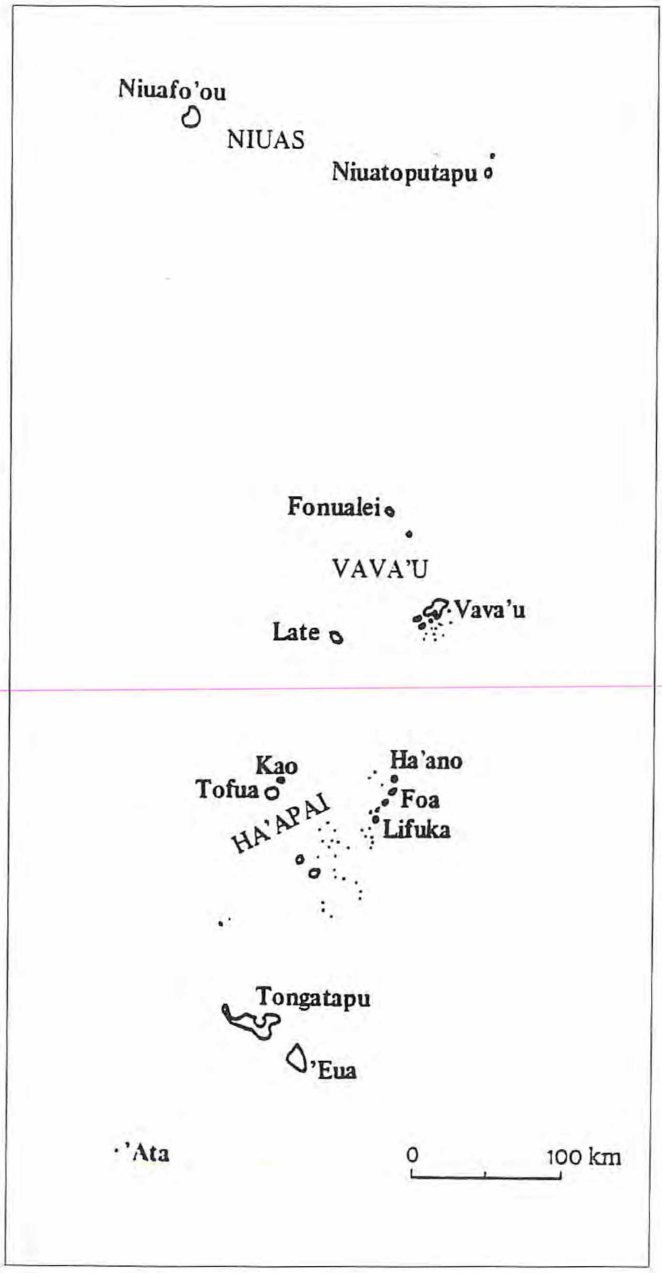
Just under half of the country's working-age population were economically active in 1986.

Tonga has a very high level of educational attainment, 97 per cent of its population over five years of age having had access to education.

Tonga's natural population increase in recent years stands at more than 2 per cent per year. This rate of natural increase is counter-balanced by heavy international migration of Tongan nationals to other countries (New Zealand, Australia, the US), resulting in an average population decrease in recent years of around –0.6 per cent per year (1986–1993).

This highlights that international migration is a very important determinant of Tongan population dynamics. Significant changes in international migration streams would have considerable implications on the population and the overall development activities of the Government.

As the Tongan population would probably double in the next 24–30 years without migration, it is surprising that no systematic mechanism is in place to monitor international migration to and from Tonga and provide policy-makers and planners with reliable and up-to-date information.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1. INTRODUCTION

Throughout various stages of their lifetime, people have different demands on different services. Almost every aspect in life is somehow associated with age, and age 'creates' very special demands, for example:

— young children need special health care (immunization);

— children usually commence their formal education at around age six (schools, teachers' materials);

— young people leave their parents' house (housing);

— school leavers search for work (employment opportunities);

— child-bearing is usually confined to women aged 15–49 (demanding maternal/child health/family planning services);

— elderly people have particular demands (special health care, transport, housing).

For governments to effectively cater for the specific needs of different population groups, it is important that planners have a clear picture of the demographic make-up of the population. In other words, planners need to be aware of their country's population structure and population processes. *Population structure* refers to: population size, geographic distribution, age-sex structure, socio-economic characteristics (economic activity, education, attainment of population). *Population processes* refer to: population growth, fertility, mortality, migration (including urbanization).

Apart from playing an important role in shaping a country's economic and social development, population structure and processes can also be the direct result of development. This is quite evident in situations where population policies are incorporated into development plans with the aim of altering specific population variables:

— greater budget allocation to a country's Ministry/Department of Health to expand its maternal/ child health/family planning services (MCH/FP) can lead to fewer deaths of infants, children and women;

— incorporating family health education in school curricula may lead to a lowering of fertility and a healthier lifestyle for future generations;

— the promotion of rural employment opportunities and accessibility of services may well slow down rural-urban drift.

It should be kept in mind that population policies, even when they are well implemented, usually do not produce results for quite some time.

Accepting that population factors are important components of development, and accepting the premise that development is ultimately about people (specifically, about improving people's lives), it will be clear to everyone involved in planning and policy-making that incorporating population considerations into the planning process is at the very heart of planning and development.

The aim of this paper is twofold: it has been written to:

1) familiarise planners and policy-makers with some of the key features of the demography of Tonga; and

2) discuss some of the key implications for development planning and policy.

Two qualifications need to be made about timeliness of data and scope of analysis. Some may question the sense in attempting a planner-friendly demographic analysis of Tonga based on old (1986) census data, particularly in light of Tonga's plan to undertake a new census in 1996. However, the Central Planning Department has been entrusted with preparing both a strategic development plan for 1995–97, and a national population policy-awareness seminar in July 1996. The data from the forthcoming 1996 Census will not be available in time to be used in these exercises. Therefore, we hope the analysis in this paper, and especially the analyses of population forecasts, will be helpful for planners and policy-makers in preparing the strategic development plan for 1995–97, and for future discussions on national policy matters.

Regarding the scope of analysis, the emphasis is to provide a brief overview on some of the key implications for Tongan planners and policy-makers. More detailed analyses can be undertaken on any other specific sectoral issue or subject, of course, providing data are available. This analysis draws on the following source material: the 1986 Census Report (published in 1991 by the Tongan Statistics Office), the demographic analysis undertaken by SPC (completed in 1991 and published by the Government of Tonga in 1993), and Ministry of Health annual reports for 1980–1993.

2. POPULATION STRUCTURE

2.1 Size and distribution

Population has major implications for planning decisions as both a consumer and a producer of goods and services. Population factors such as size and growth have major roles in determining overall development objectives. Therefore, plans regarding production, consumption, investment, distribution, education, health, housing and so forth need to be closely connected with population factors. The 1986 Census enumerated a total resident population of 94,649 people.[1] The geographic distribution of the population was very uneven, with 2 out of 3 Tongans living on the main island of Tongatapu, the location of Nuku'alofa, Tonga's only major town and political and economic centre. Population density ranged from 33 persons per square kilometre in the Niuas to 245 persons per square kilometre in Tongatapu (Table 1).

Table 1: Population distribution by divisions, 1986

Division	1986 population	% of total	Density/ sq. km.	Annual rate of growth
Tongatapu	63,794	67.4	244.9	1.1
Vava'u	15,175	16.0	127.3	0.1
Ha'apai	8,919	9.4	81.1	–1.9
'Eua	4,393	4.7	50.2	–0.2
Niuas	2,368	2.5	33.0	0.2
Nuku'alofa	21,383	22.6	–	1.6
Greater Nuku'alofa	29,018	30.7	–	2.5
Total	94,649	100.0	145.9	0.5

Source: Based on 1976 and 1986 Census data.

Implications for planning

— The geographical distribution of the population and its patterns of settlement influence an equitable programming of services, since Nuku'alofa, with its concentration of the major part of the population, demands and attracts almost automatically all the attention of planners and decision- makers. A high concentration of people on Tongatapu, and in Nuku'alofa specifically, means much better medical services, as population numbers justify the placement of various medical specialists at Vaiola Hospital. The same is true for educational institutions, availability of information of all kinds, communication facilities, financial institutions and entertainment (cultural events, night life, cinemas, etc.)

— The small population sizes of many outer islands make the establishment of services of any kind expensive and cost-ineffective. For example, health service delivery can only be on a very basic level, and can never be of the same quality as that on Tongatapu. Provisions need to be in place to allow transport to Tonga's main clinical referral facility (Vaiola Hospital) for medical emergencies.

— Since the provision of better services in towns is seen by many rural and outer island people as a major advantage of life in town, it may be a main reason for relocation to Nuku'alofa.

— High population densities, however, also mean more stress on the environment, and consequently the need for higher priorities on environmental health services.

2.2 Age and sex

As already briefly stated in the introduction, there exists a very strong relationship between specific human needs and age. In demography, most rates, numbers and figures are age-specific. Examples are: age-specific fertility rates, age-specific mortality rates, infant mortality rates, age pattern of fertility, age ratio, childbearing ages, mean age of childbearing, mean age of marriage, etc.

Development and planning objectives are often formulated with respect to population groups whose characteristics are usually associated with age and age-related factors, such as infants, children and adolescents, pregnant women, workers, students, elderly persons and so forth. Therefore, the age distribution of a country's population becomes a very important consideration in planning.

As Figure 1 shows, Tonga has a very young population; 41 per cent are under the age of 15 (Figure 1 and Appendix Table 1).

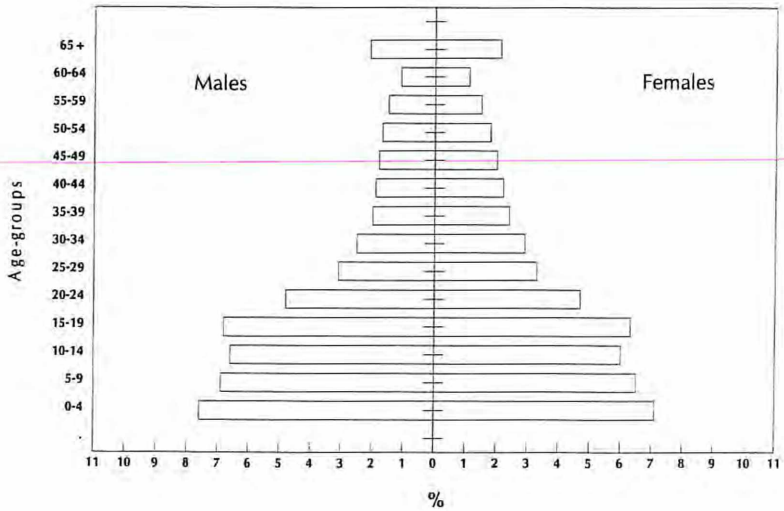

Figure 1: Age-sex structure of the Tongan population, 1986 (Percentage of total population)

This is the result of persistent high fertility and migration over the past 30 years, while mortality, especially infant and child mortality,[2] have declined during the same period.

The birth cohorts, or, in other words, the number of births in a given period (for example, during one year or 5 years), form the basis of a population pyramid. If there is a strong trend of out-migration, as is the case in Tonga, the population pyramid quickly narrows at ages 20 and over, since it is usually people of these ages who go overseas for educational or employment opportunities.

The dependency ratio is 82, which means that for every 100 persons in the working ages,[3] there were 82 persons in the dependent ages of 15 or less (74) and 65 and over (8).

Since the working-age population economically supports the rest of the population (dependent ages), it can easily be seen that the higher the dependency ratio, the higher the number of people who need to be cared for by the working-age population (and from those, only the ones who actually do work and earn a living).

The trends and composition of international migration have also affected the age structure of the Tongan population.

The effect of international migration can be most clearly seen on the smaller-than-expected size of the age-group 20–40 and especially of the ages 25–29 years from the 1986 Census (see Appendix Table 2).

However, it needs to be noted that the age and sex structure of the Tongan population could be quite different by now, due to possible changes in international migration streams, especially considering the departure of 5000 Tongans to New Zealand between December 1986 and February 1987.[4]

The current Government practice of not collecting departure information on Tongan nationals makes accurate population updating very difficult.

Regarding the gender make-up of the Tongan population, the distribution of males and females was fairly even in 1986. The national sex ratio was 101. This means that there were 101 men for every 100 women.[5]

Sex ratio at birth is generally around 105, which in Tonga is consistent with a sex ratio for the 0–4 year age-group of 105.6. However, the registered numbers of birth by sex for the years 1987–1992 give a sex ratio of about 110, which points to some registration flaws, probably due to the omission of baby girls. Nevertheless, birth registration is considered near complete, with a coverage of 95 per cent for girls and 98 per cent for all births. This would result in 50 to 60 'forgotten' baby girls.

The sex ratio of a population and its age-groups is the result of the sex ratio at birth and gender differentials in mortality and migration. In general, sex ratios

tend to decline by age, reflecting higher mortality of males. This, however, is not the case in Tonga. The ratios between 25 and 60 years of age are lower than expected and can be explained by sex-and-age-selective out-migration. In the 1986 Census report this phenomenon was related to a tendency for more males than females to seek employment opportunities overseas (Kingdom of Tonga, 1991: ix).

Implications for planning

— A country's age structure has important implications for all its development policies and programmes, as people have different demands on different services throughout their lives, for example:

* infants require efforts to improve immunisation coverage, in order to lower infant mortality;

* the size of the primary-school-age population (usually 6–12-year-olds) determines the demands for primary education (schools, classrooms, teachers, materials).

— Tonga's young age structure demands that a large proportion of its resources be invested in the age-group 0–15, particularly in education and training. These investments obviously also need to be accompanied by economic development activities, preferably of the type not merely geared towards economic growth *per se*, but primarily towards employment creation.

2.3 Households

The size and composition of a household depend mainly on the socio-economic and cultural factors of a country. The composition of households is determined in the first place by the structure of the families (whether nuclear or extended), but also by the age of young people leaving their parents' house in order to form their own household and whether they do this with or without family (single household, couples without children, etc.).

The housing market (availability and costs of suitable housing) and the availability of land to build upon also have a big impact on the composition of the households.

In 1986, the population of Tonga consisted of 15,091 households with an average of 6.3 persons per household. This figure has remained quite stable since 1976 (6.5 members per household).

No information is available on the current size or composition of households. If the 1976–86 trend has continued in recent years, we may still find household sizes of around six members. Since there appears to have seen a further decline in fertility, combined with continued out-migration, it would not be surprising if household size had decreased somewhat.

Implications for planning

— Since there is no new information available on the current size of the population or the exact size and composition of Tongan households, it is not possible to advise on any implications for planning, except by making some general remarks:

* Planners and policy-makers should be aware of changes in household composition and their impact on demands for housing and for different types of dwellings, in order to be able to supply the right quality and quantity of housing;

* Possible changes in households' composition could also have serious effects on Tonga's traditional welfare system. It should be noted that the Government has repeatedly emphasised the critical and pivotal role of the family—both nuclear and extended—advocating the need for more positive thinking about the family and its role in population and development. Such intentions need to be translated into concrete policies and programmes favouring and protecting family units.

2.4 Educational characteristics

Educational attainment is very high in Tonga. By 1986, only 3.2 per cent of the population 5 years and over had had no schooling by 1986. The proportion of people with secondary education increased by 11 per cent (from 45% to 56%) between 1976 and 1986 (Appendix Table 3). Tertiary education has not increased since 1976 and remained at 1.5 per cent.

School enrolment is very high. At primary level it is almost universal, for both boys and girls (Appendix Table 4). At primary and secondary levels, enrolment rates for females are generally equal to or higher than those for males, yet at tertiary level they lag behind males. Early marriages and childbearing are one explanation for this situation. From the number of registered marriages by sex and age-groups for the years 1990 to 1992 (Appendix Table 5) and from proportions of ever-married people (Appendix Table 6) it can be seen that about 2.9 times more females marry between the ages of 15 and 19 than males.

The available information does not make it possible to say whether there is a gender bias towards tertiary education, or whether it might be attributed to parental attitude and availability of scholarships.

Implications for planning

— Changes in a country's demographic structure clearly affect educational needs. The higher a country's level of fertility, at given levels of mortality, the larger its school-age population relative to the rest of the population.

— This, however, seems to be a less urgent problem in Tonga, with falling fertility on one side and a low rate of annual population growth due to continued out-migration on the other.

— In view of Tonga's young age structure (due to high past fertility), the Government may need to supply more classrooms and a larger number of teachers in future years if it wishes to maintain current enrolment levels and equivalent pupil-teacher ratios. This will largely depend on future developments in fertility, and particularly in migration, and will be discussed more fully in Section 4.

— In general it can be stated that the Tongan population was more educated in 1986 than in 1976. This development means a more educated labour force, demanding suitable job opportunities.

2.5 Economic activity

Of the country's total working-age population (15 to 64 years), 44.6 per cent were economically active (Appendix Table 7). The term 'economically active' refers to people who, at the time of the census were either employed, or actively looking for employment. In other words, it refers to a country's labour force. Of the economically active population, 91 per cent were employed at the time of the census, which brings Tonga's employment:population ratio[6] to 39.5 per cent.

Significant differences exist between males and females in labour force participation;[7] 71 per cent of all males aged 15–64 were economically active, compared to only 19 per cent of women of the same age-group. This means that Tonga's male employment:population ratio (66.1%) is 4 times that of women (15.5%). It is also important to note that although far fewer women (5,000) than men (18,000) are economically active, even these small numbers have great difficulties in finding employment, as evident from the unemployment rates of 6.7 per cent for men and 18.8 per cent for women.

It should be noted that the definition of 'economic activity' does not include household work, which is mainly done by women. Furthermore, women working in subsistence farming are often overlooked. Therefore the numbers given above should be used with care.

IMPLICATIONS FOR PLANNING

— In recent years, various official statements have emphasised the need for a greater participation of women in development activities. One way to translate this into action is to target job creation and expansion of employment opportunities, and specifically address current gender imbalance and the specific needs of women.

— Demographic factors are prominent in the case of employment planning. Fundamentally, the setting of employment targets must depart from the traditional projected labour-force growth, since opportunities for labour-intensive techniques are becoming limited and development plans are generally productivity-oriented rather than employment-oriented. A more active promotion of various types of labour-intensive development projects would be a positive step.

3. POPULATION DYNAMICS

3.1 Population growth

There are two ways for demographers to describe population growth. We speak of *natural increase*, which describes population increase as the result of births and deaths only. Growth occurs when the number of births in a given time-period (such as a calendar year) exceeds the number of deaths. Negative growth, or population decline, occurs when the number of deaths exceeds the number of births. In other words,

Natural increase = births – deaths

Throughout the world and throughout time, population growth is shaped by a further component: migration. In many countries, and particularly in the Island countries of Polynesia, migration is a major contributing factor to a country's population dynamic. In such circumstances we cannot only look at natural increase. The overall *population growth* defines the change in a country's population as the result of births, deaths and migration. Migrants encompasses those people who come into the country in order to settle or seek residency (whether or not permanent), the immigrants or in-migrants, and those who leave the country to seek residency (permanent or not) in a foreign country, the emigrants or out-migrants.

The term 'net migration' refers to the sum of the in-migrants minus out-migrants.

This relationship is readily summarised in what is commonly referred to as the 'balancing equation' (see Table 2):

Population growth = natural increase (births – deaths) + net migration (immigration – emigration)

The most basic demographic measures referring to births and deaths are the so-called Crude Birth Rate (CBR) and Crude Death Rate (CDR). They refer to the number of births and deaths in a given year for each 1,000 people. For Tonga, an average CBR of 34.2 for the intercensal period 1976–1986 means that during that period, there were about 34 births each year for every 1,000 people. A CDR of 5.6 in the same period means that there were about 6 deaths for 1000 people.

By subtracting the CDR from the CBR, we obtain the rate of natural increase as stated above:

CBR(34.2) – CDR(5.6) = 28.6 per 1000 people in 1986

Expressed in the more frequently used percentage terms, this is a natural increase of 2.86 per cent.

The latest registration data of 1993 indicate that Tonga's rate of natural increase has declined very slowly, from 2.8 per cent during the intercensal period 1976–1986 to about 2.2 per cent in 1993 (CBR = 26.2 – CDR = 4.2). Care should be applied when using reported numbers of births and deaths, since they are sometimes under-registered and/or incomplete and/or the estimated underlying number of total population is under- or overestimated.

In contrast to these relatively high rates of natural increase, the average annual population growth rate of Tonga between 1976 and 1986 was calculated at around 0.5 per cent.

If the MCH/FP population figure of 90,644 people for the year 1993 proves to be accurate, the annual growth rate in the years immediately following the 1986 census could have been even lower. In fact, the growth rate between 1986 and 1993 would be negative: –0.6 per cent (see Table 2) !

Table 2: Balancing equation

Year	Total population	Annual growth rate (%)	Rate of natural increase (CBR–CDR) (%)	Migration rate (growth rate–natural increase) (%)	Assumed annual net migrants
1976	90,085 (a)				
1986	94,649 (b)	**+ 0.49** (1976–86)	**+ 2.86** (1976–86)	**– 2.37** (1976–86)	**– 2,189** (1976–86)
1989	91,056 (c)	**– 1.29** (1986–89)	**+ 2.29** (1986–89)	**– 3.58** (1986–89)	**– 3,324** (1986–89)
1991	88,508 (d)	**– 1.34** (1986–91)	**+ 2.30** (1986–91)	**– 3.64** (1986–91)	**– 3,333** (1986–91)
1992	90,369 (d)	**– 0.77** (1986–92)	**+ 2.23** (1986–92)	**– 3.00** (1986–92)	**– 2,775** (1986–92)
1993	90,644 (d)	**– 0.62** (1986–93)	**+ 2.23** (1986–93)	**– 2.85** (1986–93)	**– 2,640** (1986–93)

Sources:
(a) 1976 census,
(b) 1986 census,
(c) Estimated by the Tongan Department of Statistics,
(d) House-to-house count by the MCH/FP team.

Once we apply the rates obtained during the period 1976–1986 to the balancing equation, together with the known CBR (34.2) and CDR (5.6), we obtain a Crude Net Migration rate of 22; in other words, between 1976 and 1986, 22 out of 1000 people left the country (migrated overseas). The data for the late 1980s and early 1990s indicate an even higher trend, which unmistakably highlights the continued significance of international migration to population growth in Tonga.

Net migration was probably even higher, if the Tongan MCH/FP data referred to earlier prove to be correct (Katoanga, 1994). These data point to a negative annual population growth rate of –1.34 per cent between 1986 and 1991. Again, application of the balancing equation indicates that Tonga has lost more people (at a rate of –3.64 per cent per year) through international migration between 1986 and 1991 than during the period 1976–86, whereas migration in more recent years (1991–93) would appear to have slowed somewhat again to levels comparable to the situation in the mid/late 1980s.

IMPLICATIONS FOR PLANNING

— From recent government documents,[8] it appears that the Tongan Government does not consider population growth *per se* as an issue of major concern. This is quite understandable. There was a very modest population growth rate of only 0.5 per cent between 1976 and1986[9] and a net loss of population after that, while the real growth in per capita Gross Domestic Product (GDP) averaged 2 per cent during the 1980s. In other words, economic growth outpaced population growth.

— However, this optimism is based on rather shaky grounds, since Tonga's rate of natural increase exceeded economic growth. If there had not been out-migration on the scale described above, per capita Gross Domestic Product would probably have been much lower. Since exact migration data are not available, due to a lack of reporting mechanisms, the situation can only be estimated. This will be discussed more fully in Sections 3.4 and 4.

3.2 Fertility

Fertility refers to the reproductive behaviour of a population, relating to the number of live births a woman has had. The fertility of a population depends on various factors:

— demographic composition of the population (particularly number and age of women);

— fecundity (biological/physiological ability to reproduce);

— age at cohabitation/marriage;

— availability and use of family planning;

— psycho-social and cultural context (abstinence after birth of child, breastfeeding, family size preference/value of children);

— economic development;

— status of women (place in society, level of education, work status).

After migration, fertility is the demographic component which has the biggest impact on a country's age-sex composition, as the composition and size of different age-groups depend largely on birth rates. For example, falling birth rates and improved mortality (increased life expectation at birth) reduce the proportion of children, so the population becomes older.

The demographic indicator most commonly used to describe a country's fertility situation is called the Total Fertility Rate (TFR). This measure basically tells us how many children a woman gives birth to, on average, during her reproductive life (15–49 years of age). It is calculated from the number of live births by age of women in a given year, the Age-Specific Fertility Rates (ASFRs). Data needed are the total number of births by age of women in a given time interval (usually a calendar year) and the total number of women in each age-group. Data usually come from vital and civil registration systems; where such information is not available or considered incomplete or untimely, we rely on censuses and/or specific surveys.

Overall, fertility declined rather slowly over the three decades up to the mid-eighties. The TFR declined from about 6.5 in the mid-1950s (Muthiah, 1992: 42) to around 5.2 in 1986, indicating an average decline of about 1 child per woman. A decline in fertility is evident from the declining Crude Birth Rates (CBR),[10] which stood at 28, 27 and 24 per 1000 people respectively in 1981, 1986 and 1991 (see Appendix Table 9 for more detail).

Our current estimate of fertility is 4.2 in 1996. This estimate is consistent with the estimated natural increase (overall growth rate less migration rate). It is based on the above-mentioned decline of the CBRs and an assumed decline in fertility from 5.2 in 1986 to 3.2 in the year 2006.

It needs to be emphasised that this figure is an estimate only, because no recent data are available on the number of children born by age of women and total number of women in the age-groups concerned. To establish the required baseline population (of women in their child-bearing ages), accurate and timely migration data are indispensable. In Tonga, such information is impossible to obtain, given the absence of formal system of recording and reporting of international migration.[11] While it should be possible to obtain the necessary information on age of mother at the time births are registered, we presently have to rely on 10-year-old census information and assumptions about both the number and the age distrbution of female migrants to piece together a likely population of women of child-bearing age. This is a most unsatisfactory situation, given the impact of fertility on population growth and composition.

At present, about one woman in three uses contraceptives (Appendix Table 10). Contraceptive usage has not changed significantly during the past 10 years, as indicated by contraceptive prevalence rates of 34.3 per cent for 1985 and 35.7 per cent for 1993. The declining trend in fertility in recent years can mostly be attributed to educational improvements, especially for women, and possibly changing attitudes in favour of small families.

A small increase in the age at first marriage of Tongan women was observed between 1976 and 1986.[12] For 1986, age at first marriage has been calculated at 27.1 years for males and 24.8 years for females, compared to 27.2 and 24.3 respectively in 1976 (Kingdom of Tonga, 1991: xiv). By age 24, about 21 per cent of all men and 35 per cent of all women are married (see Appendix Table 5).

IMPLICATIONS FOR PLANNING

— Accurate and up-to-date information on fertility levels is crucial for planning, as this particular population process has the single biggest impact on Tonga's population composition. Without such information it is quite difficult to make a realistic assessement of future demands on education and health services, for employment, for adequate water supplies and other physical infrastructure (see Sections 4 and 5).

— Declining fertility, a reduced number of children per woman, has the following effects on a population:

* its growth rate slows;
* the population becomes older (as the proportion of children is reduced);
* there are fewer school-children and declining school enrolments;
* there is less pressure on public and private sectors to provide jobs for school leavers (as the number of school-leavers will eventually become smaller than it is today).

— Various Tongan Government official statements[13] have indicated that fertility reduction through family planning has been Government policy from as early as the 1960s. However, it is admitted that the principles of family planning have not spread rapidly and evenly throughout Tonga, and at times have not been consistently encouraged. The Government has realised that a systematic effort to promote family planning at the national level is needed. In this context (as well as regarding population issues in general), the *Population IEC (information, education and communication) approach* has been adopted by various organisations and agencies, both Government and non-Government, to generate community awareness of population.[14]

3.3 Mortality

The mortality of a population depends on various factors, including:

— demographic composition of the population (age and sex distribution);

— health and medical services (immunisation programmes, maternal and child health care, primary health care);

— environmental conditions and availability of infrastructure such as housing, water supply, sanitation, waste disposal;

— exposure to risk factors, such as substance abuse (alcohol, tobacco);

— occupational hazards (work-related stress and danger);

— exposure to events outside individual control (natural disasters, war);

— social class.

Estimates derived indirectly using 1986 Census data (Appendix Table 9) show that a relatively low mortality level has been reached in Tonga.

The expectation of life for males and females has been estimated to be 67.6 years for males and 70.7 years for females, with an infant mortality rate of 26. This figure means that out of 1000 babies born alive, 26 are dying before they reach their first birthday.

Generally, the level and pattern of mortality for Tonga point to a situation (*regime*) of low current mortality, with slight improvements in recent years.

Once low mortality levels have been reached, as is the case in Tonga, these low mortality regimes do not change rapidly. Crude death rates reported over the past ten years confirm this observation, as indicated by adjusted figures (three-year moving average) of 4.3 for 1986, declining to 4.1 in 1993. The decline in mortality level is mainly caused by declining infant and child mortality (due to immunisation and child health programmes). A further improvement would certainly not be possible if the health budget declined.

These developments show that Tonga's population enjoys a high standard of health, comparable to that of more developed countries. This is mainly the result of much-improved health services, particularly in primary health care programmes, and especially in the maternal and child health area. Generally, the availability of primary health care services is

impressive, as indicated in some of the key achievements (Appendix Table 10):

— 100 per cent of the population have access to safe drinking water;

— 100 per cent of the population have access to treatment of common illnesses and injuries and regular supply of drugs within less than one hour's walk/travel time; and

— 9 out of 10 children are fully immunised before their first birthday (which readily explains the low level of Tongan infant mortality).

IMPLICATIONS FOR PLANNING

— The most important result of improved mortality conditions is healthier people living longer lives.

— Declining infant mortality indicates that improved primary health care programmes are achieving the desired results (particularly the expanded programme of immunisation), and need to be continued if Government wishes to maintain these achievements (sustainable progress). However, disaggregating infant mortality on a regional level (Tongatapu, Ha'apai, Vava'u and Niuas/'Eua)[15] might indicate possible variations. These should prompt planners to guide their future efforts accordingly (by concentrating programme delivery on those areas which are still lagging behind others).

— Higher life expectancies have a direct impact on the age-sex structure of Tonga's population. To make sensible forecasts for an adequate provision of social welfare services (retirement benefits/pension, health care for elderly), good mortality statistics are needed. They should be separated for males and females, by age and preferably also by cause of death. More sustained efforts are required to accurately record all deaths; which could be assisted by better coordination between all relevant agencies involved (Health, Statistics, Justice).

3.4 Migration

Migration is the movement of people across a certain boundary. When this boundary applies to national borders, we speak of international migration. Migration across boundaries inside a country is internal migration. The people involved are referred to as migrants. They are immigrants (or in-migrants) if they are moving into a country and emigrants (or out-migrants) if they are moving out of a country.

Apart from this spatial consideration, time plays a major role, as someone coming from Ha'apai to Nuku'alofa for a short visit can hardly be termed a migrant—he or she is a visitor. Apart from time, intent is also of crucial importance, as a visitor can turn into a migrant if confronted with sudden job opportunities. Along the same lines, a migrant (whom we may define as someone coming to Tongatapu with the intention to live there) may turn into a visitor, if the expected job opportunities do not materialise.

This highlights one of the key problems concerning migration. Whether a particular person qualifies as a migrant or not can only be established *post facto* (after the fact). Planners need to base their decisions on past and projected movements of people.

3.4.1 Internal migration

A comparison of 1976 and 1986 census data shows some small changes in population distribution resulting from internal migration (Table 3). During 1976–1986, the share of Tonga's population living on Tongatapu increased from 64 to 67 per cent, whereas the proportion living in the Ha'apai group declined from 12 to 9.4 per cent.

Table 3: Population distribution and growth by divisions, 1976 and 1986

Division	Area (sq km)	1976 pop.	% of total	Density/ sq km	1986 pop.	% of total	Density/ sq km	Annual growth rate (%)
Tongatapu	260.46	57,411	63.7	220.4	63,794	67.4	244.9	1.1
Vava'u	119.21	15,068	16.7	126.4	15,175	16.0	127.3	0.1
Ha'apai	109.98	10,792	12.0	98.1	8,919	9.4	81.1	–1.9
'Eua	87.44	4,486	5.0	51.3	4,393	4.7	50.2	–0.2
Niuas	71.69	2,328	2.6	32.5	2,368	2.5	33.0	0.2
Nuku'alofa	–	18,312	20.3	–	21,383	22.6	–	1.6
Greater Nuku'alofa	–	22,561	25.0	–	29,018	30.7	–	2.5
Total	648.78	90,085	100.0	138.9	94,649	100.0.	145.9	0.5

Source: Based on 1976 and 1986 Census data.

Tongatapu, which experienced the highest annual population growth rate (1.1%), is the major internal migration destination. This is largely due to the location there of Nuku'alofa, Tonga's capital and main economic and political centre. Nuku'alofa's population increased at an annual rate of 1.6 per cent between 1976 and 1986, which is 3 times faster than the national average.

Table 3 indicates that there must have been considerable movement from all other islands of Tonga to Tongatapu (Nuku'alofa), since the population increase in the Niuas and Vava'u was less than the national average, while 'Eua, and especially Ha'apai, experienced a considerable decline in population between 1976 and 1986.

The growth between 1976 and 1986 in the number of residents born and residing on their island of birth, compared to other places, highlights the emergence of Greater Nuku'alofa as Tonga's prime internal migration destination (Table 4).

Table 4: Annual population growth (%), and growth in migration streams, 1976–86

Place of residence	Place of birth				
	Tongatapu	Vava'u	Ha'apai	'Eua	Niuas
Tongatapu	0.3	–1.1	–0.3	2.0	–0.5
Vava'u	4.5	0.3	1.2		
Ha'apai	2.2	–2.8	–1.1		
'Eua	2.3	–2.5	–1.7	0.6	–2.5
Niuas					0.6
Greater Nuku'alofa	3.1	1.8	3.6	5.7	2.4
	(12,672 → 17,300)	(2,120 → 2,540)	(2,161 → 3,089)	(308 → 542)	(513 → 654)

Source: Haberkorn, G. (1996). Population distribution and migration in the Kingdom of Tonga. Paper prepared by G. Haberkorn, Demographer of the South Pacific Commission, for the National Population Policy Workshop held in Nuku'alofa, Tonga, 8–12 July 1996.

The number of Tongans born and residing on their island of birth increased only marginally for Tongatapu (0.3%), Vava'u (0.3%), 'Eua (0.6%) and the Niuas (0.6%). This increase corresponds reasonably well with the annual population

growth rate of 0.5 per cent in 1976–86. However, the number of Tongans residing in Nuku'alofa and born elsewhere increased at significantly higher annual rates, ranging from 1.8 per cent for Ha'apai to 5.7 per cent for 'Eua-born Tongans. The predominance of Greater Nuku'alofa as the primary internal migration destination is further highlighted by the fact that migration growth to most other destinations was negative.

Ha'apai does not quite fit this overall picture. There was negative growth in Ha'apai-born residents living on Ha'apai in 1986 (1.1%), as well as modest growth in Ha'apai-born people living in Vava'u—both most likely the result of the devastating impact of Cyclone Isaac in early 1982.

Implications for planning

— The continuation of rural-to-urban movement, from the outer islands to Tongatapu, is a cause of concern for the Tongan Government. In order to reduce rural–urban migration, regional planning has been incorporated in development plans, through a programme of rural development designed to improve the standard of living and create rural employment. The Government has made the Ha'apai and Vava'u Development Committees responsible for formulation of programmes designed to deter mass migration to Tongatapu.

— Heavy rural–urban migration usually provides many problems for planners and policy-makers. Policy measures in this context (if there are any) tend to be of a reactive nature. They are designed to accommodate a rapidly-growing urban population and to avoid the emergence of widespread social, health and economic problems. Governments invest large sums in urban infrastructure, as well as in education, health and employment creation. While, without doubt, these measures have to be taken in order to secure a favourable lifestyle for all in the urban area, it is exactly these measures which attract rural dwellers to the city.

— To avoid this, balanced policy options are needed that will create sustainable development of the rural areas also. These measures include the creation of labour-intensive projects, an effective transport and communication system, investments to enhance rural productivity, improved rural infrastructure and social services, and assistance for the establishment of credit, production and marketing cooperatives and other grassroots organisations that give people greater control over resources and improve their livelihood.

3.4.2 International migration

The importance of international migration for Tonga was mentioned in Section 3.1. The impact of fluctuations on the level and pattern of international migration is strongly felt at home and influences socio-economic policy and planning decisions. Unfortunately fluctuations in volume and direction are usually not determined by policy decisions taken in Tonga, but by policy decisions and conditions overseas.

The single biggest impact on Tonga's population comes from international migration. This is clearly evident from the very low overall Tonga population growth rate of only 0.5 per cent between 1976 and 1986, as against a five times larger rate of natural population increase (2.5 per cent) during the same period.

Since the Tongan Government does not collect migration statistics (departure information on Tongan nationals), it is not possible to obtain accurate migration numbers.

As a result, the volume of international migration can only be estimated indirectly and very crudely, using the *balancing equation* discussed in Section 3.1. Net migration is estimated to have been about 2.4 per cent per year for the period of 19761986, and about 4 per cent per year in the period between 1986 and 1991 (see Table 2). This means that an estimated 3000 people have left Tonga annually.

In the absence of long-term international statistics, this is the only way to review Tonga migration developments.

Appendix Table 8 provides data on vital statistics and migration for 1980–94.

It is interesting to consider (for example) the years 1986 and 1987—the year of the last census and the year following. Vital statistics for 1986 give a rate of natural increase of 2.2 per cent; this rate, when compared with the annual 1976–86 population growth rate of 0.5 per cent, translates into a net migration rate of 1.7 per cent for 1986, or 1,609 migrants.

In 1987, there is a higher rate of natural increase (2.5%).[16] Using the 1989 Tongan Department of Health population estimate of 91,056 as a benchmark, we can then establish an annual growth rate of 1.3 per cent between 1986 and 1989, which gives us an annual net migration rate of 3.8 per cent, or 3,551 migrants for the year 1987.

Appendix Table 8 points to large fluctuations in annual migration out of Tonga since 1976, averaging 2,600 per annum between 1986 and 1993. It must be

emphasised that these figures are only crude indicators, as their reliability and validity depend entirely on Tonga's vital registration system, as well as on the accuracy of the annual population estimates provided by the Department of Health.

If the Ministries of Health and Justice, as well as the Statistics Office, can all vouch for completeness of registration of births and deaths, and the Health Department's MCH/FP section house-to-house population counts are accurate, the migration figures mentioned above will be 'spot-on'. On the other hand, if births were under-reported by, say, 10 per cent, the net migration totals would be over-estimated by between 200 and 300; were death registration 'out' by, say 50 per cent, the net migration total would be over-estimated by a further 200–300 annual emigrants. Assuming a worst-case vital registration scenario of 10 per cent under-reporting of births, and 50 per cent under-registration of deaths, this would translate into an average annual net emigration of between 2,000 and 2,200 Tongans, instead of the 2,600 annual average estimated for the period 1986–1993.

Is such large-scale annual emigration possible? Are such large annual variations as those between 1986 and 1987 feasible? Or do these figures simply reflect bad statistics? To answer these questions we will have to turn our attention to other data sources, such as migration statistics collected in the principal migration destinations of Tongan migrants.

Tongan migration to New Zealand

Examination of 1981 and 1991 New Zealand Census data, for example, show that such large annual migration numbers are indeed quite possible. Between 1981 and 1991, New Zealand's Tongan population more than doubled in size, from just under 9,000 in 1981 to 23,175 in 1991, making Tongans the third-largest Pacific Island population in New Zealand.[17] That means that there were just over 14,000 more Tongans in New Zealand over a ten-year period, or expressed differently, an average of 1,400 more per year. Considering that Tongans also move in large numbers to the US (mainland, American Samoa, Hawaii) and Australia, the rough total emigration figure of some 2,600 per year identified earlier does not seem to be too far-fetched.

It also appears that the 1986–87 extreme of annual variations in migration flows referred to earlier is quite realistic, even in the absence of migration statistics for these years. In late 1986 and early 1987, New Zealand experimented with visa-free entry for several countries, including Fiji, Tonga and Western Samoa, in order to assist tourism and business travellers. This experiment proved such a success with Fiji, Tonga and Western Samoa nationals

(with many thousands vying for available air-tickets) that after relaxing visa conditions in December 1986, New Zealand quickly abandoned the scheme again in February 1987, reverting to the old policy of visa-required entry. During the 3 months this system was operational, many thousand Tongans left for New Zealand, and a significant number stayed on; for 1987 alone, New Zealand migration statistics show a net inflow of 4,637 Tongans to New Zealand (Bedford, 1994).[18]

This emigration bonanza (at least to New Zealand) seems to have slowed down a little after 1987. An examination of annual migration flows from Tonga to New Zealand for the period 1987–1994[19] shows two interesting developments:

— between 1987 and 1990, Tongan net migration to New Zealand totalled +6,567 people (or 1,640 per year), whereas

— between 1991 and 1994, net migration of Tongans to New Zealand totalled –1,884, meaning that more Tongans left New Zealand than arrived there.

Does this mean a halt in Tongan emigration, or a massive return migration to Tonga? Not necessarily, according to Bedford's (1994) analysis of Fijian, Tongan and Western Samoan migration to and from New Zealand. This analysis shows that in 1991, for example, out of a total Tongan net emigration from New Zealand of –944, only 37 moved to other Pacific Island destinations (including Tonga); 57 moved on to Australia; and 850 moved elsewhere. In other words, a slowing of Tongan migration to New Zealand could simply have meant a change in migration destinations. The possibility of a slowing-down process is indirectly confirmed by Appendix Table 8, which points to a drop in net emigration after 1991, after 5 years of sustained annual levels of over –3,000 people.

Tongan migration statistics—a pilot scheme

Considering the crucial importance of international migration for Tonga's overall population growth and its critical implications for domestic planning and policy formulation, and given the absence of any real international migration statistics in Tonga, the Department of Statistics embarked on a pilot study to monitor international departures and arrivals.

The monthly data available from January 1995 to April 1996 present an interesting picture for 1995: with 41,209 arrivals, and 44,245 departures, Tonga's net migration stood at –3,036. This not only underlines the continued importance and magnitude of emigration from Tonga, but also validates our indirect assessment of migration through comparing population growth rates with annual rates of natural increase.

IMPLICATIONS FOR PLANNING

— Annual net migration numbers of around –3,000 Tongans are responsible for a low and even negative population growth rate, providing the false impression that in light of an annual per capita increase of GDP of 2 per cent, population growth is really of no concern to Tonga.

— Unfortunately, the above is not the case, as there is also a moderately high annual rate of natural increase. Recent changes in migration numbers to New Zealand illustrate the extreme vulnerability of countries like Tonga. With a small annual population growth of 0.5 per cent, as between 1976 and 1986, the doubling time for Tonga's population would be about 140 years; without international migration outlets, the doubling time would be about 30 years.

— Problems associated with high rates of emigration (out-migration) have been acknowledged by the Tongan Government in recent documents, as a matter of concern that requires immediate action.[20] However, meaningful policies and plans to influence international migration cannot be formulated and implemented without an accurate knowledge of the magnitude of international migration (including duration of absence, age-sex distribution of migrants, etc.). Therefore, Government concerns need to be reflected in concrete steps towards introducing a simple but timely and reliable migration registration system for arriving and departing passengers. Without such information, it is impossible to establish reliable population parameters and to undertake meaningful development planning.

— In economic terms, remittances from Tongan migrants abroad represent the largest inflow of foreign exchange to the Kingdom, averaging T$41 million per year between 1990 and 1993. In 1992–93, net private remittance transfers stood at T$47.9 million, or three times the value of total export earnings from commodities, and the equivalent of two-thirds of Tonga's total import bill.[21] In macro-economic terms, these private remittance transfers resulting from the presence of large Tongan communities abroad mean that the Tongan Government does not need to source between T$40 and 50 million per year from international loans or development assistance (Haberkorn, 1995).[22]

— Permanent resettlement and/or the introduction/maintenance of temporary work permit schemes for a limited number of families from small and resource-poor Pacific Island countries to New Zealand and/or Australia, appears to be a development (policy) option, worthy of more active consideration by Tonga and its main development partners.

4. LIKELY FUTURE DEVELOPMENTS

4.1 The importance of population projections

It is becoming increasingly recognised that when socio-economic development plans are being formulated, population variables have to be considered together with economic and social conditions.

If governments are to cater effectively for specific needs of different population groups at different points in time, it is important for planners to be in a position to provide policy-makers with 'a look into the future'. The appropriate method of doing this is to provide a series of future population scenarios, pictures of what Tonga's population would look like in future years under various conditions.

Scenario-building is based on population projections. The starting point for any projection is a reliable age-sex distribution of the population and information about fertility, mortality and migration. Various mathematical methods are available for computing future population scenarios. Most of these are based on the cohort-component method. Some statistics officers and planners who attended the SPC population workshops (e.g. in Nuku'alofa, 20–24 March 1995) are familiar with this method.

The key to making meaningful projections lies in the choice of assumptions regarding future population developments. These assumptions concern, in the first place, possible future birth, death and migration rates. The main objective of providing future population scenarios is not to predict the future (*what will happen*), but to describe '*what would happen if*' a specific scenario materialised.

Given the ability to specify future demographic developments, we are in a position to evaluate the likely outcomes of specific policy interventions without actually having to implement them. An example will illustrate this:

— The Tongan Government wants to evaluate the impact of international migration on the growth of the population. In other words: what would Tonga's population look like if net migration was zero for a period of, for example, ten years ? In this case the growth of the Tongan population would be determined by its natural growth (births and deaths only).

— Population projections allow us to examine this situation without actually having to close Fuamotu Airport for ten years (see Section 4.3).

Scenario building based on population projections should be treated as an essential planning tool, equivalent in importance to other, more traditional, social, economic and financial analyses undertaken by planners worldwide.

4.2 Projection assumptions

In order to have a clearer understanding of Tonga's population situation in ten years' time (2006), we undertook several projections, using the following assumptions:

— Since estimates of the population size for the years up to 1993 are already available, we decided to start the projections in 1991;

— The 1991 **base population** is derived by projecting the 1986 census population forward, using the 1986 Census age and sex distribution in consideration with the assumed trend for mortality and fertility given below;

— We assume a decline in **fertility** from the estimated 5.2 in 1986 to 4.7 in 1991 and 3.2 in 2006. This assumption is based on the 1986 Tongan Census analyses, past trends in fertility, and an anticipated slow decline in the number of children born per woman which would be in line with the fertility trend experienced in other Pacific Island countries in recent years;

— **Mortality** is also expected to decline. We have assumed an increase in life expectancy for males from 67.6 in 1986 to 72.2 in 2006, and for females from 70.7 to 76.1, based on a UN working model for mortality improvement;

— **Migration**: number of migrants is estimated as the difference between natural growth and overall population growth during a particular period. Age distribution for migration is derived from data on international arrivals and departures for Tongatapu for 1995. The sources of these data are Immigration arrival cards, and aircraft manifests. This age structure for migration remains constant, for the sake of simplicity and because of a lack of data.

Making assumptions about future migration trends is extremely difficult. One reason is the lack of reliable current data; another is the enormous fluctuations in the level and pattern of international migration. It is therefore necessary to specify several different migration scenarios in order to visualise the important impact of migration on the population of Tonga.

Four different projection scenarios are presented in this paper. These projection scenarios cover the 15 years from 1991 to 2006 (see Appendix Table 11). The different scenarios are described below.

Scenario 1 (Constant variant)

Fertility: The estimated total fertility rate (TFR) of 4.7 in 1991 remains constant until the year 2006.

Mortality: The level of life expectancy gradually increases from 67.6 for males and 70.7 for females in 1986 to 72.2 and 76.1 in the year 2006 in accordance with the UN working model of mortality improvement. In order not to produce too many scenarios, we decided to let the level of mortality improve in all scenarios (even in the *Constant variant*), since changes in the level of mortality usually have only a very insignificant influence on the overall population growth rate.

Migration: There is a constant rate of out-migration of 3000 persons per year.

Although a no-change scenario is highly unlikely to happen, it is given here simply to illustrate what the Tongan population would look like if fertility remained on a relatively high level in combination with a relatively high level of net out-migration. It also represents an important baseline, enabling us to compare the impact of changing fertility and migration, as in the other scenarios.

Scenario 2 (No migration)

Fertility: The estimated total fertility rate (TFR) of 4.7 in 1991 remains constant until the year 2006.

Mortality: the level of life expectancy gradually increases from 67.6 for males and 70.7 for females in 1986 to 72.2 and 76.1 in the year 2006, in accordance with the UN working model of mortality improvement.

Migration: It is assumed that there is no migration for the entire period 1991–2006.

This scenario is designed to show the impact of migration by comparing its results with Scenario 1. While we know that such a scenario is highly unlikely to happen, at least for the period 1991–2006, the relatively high rate of natural increase is illustrated.

Scenario 3 (Declining fertility, constant migration)

Fertility: TFR is assumed to decline from an estimated level of 4.7 in 1991 to 3.2 in 2006.

Mortality: The level of life expectancy gradually increases from 67.6 for males and 70.7 for females in 1986 to 72.2 and 76.1 in the year 2006, in accordance with the UN working model of mortality improvement.

Migration: There is a constant rate of out-migration of 3000 persons per year.

Like Scenario 4, this scenario is designed to indicate a more likely outcome, which includes the assumption of a further decrease in fertility. It is also useful because it indicates underlying levels of natural increase for each fertility level.

Scenario 4 (Declining fertility, declining migration)

Fertility: TFR is assumed to decline from an estimated level of 4.7 in 1991 to 3.2 in 2006.

Mortality: The level of life expectancy gradually increases from 67.6 for males and 70.7 for females in 1986 to 72.2 and 76.1 in the year 2006, in accordance with the UN working model of mortality improvement.

Migration: The rate of out-migration declines from 3000 persons per year in 1991 to zero in the year 2006.

This scenario highlights the importance of migration if its results are compared with those of Scenario 3, since it assumes a gradual reduction in out-migration.

4.3 Projection results

The results of projections under the four scenarios for the years 1996 and 2006 are compared with the 1986 Census population in Appendix Table 11. A comparison between the base year of the projections, 1991, and the end year for the four projection scenarios, 2006, is given in Table 5.

Table 5: Comparison of base (1991) and end (2006) years of population projections, Tonga

Scenarios	Year	Total pop. (000)	% under 15 years	% 15–59	% 60+	Median age (years)	Annual growth rate (%)
Base year	**1991**	**89.0**	**41.3**	**53.0**	**5.7**	**19.5**	**–1.23**
Projection outcomes							
Scenario 1	2006	81.0	42.2	54.1	3.7	19.4	–0.63
Scenario 2	2006	136.5	39.5	53.9	6.6	20.5	2.85
Scenario 3	2006	73.8	36.6	59.3	4.1	21.8	–1.25
Scenario 4	2006	99.0	35.5	58.6	5.9	22.1	0.71
Changes compared to base year 1991							
Scenario 1	2006	–8.0	+0.9	+1.1	–2.0	–0.1	+0.60
Scenario 2	2006	+47.5	–1.8	+0.9	+0.9	+1.0	+4.08
Scenario 3	2006	–15.2	–4.7	+6.3	–1.6	+2.3	–0.02
Scenario 4	2006	+10.0	–5.8	+5.6	+0.2	+2.6	+1.94

These projection scenarios highlight two key features:

— the impact of international migration on the size and growth of the population; and

— the impact of reduction in fertility and increasing longevity on the age-structure of the population.

Scenario 1

Table 5 indicates that if fertility stayed constant at its estimated 1991 level (TFR = 4.7) and there was a constant net out-migration of 3000 persons per year, Tonga would grow at the same pace as it did during the period 1986–1993, an annual rate of growth of –0.63 per cent. In the year 2006, the population would be 81,000.

In spite of relatively high constant fertility, the population would decrease because of the effect of out-migration. If the growth rate of Scenario 1 is compared with that of Scenario 2, where no migration but the same high rate of fertility are assumed, the effect of migration can be clearly seen. If Tonga was 'closed', so to speak, the population would grow quite fast, with an annual growth rate of 2.85 per cent.

Scenario 2

Based on the assumption of a constant total fertility rate of 4.7 and no migration during the entire projection period, the size of the total population is expected to increase to 136,500 with an annual growth rate of 2.85 per cent. The population would be double its present size in less than 25 years !

Scenario 3

If fertility gradually declined from 4.7 in 1991 to 3.2 in 2006, with a constant net out-migration of 3000 persons per year, as assumed in Scenario 3, the population would decrease, with an overall population growth rate of –1.25 per cent. The population in 2006 would amount to only 73,800 people, less than in 1986 (Appendix Table 11).

Scenario 4

In this scenario, both, fertility and migration are assumed to decline during the period 1991–2006. The total fertility rate is expected to decline from 4.7 to 3.2 (same as Scenario 3) and the number of out-migrants decreases from 3000 persons per year to zero in 2006. A comparison of the 2006 population of this scenario with that of Scenario 3 shows the effect of fertility. With a declining rate of migration, the population would grow by 0.71 per cent.

If the effect of migration is eliminated, as in Scenario 2 and partly in Scenario 4, the natural growth rate (the 'real growth') of the Tongan population is illustrated.

If the annual growth rate was somewhere between 2.36 per cent (declining fertility and no migration) and 2.85 per cent (constant fertility and no migration), a Tongan child would see the population double during its lifetime, in 24 to 30 years.

With a persistent high negative net migration of 3000 persons per year, as has been the case in the past, Tonga's relatively high natural growth would be counterbalanced, and its population could even decrease, as is shown in Scenarios 1 and 3.

5. OVERALL IMPLICATIONS FOR PLANNERS AND POLICY-MAKERS

1. The four population projection scenarios give us a population estimate for Tonga in 1996 of between 85,000 and 102,000 people. However, based on the estimate of 90,644 people in 1993 (by the MCH/FP staff), it would be surprising if the population was much higher now than that enumerated in 1986 (94,649). Since Tonga's population has probably decreased between 1986 and 1991 (from 94,649 to an estimated 89,000), despite its relative high fertility, the importance of international migration for the population of Tonga can be clearly seen. This unpredictable factor determines the size of the population for future years, because the other population components (mortality and fertility) usually change in a much more regular and gradual pattern. This highlights the vulnerability of Tonga's demography to fluctuations in the levels and patterns of international migration.

2. The estimates for the year 2006 range from 74,000 (Scenario 3) to 136,500 (Scenario 2). The zero migration assumption in Scenario 2 and the resulting high population are very unlikely to happen. Nevertheless, the relatively high variations in the 2006 population again stress the significant effect of migration in Tonga. The relatively high fertility would cause a rapid increase in Tonga's population, as Scenarios 4 and, especially, 2 demonstrate.

3. Fluctuations in international migration therefore have major implications for Tonga's development. From a macro-economic perspective, annual remittance transfers make massive contributions to the Tongan economy (foreign currency reserve; balance of payments). From a more people-oriented perspective, remittances contribute to household survival, and, for regular remittance recipients, to a better standard of living. For these reasons alone, the Tongan Government should be interested in accurate, regular monitoring of international migration.

4. Projection scenarios presented in this paper demonstrate that by the year 2006, the age structure of the Tongan population will have undergone some changes (see Table 5 and Appendix Table 11). There will be fewer people under the age of 15 than in 1991 (except in Scenario 1) and more people in the adult ages. As a result, in the year 2006, the median age of the population will be about 21 years, compared to 19 years in 1991. Scenarios 3 and 4 illustrate more clearly the impact of reduction in fertility and increasing longevity on the age structure of the population. Between 1991 and 2006, the proportion of population under the age of 15 will be reduced by between 4.7 and 5.8 per cent (Table 5).

On the other hand, the proportion of people aged 15–60 will increase by between 6.3 and 5.6 per cent.

5. Changes in Tonga's age structure will influence the proportion and size of its school-age population[23] (see Appendix Table 11). The proportion of the population of school-age (6–19 years) will be smaller (on average 29 % in 2006 compared to 34% in 1986). This is mostly due to declining trends in fertility and increasing length of life. However, where population growth is faster (Scenario 2), the fact that the school-age population is a smaller proportion of the total does not mean that the actual numbers are smaller.

6. The implications of the projected school-age population in the year 2006 under the four different migration assumptions are summarised in Table 6 in terms of number of teachers, classrooms and cost. If population growth is low (Scenarios 3 and 1), the proportion of the population of school age is lower. This results in reduced requirements for teachers, classrooms and consequently costs.[24] Faster population growth (Scenario 2) results in small increases in the total numbers of the school-age population, and increases in the requirements for teachers, classrooms and expenditure.

Table 6: Implications of the projected school-age population in the year 2006 under the four projection scenarios

Scenario	School-age population	Teachers (1)	Classrooms (2)	Cost of teachers (3)	Change in cost
Base year 1986	**31,874**	**1,062**	**1,062**	**4,248,000**	**0**
Scenario 1	24,079	803	803	3,212,000	–1,036,000
Scenario 2	39,218	1,307	1,307	5,228,000	+980,000
Scenario 3	21,637	721	721	2,884,000	–1,364,000
Scenario 4	28,895	963	963	3,852,000	–396,000

(1) Teacher:student ratio = 1:30.

(2) Teacher:classroom ratio = 1:1.

(3) Annual salary of a teacher = Paanga 4000 (assuming constant prices).

The assumed change in age structure would mean a much larger working-age population (both in proportion and in absolute numbers), demanding more employment opportunities, both public and private.

7. If fertility declines further as assumed in Scenarios 3 and 4, the dependency ratio will drop to about 64 per cent and the working population will have

to support fewer people. In Scenarios 1 and 2, with constant fertility, the dependency ratio will only decrease slightly.

8. The numbers of the working-age population (15–60 years) would increase until the year 2006 only under Scenarios 2 and 4, where no or a reduced rate of migration is assumed (see Appendix Table 11). The working-age population would grow by between 8,000 (Scenario 4) and 23,000 people (Scenario 2). In order to maintain the 1986 employment:population ratio of 39.53 per cent, between 3,100 and 9,100 more jobs would be needed by the year 2006. This again underlines the importance of migration and the opportunities (employment, education, etc.) which the prospects of migrating to overseas countries represent for Tonga.

9. Since the option of overseas migration may not be available forever, a lowering of fertility levels may have to be considered more seriously as a long-term policy option. Family planning services, including widespread information and counselling services, seem to be a priority area. Such services are particularly important for teenagers. Availability and accessibility of these services, especially for women, will empower them to make conscious decisions about the number and spacing of their children.

10. Reliable population statistics (vital statistics, migration data) provide the basis for reliable development planning. They are indispensable for keeping information on population size, growth and indicators up to date and form the basis for sensible population projections.

The impact and success of any policies, programmes or projects aimed at influencing any of the population parameters (fertility, mortality, migration) could be evaluated with the help of a complete, reliable vital registration system. For example, if a new immunisation strategy and/or drug was introduced, its success could be tested by using data on infant deaths to check any change in trends following its introduction.

11. Several improvements could be made to the collection of population data. The two most important, and much-needed, changes concern the introduction of a system to collect reliable and timely migration statistics and improvements in vital registration (particularly of mortality, including information on causes of death).

Should these changes prove impossible, or politically undesirable, another option would be to undertake censuses at five-year intervals. Using the appropriate demographic methodologies, it would be possible to calculate the desired population data by comparing the two most recent censuses. The disadvantages of this option are that the calculations can only be done after the analysis of the

latest census is completed, and that a census is more time-consuming and costly than an efficient vital registration system.

12. While availability of good data is one pre-condition for responsible development planning, data analysis and utilisation are of equal importance. This also requires adequately-trained staff. Population projections are an essential planning tool, and an improved knowledge of the interrelationship between population and development is essential to provide a firm basis for undertaking demographic projections and scenario-building. The SPC Population Programme's in-country workshops for planners are a first attempt to contribute to national capacity building in this area. The preparation of specific (and more detailed and sophisticated) projections in such important sectors as education and manpower planning requires close co-operation between demographers, planners and policy-makers.

13. Incorporation of population variables in policy-making and decision-making process will certainly enhance the effectiveness of these processes. From various official statements[25], it appears that the Tongan Government is keen to incorporate population variables in its policy-making and decision-making framework. It has also been indicated that the Government is in the process of developing a national population policy stating intentions to influence or action designed to directly affect demographic processes. We encourage concrete action in this direction.

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APPENDIX TABLES

Appendix Table 1: Age and sex composition of population, 1986

Age-group	Males	Females	Persons	Sex ratio*	Cum. (%)
0–4	7,155	6,761	13,916	105.8	14.70
5–9	6,535	6,139	12,674	106.5	28.09
10–14	6,205	5,647	11,852	109.9	40.62
15–19	6,459	5,931	12,390	108.9	53.71
20–24	4,548	4,403	8,951	103.3	63.16
25–29	2,967	3,103	6,070	95.6	69.58
30–34	2,359	2,727	5,086	86.5	74.95
35–39	1,868	2,249	4,117	83.1	79.30
40–44	1,807	2,037	3,844	88.7	83.36
45–49	1,688	1,882	3,570	89.7	87.13
50–54	1,582	1,666	3,248	95.0	90.56
55–59	1,378	1,410	2,788	97.7	93.51
60–64	1,069	1,034	2,103	103.4	95.73
65–69	815	791	1,606	103.0	97.43
70–74	544	517	1,061	105.2	98.55
75+	583	717	1,300	81.3	99.92
Not stated	49	24	73	–	100.00
Total	47,611	47,038	94,649	101.2	

* Sex Ratio: Number of males per 100 females.

Source: Kingdom of Tonga. (1991). Population Census 1986. Table G4, p. 11.

Appendix Table 2: Age ratios by sex, 1986

Age-group	Males		Females	
	Ratio	Deviation	Ratio	Deviation
5–9	98.4	–1.6	99.0	–1.0
10–14	97.2	–2.8	95.8	–4.2
15–19	112.5	+12.5	111.6	+11.6
20–24	97.8	–2.2	98.1	–1.6
25–29	89.6	–10.6	90.6	–9.1
30–34	98.9	–1.1	101.1	+1.1
35–39	91.7	–8.3	95.6	–4.4
40–44	101.2	+1.2	99.4	–0.6
45–49	100.2	+0.2	101.5	+1.5
50–54	102.1	+2.1	100.5	+0.5
55–59	102.8	+2.8	103.0	+3.0
60–64	97.7	+2.3	96.0	–4.0
65–69	101.5	+1.5	101.2	+1.2
70–74	96.8	–3.2	96.4	–3.6
75–79	91.7	–8.3	87.2	–12.8

Appendix Table 3: Distribution of population aged five years and over by educational attainment, 1976 and 1986

Educational level	1976 (%)	1986 (%)
No schooling	4.1	3.2
Primary	49.8	39.5
Secondary	44.5	55.8
Tertiary	1.6	1.5
Total	100.0	100.0

Source: Kingdom of Tonga. (1991). Population Census 1986. Table 9, p. xvii.

Appendix Table 4: School participation rates by age groups and sex, 1986

Age-group	Males (%)	Females (%)
6–9	97.4	97.8
10–14	94.9	94.8
15–19	61.6	65.0
20–24	12.0	10.1
Total	69.2	69.3

Source: Kingdom of Tonga. (1991). Population Census 1986. Table 12, p. xix.

Appendix Table 5: Number of registered marriages by sex and age, 1990–1992

Age-group	1990		1991		1992		Total 1990–1992		Sex ratio
	Males	Females	Males	Females	Males	Females	Males	Females	
15–19	50	162	41	120	58	154	149	436	2.93
20–24	276	299	255	287	322	354	853	940	1.10
25–29	195	131	204	140	229	182	628	453	0.72
30–34	76	55	75	49	87	53	238	157	0.66
35–39	37	30	31	30	40	28	108	88	0.81
40–44	26	12	20	17	25	8	71	37	0.52
45–49	14	9	9	5	12	8	35	22	0.63
50+	26	2	20	6	24	11	70	19	0.27
NS	8	8	13	14	9	8	30	30	1.00
Total	708	708	668	668	806	806	2,182	2,182	1.00

Source: Kingdom of Tonga. (1993). Demographic Analysis of 1986 Census Data: Fertility, Mortality and Population Projections. Volume II.

Appendix Table 6: Proportions never-married and ever-married* by age groups for males and females, 1986

Age-group	Males		Females	
	Never married	Ever married	Never married	Ever married
0–4	100.00	0	100.00	0
5–9	100.00	0	100.00	0
10–14	100.00	0	100.00	0
15–19	97.61	02.39	94.04	06.13
20–24	79.50	20.50	66.74	34.94
25–29	44.89	55.11	30.05	69.95
30–34	23.43	76.57	14.69	85.31
35–39	13.55	86.45	9.59	90.41
40–44	9.02	90.98	8.27	91.73
45–49	7.77	92.23	6.80	93.20
50–54	6.68	93.32	6.42	93.58
55–59	6.11	93.89	7.63	92.37
60–64	6.10	93.90	6.18	93.82
65–69	6.02	93.98	5.91	94.09
70–74	5.11	94.89	4.31	95.69
75+	5.38	94.62	4.80	95.20
Total ages 15+	46.22	53.78	37.77	62.52

* Ever married includes currently married, widowed and divorced categories.

Source: Calculated from data in Table G7, pages 28–29, Kingdom of Tonga. (1991).

Appendix Table 7: Population aged 15–64 years by status of economic activity and sex, 1986

Sex	Pop. aged 15–64 *	Economically active population			Not economically active	Activity not stated
		Employed	Unemployed	Total economically active		
(1)	(2)	(3)	(4)	(5)	(6)	(7)
Males	25,725	16,609	1,202	17,811	7,131	177
Females	26,442	4,015	928	4,943	20,847	146
Persons	52,167	20,624	2,130	22,754	27,978	323
	%	*% labour force*	*% labour force*		*% population aged 15–64*	
Males	*	93.3	6.7	70.9	28.4	0.7
Females	*	81.2	18.8	19.0	80.4	0.6
Persons	*	90.6	9.4	44.6	54.8	0.6

Source: Data were taken from Table G4, p. 11, Table G15, pp. 53–54 and Table G16, pp. 69–70, Kingdom of Tonga 1991, Population Census 1986.

* The sum of numbers in columns (5), (6) and (7) should be equal to the number in column (2). However, due to discrepancies in the 1986 Census report, these numbers do not add up correctly. The sum of columns (5), (6) and (7) has therefore been used to calculate percentages.

Appendix Table 8: Time series data on vital statistics and migration, 1980–1994

Year	Total population	Annual growth rate	Registered births	Registered deaths	Crude birth rate	Crude death rate	Rate of natural increase	Net migration rate	Net migrants
Average (1986–93)	92,646	–0.62			26.58	4.31	2.23	–2.84	–2,636
1994			2,770	388					
1993	90,644 (d)	0.3 (i)	2,378	378	26.2	4.2	2.2	–1.9	–1,722
1992	90,369 (d)	2.1 (h)	2,127	418	23.5	4.6	1.9	0.2	181
1991	88,508 (d)	–1.4 (g)	2,372	375	26.8	4.2	2.3	–3.7	–3,275
1990	89,773	–1.4 (g)	2,548	434	28.4	4.8	2.4	–3.8	–3,411
1989	91,056 (c)	–1.3 (f)	2,316	388	25.4	4.3	2.1	–3.4	–3,096
1988	92,238	–1.3 (f)	2,476	351	26.8	3.8	2.3	–3.6	–3,321
1987	93,436	–1.3 (f)	2,696	398	28.9	4.3	2.5	–3.8	–3,551
1986	94,649 (b)	0.5 (e)	2,396	348	25.3	3.7	2.2	–1.7	–1,609
1985	94,182	0.5 (e)	2,659	493	28.2	5.2	2.3	–1.8	–1,695
1984	93,718	0.5 (e)	2,714	459	29.0	4.9	2.4	–1.9	–1,781
1983	93,256	0.5 (e)	2,892	418	31.0	4.5	2.7	–2.2	–2,052
1982	92,796	0.5 (e)	2,627	590	28.3	6.4	2.2	–1.7	–1,578
1981	92,339	0.5 (e)	2,809	482	30.4	5.2	2.5	–2.0	–1,847
1980	91,884	0.5 (e)	2,730	527	29.7	5.7	2.4	–1.9	–1,746
1976	90,085 (a)								

(a) 1976 census.
(b) 1986 census.
(c) Estimated by the Tongan Department of Health.
(d) House-to-house count by the Department of Health, MCH/FP staff.
(e) 1976–1986.
(f) 1986–1989.
(g) 1989–1991.
(h) 1991–1992.
(i) 1992–1993.

Appendix Table 9: Death rates and life expectancy by age and sex, 1976–1986

Age	Females		Males	
	Death rate (m(x))	Life expectancy (years)	Death rate (m(x))	Life Expectancy (years)
0	.02660	70.7	.02661	67.6
1	.00155	71.5	.00103	68.4
5	.00068	68.0	.00089	64.7
10	.00053	63.2	.00076	60.0
15	.00085	58.4	.00153	55.2
20	.00124	53.6	.00190	50.6
25	.00151	48.9	.00194	46.1
30	.00180	44.3	.00220	41.5
35	.00232	39.6	.00280	36.9
40	.00317	35.1	.00402	32.4
45	.00462	30.6	.00621	28.0
50	.00687	26.2	.00967	23.8
55	.01030	22.1	.01526	19.9
60	.01633	18.1	.02376	16.2
65	.02704	14.4	.03703	12.9
70	.04592	11.1	.05858	10.1
75	.07745	8.4	.09301	7.6
80	.16252	6.2	.17395	5.7

Source: Based on census data from Muthiah (unpublished). p. 32.

Appendix Table 10: Primary health care indicators, 1993

Indicator	Per cent
Population with access to safe drinking water	100.0
Population with access to adequate excreta disposal facilities	72.0
Immunisation coverage at 1 year of age	89.0
Pregnant women who have been immunised with tetanus toxoid	69.3
Population with access to treatment of common illnesses and injuries and a regular supply of drugs within one hour's walk or travel	100.0
Pregnant women who attended ante-natal clinic	97.4
Deliveries conducted by trained health personnel	92.1
Infants attended by trained personnel	97.5
Women of the target female population using contraception	35.7

Source: Government of Tonga. (1994). Report of the Minister of Health for the year 1993. p. 5

Appendix Table 11: Population projections for Tonga by age-group, 1996 and 2006, under four varying scenarios*

Indices	1986	1996				2006			
		Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 1	Scenario 2	Scenario 3	Scenario 4
Population size	94,649	86,148	102,325	85,271	87,956	80,965	136,501	73,837	99,039
< 15	38,471	35,495	40,856	34,617	35,506	34,173	53,929	27,045	35,179
60+	6,075	4,191	5,844	4,191	4,468	2,985	8,990	2,985	5,815
School age (6–19)	31,874	26,647	31,590	26,680	27,503	24,079	39,218	21,637	28,895
Working age (15–60)	50,103	46,463	55,616	46,463	47,988	43,806	73,582	43,806	58,044
Population structure									
% <15	40.7	41.2	39.9	40.6	40.3	42.2	39.5	36.6	35.5
% 60+	6.4	4.9	5.7	4.9	5.1	3.7	6.6	4.1	5.9
% school age (6–19)	33.7	30.9	30.9	31.3	31.3	29.7	28.7	29.3	29.2
% working age (15–60)	52.9	53.9	54.4	54.5	54.6	54.1	53.9	59.3	58.6
Median age (years)	18.6	19.4	19.7	19.6	19.7	19.4	20.5	21.8	22.1
Dependency ratio (15–59)	88.9	85.4	84.0	83.5	83.3	84.8	85.5	68.6	70.6
Dependency ratio (15–64)	81.3	80.8	77.8	79.0	78.4	80.0	77.8	64.1	64.1
Annual growth rate (%)	0.5	–0.94	0.78	–1.04	–0.73	–0.78	1.83	–1.24	0.23
Sex ratio	101.2	95.8	99.4	95.7	96.4	90.5	100.7	89.2	96.1

* Assumptions discussed in Section 4.2.

FOOTNOTES

[1] A house-to-house population count by Tongan MCH/FP staff yielded a national population total for 1993 of 90,644 people, compared to 88,508 and 90,369 for the years 1991 and 1992 respectively (Katoanga, 1994). The MCH/FP population data appear to be consistent from year to year, and imply a decline in the size of the total population between 1986 and 1990 through international migration.

[2] It has been estimated that mortality for children under the age of five years declined 30 per cent in a decade, from 44 per 1000 in 1975 to about 31 per 1000 in 1984 (Kingdom of Tonga, 1993: 19).

[3] Working-age population is defined as age-group 15–64 years; children are defined as age-group 0–14 years; and aged persons are referred to age-group 65+.

[4] The New Zealand Government opened its borders for three months.

[5] Sex ratio is defined as the number of men per 100 women.

[6] Defined as the number of employed persons aged 15–64, to the total population of the same age-group.

[7] For a more detailed discussion on economic activity by industry and occupation, please refer to the 1986 Census report (Kingdom of Tonga, Statistics Department, 1991: Tables 17–22).

[8] Such as the most recent development plans and the country paper prepared for the International Conference on Population and Development in Cairo, 1994.

[9] The annual growth rate in the years immediately following the 1986 census could have been even lower, if the MCH/FP population statistics prove to be accurate.

[10] Crude Birth Rate (CBR) is the total number of births in a year per 1000 mid-year population.

[11] While the situation has slightly improved since early 1995, when the Statistics office started recording migration flows from passengers manifests, this system does not yield any information on the age of migrants.

[12] While age at marriage is frequently used by demographers world-wide as a determinant of fertility, some caution is advised when using this concept

uncritically in an environment where child-birth is not as directly linked to marriage.

[13,14] Country Paper, Port Vila Conference, 1993.

[15] Much care is advised here, as small numbers of infant deaths (a reported total of 33 infant deaths for 1993) make it quite difficult to do a sensible, detailed sub-regional analysis.

[16] The 1986 rate of natural increase appears a little on the low side. The figure for registered births in that year suggests that there may have been some under-reporting of births.

[17] Tongan people in New Zealand, Statistics New Zealand (1995):11.

[18] Pacific Islanders in New Zealand, Espaces, Populations, Sociétés, 1994 (2):187–200.

[19] Unfortunately, we have been unable so far to obtain similar data for Australia and the US.

[20] Country Paper for Meeting of Senior Officials on Population and Sustainable Development in the Pacific, 6–8 September, Port Vila, Vanuatu, 1993.

[21] Communication from the Prime Minister's Office, Kingdom of Tonga, in reply to our enquiry about top three country priorities, 10 May 1995.

[22] Haberkorn, G. (1995). Prioritizing priorities: Pacific Island population developments and their implications for public policy., *New Zealand Population Review*, Vol. 21 (1–2):1–26.

[23] The primary-school-age population is calculated by adding half of the age-groups 6 and 12 to those aged 7–11 years. However, the 1986 Census data show that half of the 5-year-old children are attending school already. The school-age population will have to be recalculated if these findings are confirmed.

[24] This assumes constant prices and no change in the teacher:student ratio and teacher:classroom ratio.

[25] Country Paper for Meeting of Senior Officials on Population and Sustainable Development in the Pacific, 6–8 September, Port Vila, Vanuatu, 1993. Country Statement, International Conference on Population and Development, Cairo, Egypt, 5–13 September 1994.