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KIRIBATI 2010 CENSUS
Volume 2: Analytical Report

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Content

Preface

This 'Kiribati 2010 census analytical report' contains analyses of data collected during the 2010 Population and Housing Census . The purpose of the report is to summarise the census results in order to provide planners, policy-makers, researchers and other census users with updated and accurate demographic and socioeconomic statistical information regarding Kiribati's population at the time of the 2010 census. This report is the second output from the Kiribati 2010 Population and Housing Census, and is known as Volume 2 (Volume 1 contains the basic census tables only).

The main analyses presented in Chapters 2 through 6 examine Kiribati's population size and growth, population distribution and composition, urbanisation, age and gender composition, and the three known population processes — fertility, mortality and migration. The social characteristics of the population are discussed in Chapter 7, while Chapter 8 summarises some of Kiribati's housing characteristics and conditions.

The analysis in each chapter focuses on responses to questions from the 2010 Population and Housing Census questionnaire; and where possible, the data are compared with previous census results — especially the most recent 2005 census — to explore the way in which Kiribati's population characteristics have changed over the intercensal period. Summary results include all of Kiribati, the urban area (South Tarawa only), and rural areas (comprising 21 outer islands). However, the urbanisation analysis includes Kiritimati Island as another urban area in order to examine and determine the more accurate level and tempo of urbanisation in Kiribati.

The Kiribati National Statistics Office will later produce an Island Profile Report for each island. The Island Profile Reports will contain descriptive analyses of the demographic, socioeconomic, household characteristics and housing conditions of each island's population.

The 2010 census data provide a rich information base that can be used to produce other demographic, social and economic analyses that are not contained in this report but which are critical for the development of Kiribati. Hence, all census users and researchers are encouraged to make further contributions to theses analyses. Those who are willing to undertake further analysis can address their request to the Kiribati National Statistics Office. All census data users are requested to contact the Kiribati National Statistics Office in Bairiki, Tarawa for other census data requirements that have not been addressed in this report.

Tekena Tiroa
Republic Statistician
Republic of Kiribati
July 2012

Acknowledgements

I would also like to take this opportunity to thank all of the staff of the Kiribati National Statistics Office and the Kiribati census team led by Ms Jenny Keari Tonganibeia (Kiribati Census Commissioner), Ms Aritita Tekaieti (Deputy Census Commissioner), Mr Tebukabane Toki and Ms Teimaro Boutu (both senior census officers) for their hard work and willingness to work extra hours behind the scene to ensure that the census operations proceeded accordingly. I also acknowledge the enormous work done by the census supervisors, enumerators, data operators and census clerical staff — without their dedication and commitment to their work, this census would not have been a success.

Last but not least, a very big *kam raba* to every individual in Kiribati who happily participated in the census interview during for their support, understanding and patience in providing very valuable information that is been compiled, analysed and presented in this report.

Te mauri, te raoi ao te tabomoa

Tekena Tiroa
Republic Statistician
Kiribati National Statistics Office
July 2010

Summary of main indicators

Indicators	2010		
	Total	Males	Females
Total enumerated population (November 2010)	**103,058**	**50,796**	**52,262**
Urban population (South Tarawa)	50,182	24,233	25,949
Percent urban (%)	48.7		
Urban growth rate (%)	4.4		
Urban population (South Tarawa and Kiritimati))	55,768		
Percent urban (%)	54.1		
Urban growth rate (%)	4.1		
Rate of growth (%) of total population, 2005-2010	2.2		
Rate of natural increase (CBR – CDR)	2.3		
Population density (number of persons per square km)			
Kiribati	142		
South Tarawa	3,184		
Median age (in years)	21.6	20.7	22.6
Per cent of population younger than 15 years of age	36	38	35
Per cent of population 15-24 years of age (youth)	21	21	20
Per cent of population 15-59 years of age	58	58	59
Per cent of population 60 years and older	5	5	6
Age dependency ratio	71		
Sex ratio	97		
Labor market activity	**39,034**	**21,186**	**17,848**
Employed population (number)	*27,096*	*15,333*	*11,763*
Paid cash workers	*19,593*	*10,762*	*8,831*
Formal employment	13,440	7,759	5,681
Producing goods for sale	6,153	3,003	3,150
Unpaid workers	*7,503*	*4,571*	*2,932*
Voluntary workers & family unapid business workers	3,493	2,242	1,251
Subsistence workers - producing good for own consumption	4,010	2,329	1,681
Unemployed (number)	11,938	5,853	6,085
Non-labor force	**26,840**	**10,547**	**16,293**
Students	5,377	2,561	2,816
Persons engaged in Home duties	9,738	2,771	6,967
Inactive persons	5,845	2,838	3,007
Retired persons	5,110	1,993	3,117
Disabled or sick persons	770	384	386
Labour force participation rate	59.3	66.8	52.3
Employment-population ratio	29.7	33.9	25.9
Unemployment rate (%)	30.6	27.6	34.1

Education			
School enrolment rates of 6-15 year olds (%)	90	86	92
Proportion of population 15 years and older with secondary	59.6	59.7	59.5
or higher education			
Proportion of total population with secondary or	31.1	30.7	31.5
tertiary qualification			
Proportion of population 15 years and older with no education	10.0	9.5	10.6
Proportion of population 15 years and older with primary education	30.3	30.8	29.8
Literacy rate (15+)	97.7	97.7	97.8
Internet use (15+)	14.7	14.5	14.9
Substance use, % (15+)			
Smoking tobacco	44.0	58.2	30.8
Acolhol consumption	22.3	40.2	5.6
Kava consumption	23.1	42.3	5.1
Fertility			
Number of births, 2010	3,203		
Crude Birth Rate (CBR), 2010	31.1		
Total Fertility Rate (TFR), 2009-2010			3.9
Teenage Fertility Rate, 2009-2010			4.9
Mean Age at Childbearing, 2010			29.2
Average age at first marriage (SMAM), 2010	22.7	24	21.5
Mortality			
Estimated Number of deaths, 2010	808		
Crude Death Rate (CDR), 2010	7.8		
Life expectancy at birth, (e0)	63.2	59.7	67.5
Infant Mortality Rate (IMR)	45	50	39
Child mortality Rate (1q5)	14	16	11
Under 5 mortality (q5)	59	66	50
Orphanhood			
Father's dead	36		
Mother's dead	25		
International Migration (2000-2005)	0.0		
Households			
Number of private households	16,043		
Number of persons in private households	99,960	49,182	50,778
Average household size	6.2		
Number of institutions (non-private households)	97		
Number of persons in institutions	3,908		
Households with Improved water and toilet access(%)			
Main source of drinking water			
Improved	63.8		
Not improved	36.2		
Main type of toilet facility			
Improved	48.7		
Not improved	51.3		

Map: Pacific region, Kiribati
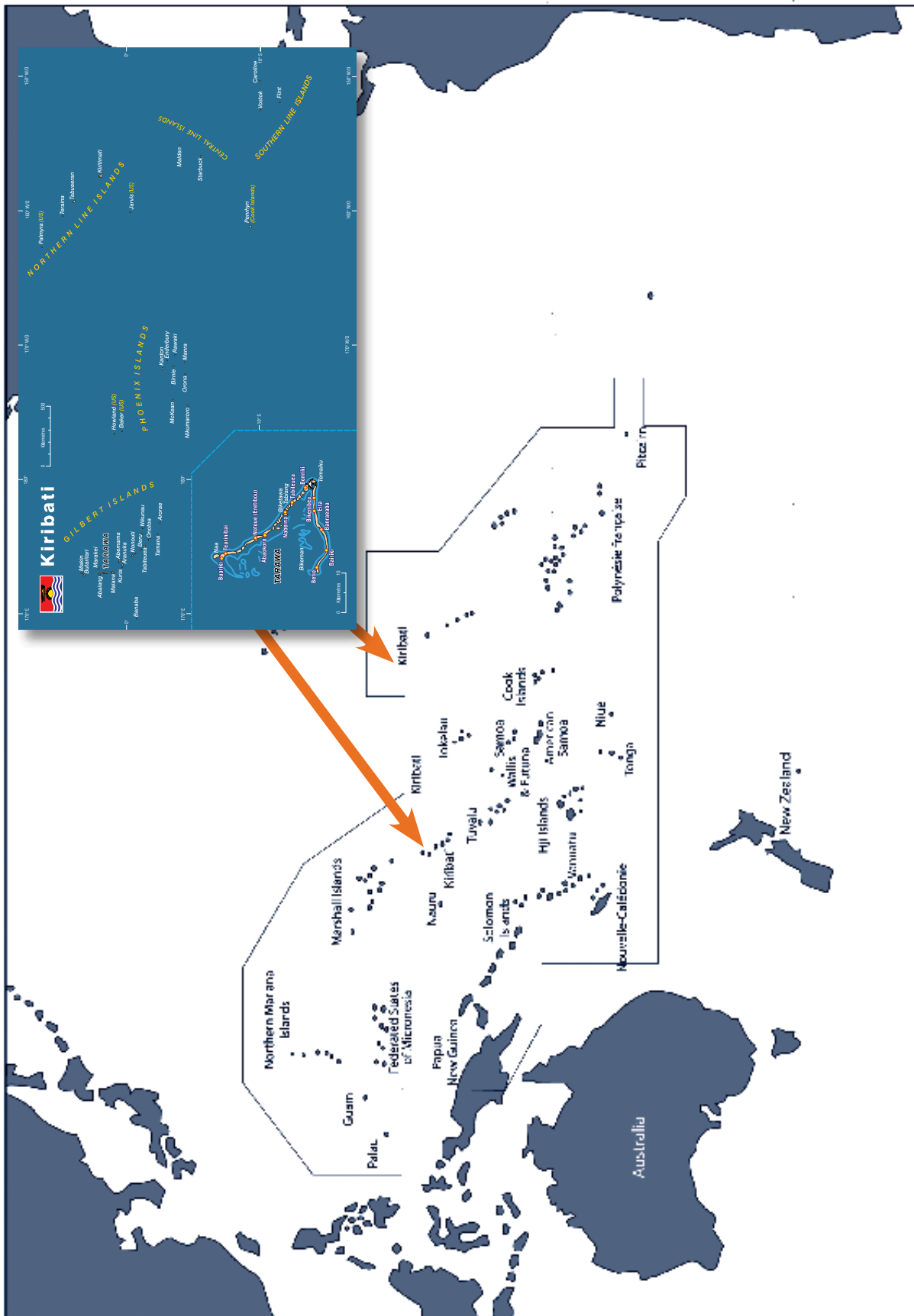
Chapter 1: Introduction

1.1 Geography

Kiribati consists of three groups of 33 coral atolls: the Gilbert Islands, Phoenix Islands, Line Islands, and one isolated volcanic island, Banaba (or Ocean Island). The islands are spread over an area of 5 million km² of the central Pacific Ocean and have a total land area of 810.5 km2. Kiribati, which was previously administered by Britain, became independent on 12 July 1979. Tarawa, the capital and most populous island, is about 1,800 km north of Suva, Fiji.

1.2 Kiribati housing and population censuses

Population censuses in Kiribati have been conducted in 1963, 1968, 1973, 1978, 1985, 1990, 1995, 2000, 2005 and 2010. In 1990, the Kiribati National Statistics Office (KNSO) took full responsibility for conducting and administering censuses. Censuses in Kiribati closely follow the *de facto* census methodology, which enumerates people as to where they spent the census night.

1.3 Background of the 2010 census report

As with past censuses, the 2010 Kiribati census was the responsibility of KNSO. The compilation of this report was a joint effort between KNSO and the Statistics for Development Programme of the Secretariat of the Pacific Community (SPC). The Kiribati Census Commissioner, Jenny Tonganibeia, drafted some of the chapters of this report.

The main purpose of this report is to summarise and present the results of the 2010 census, covering all of the topics (questions) included in the census, and where possible, to also illustrate comparisons with earlier census results.

Census data users are requested to contact either KNSO or SPC's Statistics for Development Programme for further information.

KNSO	SPC Statistics for Development Programme
Ministry of Finance and Economic Development PO Box 67 Bairiki, Tarawa Kiribati Telephone: +686 21816 Fax: +686 21307 Email: statistics@mfep.gov.ki	Secretariat of the Pacific Community BP D5, 98848 Noumea Cedex New Caledonia Telephone: +687 26 20 00 Fax: +687 26 38 18 Email: Stats&Demog@spc.int http://www.spc.int

Chapter 2: Population size, growth, distribution and composition

2.1   Introduction

Data regarding the size, composition and location of a country's population are critical statistics that enable governments to make informed decisions, plan and budget effectively, and monitor development progress. An understanding of population trends is essential in assessing probable future developments, and developing policies and plans to provide or improve access to services (health and education) and infrastructure (housing, water, sanitation, roads and transport). Such information is provided through periodic population and housing censuses, which have particular value if undertaken every five years (as is the case of Kiribati), as they then provide important insights into the country's population dynamics.

2.2   Total population size

The 2010 Kiribati census recorded a total population of 103,058, reflecting nearly a fourfold increase since the first Kiribati census in 1931, which reported 29,671 people (Fig. 2.1). Over the past five years, Kiribati's population has increased by 11,000 people. The current population is made up of 50,796 males and 52,262 females.

Figure 2.1: Population of Kiribati and South Tarawa, 1931–2010
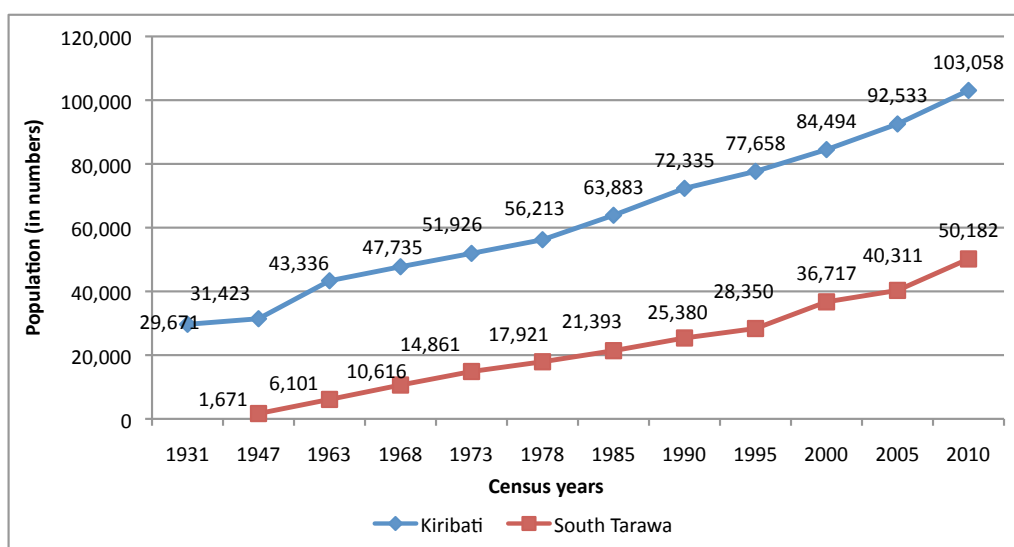
Figure 2.1 also provides information about corresponding developments of South Tarawa's population, Kiribati's capital and main urban area, highlighting an even more expansive population growth, from a mere 1,671 in 1947 to 50,182 in 2010. The magnitude of this rapid population growth is further substantiated by the fact that its population increased by 9,871 between 2005 and 2010, representing 94% of Kiribati's total population growth.

2.3   Population size by island group

In 2010, South Tarawa had the largest portion of Kiribati's total population at 49%, followed by the rest of the Gilbert group at 42%, and the Line and Phoenix group at 9%. For the purposes of this report, however, 'urban' refers to South Tarawa and data for Kiritimati falls under the rural category. Kiritimati Island is also considered to be an urban area; therefore, adding its population of 5,586 to the South Tarawa's population of 50,182, means that Kiribati's overall population has become more urban than rural in recent years. These developments — featuring South Tarawa's impressive population growth since the 1990s, relative to a more modest increase in the rural population — (illustrated in Table 2.1), reflect a doubling of South Tarawa's population in just 20 years relative to a more modest 11% growth of Kiribati's rural population during the same period.

Figure 2.2: Kiribati population size by island group, 1985–2010
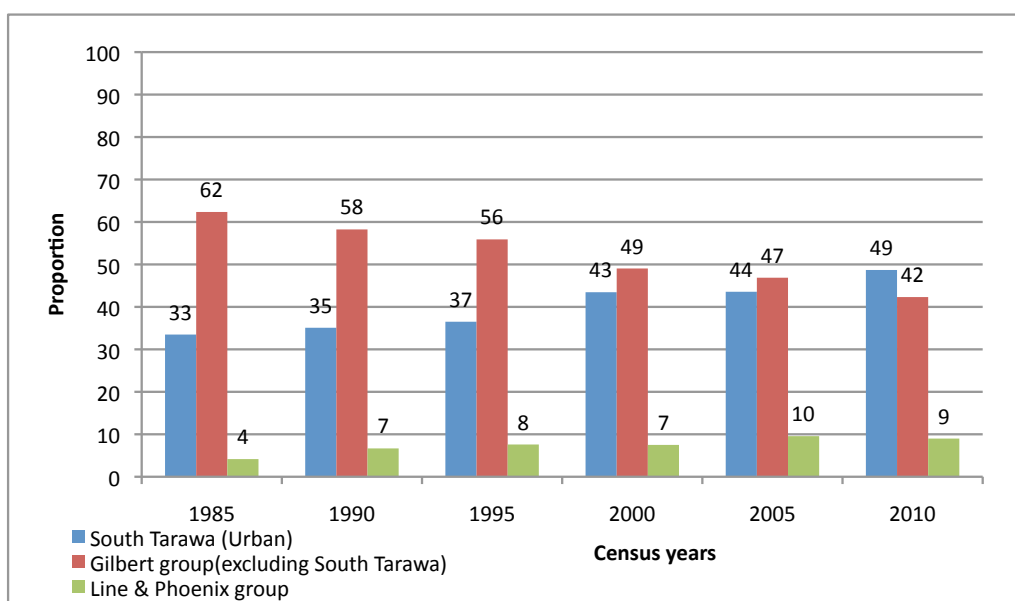
Table 2.1: Rural and urban (South Tarawa) population growth, 1990–2010

	South Tarawa	Rural	Total
1990			
Males	12,529	23,241	**35,770**
Femals	12,851	23,714	**36,565**
1995			
Males	13,925	24,553	**38,478**
Females	14,425	24,755	**39,180**
2000			
Males	17,822	23,834	**41,656**
Females	18,895	23,953	**42,848**
2005			
Males	19,435	26,177	**45,612**
Females	20,876	26,045	**46,921**
2010			
Males	24,233	26,563	**50,796**
Females	25,949	26,313	**52,262**

2.4 Population growth

Disaggregating these population developments across all of Kiribati (as shown in Table 2.2) highlights the key role played by South Tarawa in Kiribati's population dynamics. South Tarawa's population increased by a very high annual growth rate of 4.4% between 2005 and 2010, relative to a near stagnating rural population growth of 0.2%. The latter, however, is by no means representative of rural population growth, as shown by variations ranging from annual population declines of -5.7% on Makin and -5.2% on Tabuaeran, to high annual increases of +7.6% on Teeraina and +5.6% on Butaritari. Tabuaeran's decline could be the result of the closure of the secondary school, including boarding facilities, sometime after 2005 — a development that may have also impacted growth on neighbouring Teeraina.

Table 2.2: Population size and growth by islands, 1985–2010

Island/region	Census total population				Population change								
					(in numbers)			(in %)			Annual growth rate		
	1995	2000	2005	2010	1995-2000	2000-2005	2005-2010	1995-2000	2000-2005	2005-2010	1995-2000	2000-2005	2005-2010
Banaba	339	276	301	295	-63	25	-6	-18.6	9.1	-2.0	-4.1	1.7	-0.4
Makin	1,830	1,691	2,385	1,798	-139	694	-587	-7.6	41.0	-24.6	-1.6	6.9	-5.7
Butaritari	3,909	3,464	3,280	4,346	-445	-184	1,066	-11.4	-5.3	32.5	-2.4	-1.1	5.6
Marakei	2,724	2,544	2,741	2,872	-180	197	131	-6.6	7.7	4.8	-1.4	1.5	0.9
Abaiang	6,020	5,794	5,502	5,502	-226	-292	0	-3.8	-5.0	0.0	-0.8	-1.0	0.0
North Tarawa	4,004	4,477	5,678	6,102	473	1,201	424	11.8	26.8	7.5	2.2	4.8	1.4
South Tarawa	28,350	36,717	40,311	50,182	8,367	3,594	9,871	29.5	9.8	24.5	5.2	1.9	4.4
Maiana	2,184	2,048	1,908	2,027	-136	-140	119	-6.2	-6.8	6.2	-1.3	-1.4	1.2
Abemama	3,442	3,142	3,404	3,213	-300	262	-191	-8.7	8.3	-5.6	-1.8	1.6	-1.2
Kuria	971	961	1,082	980	-10	121	-102	-1.0	12.6	-9.4	-0.2	2.4	-2.0
Aranuka	1,015	966	1,158	1,057	-49	192	-101	-4.8	19.9	-8.7	-1.0	3.6	-1.8
Nonouti	3,042	3,176	3,179	2,683	134	3	-496	4.4	0.1	-15.6	0.9	0.0	-3.4
North Tabiteuea	3,383	3,365	3,600	3,689	-18	235	89	-0.5	7.0	2.5	-0.1	1.4	0.5
South Tabiteuea	1,404	1,217	1,298	1,290	-187	81	-8	-13.3	6.7	-0.6	-2.9	1.3	-0.1
Beru	2,784	2,732	2,169	2,099	-52	-563	-70	-1.9	-20.6	-3.2	-0.4	-4.6	-0.7
Nikunau	2,009	1,733	1,912	1,907	-276	179	-5	-13.7	10.3	-0.3	-3.0	2.0	-0.1
Onotoa	1,918	1,668	1,644	1,519	-250	-24	-125	-13.0	-1.4	-7.6	-2.8	-0.3	-1.6
Tamana	1,181	962	875	951	-219	-87	76	-18.5	-9.0	8.7	-4.1	-1.9	1.7
Arorae	1,248	1,225	1,256	1,279	-23	31	23	-1.8	2.5	1.8	-0.4	0.5	0.4
Gilbert Group islands	**71,757**	**78,158**	**83,683**	**93,791**	**6,401**	**5,525**	**10,108**	**8.9**	**7.1**	**12.1**	**1.7**	**1.4**	**2.3**
Teeraina	978	1,087	1,155	1,690	109	68	535	11.1	6.3	46.3	2.1	1.2	7.6
Tabuaeran	1,615	1,757	2,539	1,960	142	782	-579	8.8	44.5	-22.8	1.7	7.4	-5.2
Kiritimati	3,225	3,431	5,115	5,586	206	1,684	471	6.4	49.1	9.2	1.2	8.0	1.8
Kanton	83	61	41	31	-22	-20	-10	-26.5	-32.8	-24.4	-6.2	-7.9	-5.6
Line & Phoenix Group islands	**5,901**	**6,336**	**8,850**	**9,267**	**435**	**2,514**	**417**	**7.4**	**39.7**	**4.7**	**1.4**	**6.7**	**0.9**
Rural	49,308	47,777	52,222	52,876	-1,531	4,445	654	-3.1	9.3	1.3	-0.6	1.8	0.2
Urban	28,350	36,717	40,311	50,182	8,367	3,594	9,871	29.5	9.8	24.5	5.2	1.9	4.4
TOTAL	**77,658**	**84,494**	**92,533**	**103,058**	**6,836**	**8,039**	**10,525**	**8.8**	**9.5**	**11.4**	**1.7**	**1.8**	**2.2**

Kiribati's population grew at an average annual rate of 2.2% between 2005 and 2010, picking up pace from more modest annual growth rates of 1.7% between 1995 and 2000, and 1.8% between 2000 and 2005. This gradual change, however, does not occur across all islands. To the contrary, there are quite substantive intercensal contrasts as illustrated by Kiritimati and Tabuaeran, whose populations increased at modest annual rates of 1.2% and 1.7%, respectively, between 1995 and 2000, jumping to 8.0% and 7.4%, respectively, between 2000 and 2005, before reverting to a more modest 1.8% annual growth in the case of Kiritimati, and a -5.2% annual decline in the case of Tabuaeran.

2.5   Population doubling time

An effective way of illustrating the true meaning of population growth is to represent an annual growth rate in terms of the doubling time of a population. In other words, rather than saying that South Tarawa's population increased at a rate of 4.4% each year between 2005 and 2010, a more effective way of communicating the magnitude of this growth is to say, 'Should South Tarawa continue to grow at this rate, its population would double, reaching 100,000 people by the year 2016, or 12 years from now.' And at a rate of 2.2%, Kiribati's population would reach just over 200,000 people in 32 years (i.e. by 2032).

2.6   Population density

High population growth goes hand in hand with growing population density, a demographic concept that describes the number of people living within a specific land area. In this instance, population density is expressed as the number of people per one square kilometer (km²).

Table 2.3: Population density by island and island group, Kiribati 2010

Island/region	Land area (km²)	Population density (per km²)			
		1995	2000	2005	2010
Banaba	6.29	54	44	48	47
Makin	7.89	232	214	302	228
Butaritari	13.49	290	257	243	322
Marakei	14.13	193	180	194	203
Abaiang	17.48	344	331	315	315
North Tarawa	15.26	262	293	372	400
South Tarawa	**15.76**	**1,799**	**2,330**	**2,558**	**3,184**
Maiana	16.72	131	122	114	121
Abemama	27.37	126	115	124	117
Kuria	15.48	63	62	70	63
Aranuka	11.61	87	83	100	91
Nonouti	19.85	153	160	160	135
North Tabiteuea	25.78	131	131	140	143
South Tabiteuea	11.85	118	103	110	109
Beru	17.65	158	155	123	119
Nikunau	19.08	105	91	100	100
Onotoa	15.62	123	107	105	97
Tamana	4.73	250	203	185	201
Arorae	9.48	132	129	132	135
Gilbert group total	**285.52**	**251**	**274**	**293**	**328**
Teeraina	9.55	102	114	121	177
Tabuaeran	33.73	48	52	75	58
Kiritimati	388.39	8	9	13	14
Kanton	9.15	9	7	4	3
Line and Phoenix group total	**440.82**	**13**	**14**	**20**	**21**
Kiribati total	**726.34**	**107**	**116**	**127**	**142**

The average population density for Kiribati in 2010 was 142 people/km^2, reflecting a gradual increase from 107 people/km^2 in 1995 to 127 people/km^2 in 2005 (Table 2.3). The population density in the Gilbert group varied from a low of 41 people/km^2 in Banaba to 400 people/km^2 in North Tarawa. In the Line and Phoenix group, the density varied from 3–177 people/km^2. Kiritimati, which has the biggest land area in all of Kiribati, had a density of only 14 people/km^2. South Tarawa had the highest population density of just over 3,000 people/km^2, illustrating the magnitude of recent urbanisation, with a population density increasing from 1,799 people/km^2 in 1995, to 2,330 people/km^2 in 2000, to 2,558 people/km^2 in 2005, and to 3,184 people/km^2 in 2010. This rate is clearly in excess of other islands with high population densities, such as North Tarawa, Abaiang and Butaritari with more than 300 people/km^2.

2.7   Urbanisation (South Tarawa and Kiritimati Island)

Urbanisation refers to the increase in the proportion of a country's population living in urban areas, which reflects the process by which people move to towns, cities or other densely populated areas. Usually driven by sustained periods of rural-to-urban migration, the process of urbanisation accelerates when combined with high levels of fertility, as discussed in Chapter 4. Urbanisation and urban growth are events of increasing importance to planners and policy-makers because trends and patterns of urbanisation have wide-ranging implications on socioeconomic development as well as on the provision of services in urban and rural areas.

During the past several decades, both the scale and pattern of urban growth in Kiribati have continued to increase rapidly. Like many other countries, the growth of Kiribati's urban population was more rapid than the growth of its rural population. This situation can be attributed to two factors: 1) the availability of more employment and education and/or training opportunities in the capital, which drew migrants from the outer islands to South Tarawa; and 2) the population resettlement scheme introduced by the Kiribati government in 1978, which encouraged individuals and families to move north to Kiritimati Island.

The definition of 'urban area' used in Kiribati population censuses refers to the main island of South Tarawa, where the government capital is located and where many people are involved in activities that are non-traditional or purely for subsistence but also for sales for cash income. However, for the purpose of analysing the level of urbanisation in Kiribati, both Kiritimati Island and South Tarawa are included as urban areas in order to present a better picture of the urbanisation pattern.

2.7.1   Overall trends and levels of urbanisation

Urban and rural population growth in Kiribati since 1947 (illustrated in Table 2.4 and Fig. 2.3), reflect a gradual trend of increased urbanisation. Kiribati is at an accelerated stage of the urbanisation process, with over 50% of its population now living in urban areas. Out of a total population of 103,058, 55,768 people live in the two defined urban areas of South Tarawa and Kiritimati Island, compared with 47,290 people who live in rural areas.

Table 2.4: Trends in urban and rural population growth in Kiribati since 1947

Year	Kiribati Pop	Kiribati Urban	Kiribati Rural	S.Tarawa	Christmas Is.
1947	31,513	1,671	29,842	1,671	-
1963	43,336	6,101	37,235	6,101	-
1968	47,735	10,616	37,119	10,616	-
1973	51,926	14,861	37,065	14,861	-
1978	56,213	19,186	37,027	17,921	1,265
1985	63,883	23,130	40,753	21,393	1,737
1990	72,335	27,917	44,418	25,380	2,537
1995	77,658	31,575	46,083	28,350	3,225
2000	84,494	40,148	44,346	36,717	3,431
2005	92,533	45,426	47,107	40,311	5,115
2010	103,058	55,768	47,290	50,182	5,586

Figure 2.3: Trends in urban and rural population growth in Kiribati since 1947
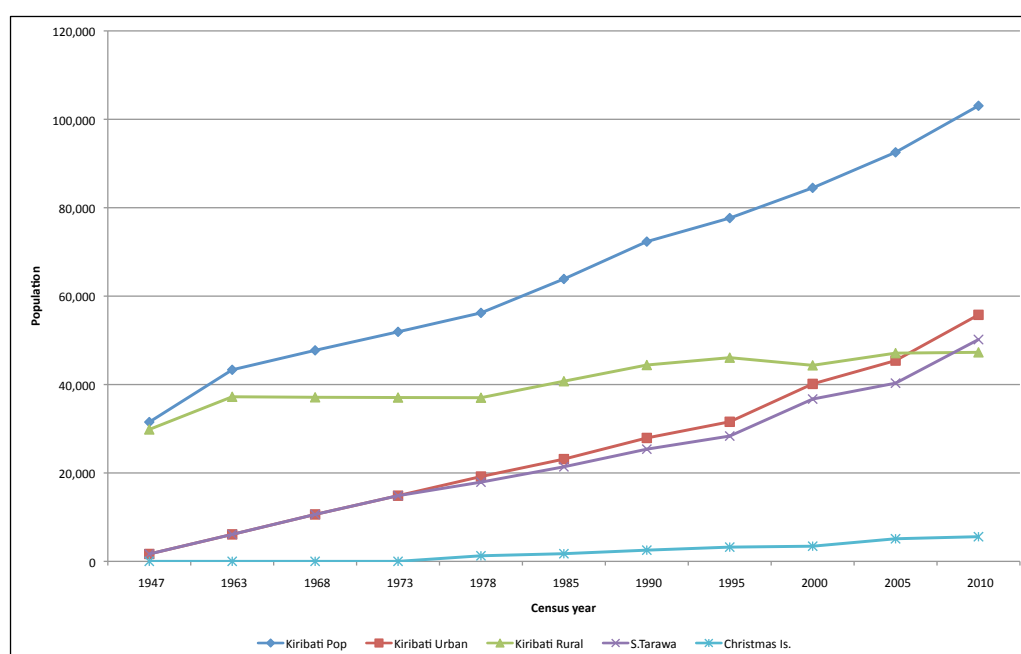
2.7.2   Level of urbanisation

There are two commonly used measures of urbanisation: 1) the degree of urbanisation, which is defined as the proportion of the total population of a country or region that resides in some type of defined urban area; and 2) the tempo of urbanisation, which accounts for the change in the degree (or level) of urbanisation by analysing changes in the indices (or measures) used for measuring the degree of urbanisation. These measures are discussed briefly in the following sections.

Percent urban

The simplest index to measure the urbanisation process refers to the proportion of the total population living in defined urban areas. It is calculated by dividing the total urban population by the total population of a country and multiplying by 100.

While the index is straightforward and easy to understand, it is questionable if it reflects the true relative levels of urbanisation when comparing such figures between countries or over time. For example, in 2000, 47.5% of Kiribati's population lived in urban areas, compared with only 21% of Fiji's population although an analysis of the urban characteristics of the two countries shows that, in most aspects of the urbanisation process, Fiji is 'more urban' than Kiribati. A second disadvantage of this index as a measure of urbanisation is that once a high proportion of the population of a country or an island lives in defined urban areas, further increases in the percent urban are negligible, although the 'urbanisation process' may continue as the size of cities or towns increases.

Urban–rural ratio

This problem is overcome when looking at the urban–rural population ratio, which refers to the number of urban residents relative to the number of rural residents. The urban–rural population ratio is calculated by dividing the proportion of the population that is urban by the proportion that is rural, and multiplying it by 100; this is expressed as the number of urban residents for every 100 rural residents (Table 2.5). In 1947, 5.3% of the population lived in urban areas, while the urban–rural ratio was 5.6, meaning that there were between 5 and 6 people living in South Tarawa for every 100 people living in rural areas. In contrast, by 2010, 54.1% of the population lived in urban areas, and the urban–rural ratio had increased to 117.9, meaning for every 100 people in rural areas, 118 lived in urban areas.

Table 2.5: Urban–rural population distribution (%), Kiribati 1947–2010

Census year	Percent urban	Percent rural	Urban-rural ratio
1947	5.3	94.7	5.6
1963	14.1	85.9	16.4
1968	22.2	77.8	28.6
1973	28.6	71.4	40.1
1978	34.1	65.9	51.8
1985	36.2	63.8	56.8
1990	38.6	61.4	62.9
1995	40.7	59.3	68.5
2000	47.5	52.5	90.5
2005	49.1	50.9	96.4
2010	54.1	45.9	117.9

Figure 2.4 illustrates these developments, showing the proportions of urban and rural populations moving in opposite directions over time, with the urban–rural ratio gradually expanding.

Figure 2.4: Level of urbanisation in Kiribati since 1947
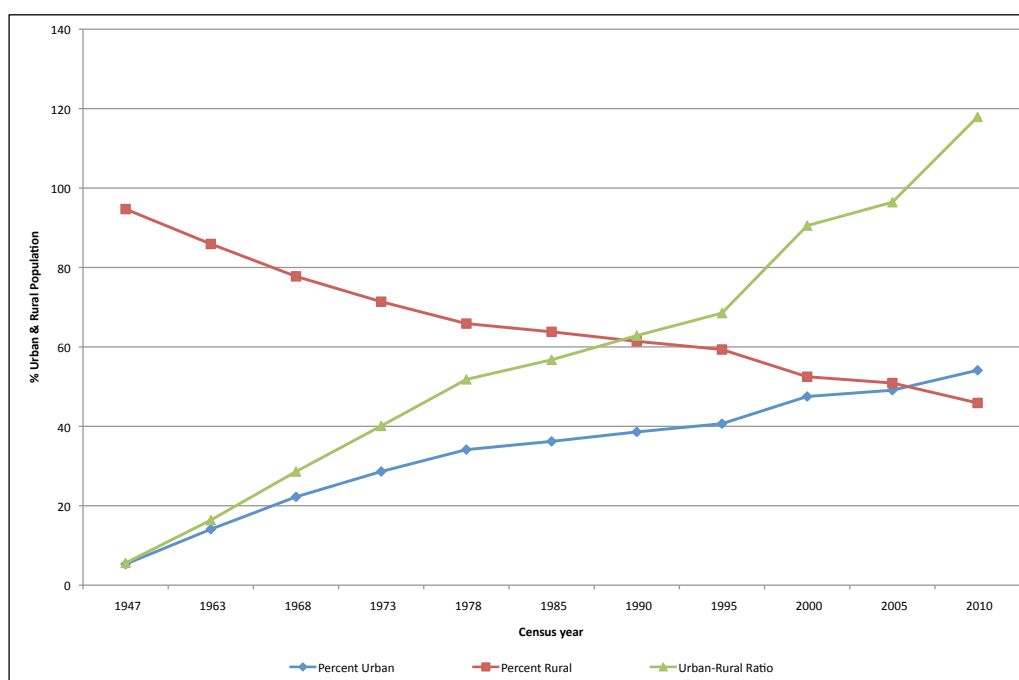
2.7.3 Tempo of urbanisation

With the magnitude of urbanisation readily described by changes in the relative proportions of urban versus rural populations (as illustrated in Table 2.5), policy-makers and planners need to understand more about the underlying process, particularly the speed of this development, in order to make accurate policy and planning decisions for the future.

There are two ways of viewing the speed of recent developments. The first, and perhaps most obvious, is to compare different urban versus rural annual population growth rates over time (see Table 2.6, which illustrates different phases in the Kiribati urbanisation process).

- Following World War II there was a very small population base in South Tarawa. Urban growth between 1947 and 1979 ranged between 5.1% and 11.1% annually; the first 20 years in particular reflected massive social change in terms of rapid urbanisation.
- Annual urban growth slowed from 1978 to 1995, averaging between 2.5% and 3.8%. Many Ellise Islanders lived in South Tarawa during the British colonial administration, and the population decline between 1978 and 1985 most likely reflects a return by Ellise Islanders to Tuvalu. (The Ellise Islands gained their independence in 1978, becoming Tuvalu, while the Gilbert Islands became part of the independent country of Kiribati in 1979).
- Two other factors resulted in slower population growth in South Tarawa after 1978: 1) the relocation scheme to resettle people in Kiritimati, to counteract South Tarawa's rapid population growth; and 2) the labor migration of I-Kiribati to Nauru, to work in the phosphate mines.
- The last 15 years show renewed growth, with South Tarawa and Kiritimati alternately achieving high annual growth rates amidst negative (1995–2000), modest (2000–2005) and only marginal (2005–2010) rural population growth.

- Over the past five years, urban growth averaged 4.1% annually. If Kiribati's urban population continues to grow at this rate, it would double to 111,500 by 2017 — a figure greater than Kiribati's total population today!

Table 2.6: Population growth rates in Kiribati since 1947

Census years	Annual Population Growth Rate (r) of:				
	Kiribati	**Urban***	**Rural**	**South Tarawa**	**Kiritimati**
1947–1963	**2.0**	8.1	1.4	8.1	-
1963–1968	**1.9**	11.1	-0.1	11.1	-
1968–1973	**1.7**	6.7	0.0	6.7	-
1973–1978	**1.6**	5.1	0.0	3.7	-
1978–1985	**1.8**	2.7	1.4	2.5	4.5
1985–1990	**2.5**	3.8	1.7	3.4	7.6
1990–1995	**1.4**	2.5	0.7	2.2	4.8
1995–2000	**1.7**	4.8	-0.8	5.2	1.2
2000–2005	**1.8**	2.5	1.2	1.9	8.0
2005–2010	**2.2**	4.1	0.1	4.4	1.8

Note: * South Tarawa and Kiritimati combined since 1978. Urban population before 1978 is for South Tarawa only.

A second way of gauging the pace of urbanisation is to examine how quickly the urban–rural ratio (Table 2.7) changes, by calculating the annual growth rate in the urban–rural ratio. This supports the earlier description of three different urbanisation phases.

Table 2.7: Change in urban–rural ratios since 1947

Census year	Urban-rural ratio	Annual growth urban-rural ratio
1947	5.6	
1963	16.4	6.7
1968	28.6	11.1
1973	40.1	6.8
1978	51.8	5.1
1985	56.8	1.3
1990	62.9	2
1995	68.5	1.7
2000	90.5	5.6
2005	96.4	1.3
2010	117.9	4

Chapter 3: Population structure and composition

3.1   Introduction

Age and sex are the most important characteristics of a population. Data for males and females and for ages are important for evaluating the completeness and accuracy of the census enumeration. In addition, accurate data on age and sex are importance as they influence birth and death rate, internal and international migration, marital status composition, planning regarding education, medical services, housing and others.

This chapter analyses and presents Kiribati's population structure by age and sex based on the results of the 2010 population census. Analysis and evaluation of the accuracy of age data is first presented, and is followed by descriptions of the changes in the age–sex structure, and a comparison of age–sex pyramids. Other population indices based on age and sex distribution are also presented.

3.2   Examination of the quality of age data

Age data collected in any data collection exercise — such as a census or survey — are often subject to errors in age misreporting in the form of either age heaping (digit preference) or age shifting. Age heaping occurs when people round their age up or down, typically to a number ending with a 0 or a 5. Age shifting occurs when people either understate or overstate their ages for various reasons. Several measures have been developed to determine the extent of errors in age data reporting, such as the Myer's index and others. Also, a population pyramid based on single-age data can detect any irregularities in age distribution.

Figure 3.1 shows heaping at ages ending with 0, 1 and 5 and avoidance of ages ending with 7, 8 and 9.

Figure 3.1: Population pyramid by single year of age and sex, 2010
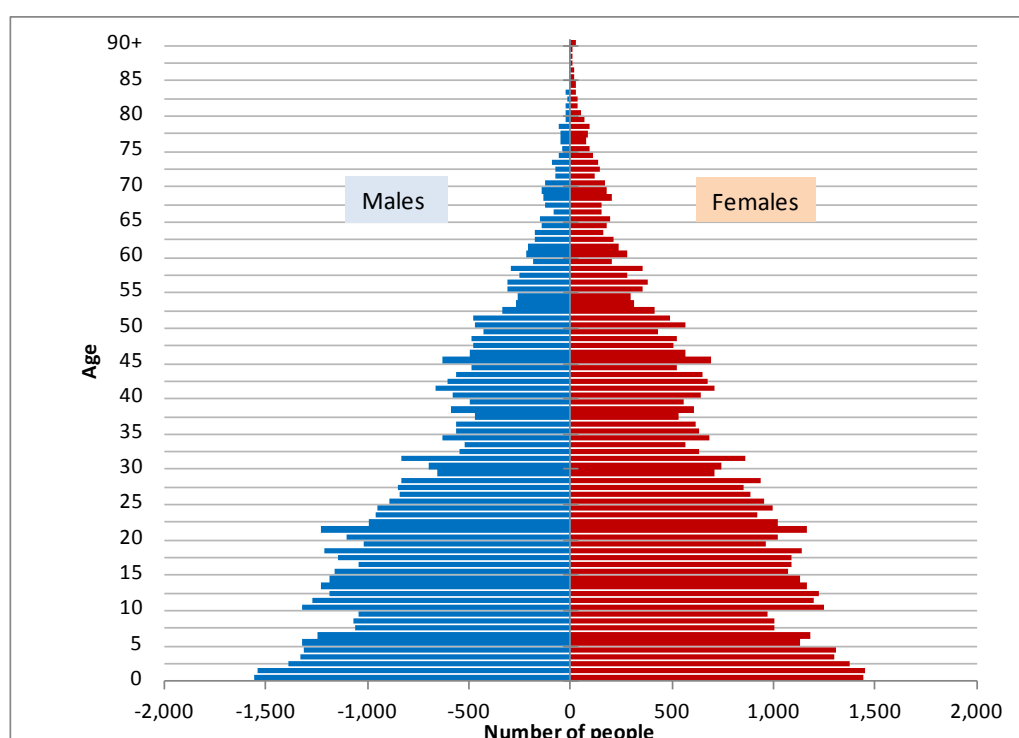
Other indices of age misreporting are presented in Table 3.1. One of the most useful indices included in Table 3.1 is the Myer's index, which evaluates age data with respect to digit preference. The index returns a negative value if a digit is avoided and a positive value if it is preferred. This index's range is from 0 to 180. The Whipple's index is also applied here to evaluate age preference of digits 0 and 5, and varies from 100, representing no concentration or preference at all, to 500, if no returns were recorded with any digits other than those mentioned.

Table 3.1: Indices of accuracy of age reporting for Kiribati censuses in 2000, 2005 and 2010

Censuses	Myer's Index		Whipple's Index	
	Males	Females	Males	Females
2000	9.9	8.9	109.6	119.3
2005	6.5	6.1	104.0	107.7
2010	5.6	5.3	102.4	105.2

The results of age misreporting shown in Table 3.1 indicate considerable improvements in age reporting over the three census periods, as shown with the Myer's index. The Whipple index also indicates that there is no concentration or age heaping with respect to numbers ending with 0 or 5 as the measures shown in 2010 are closer to 100 (102.4 and 105.2 for males and females respectively).

Figure 3.2 shows some age heaping for ages ending in 1 and 8, and less with ages ending in 0, 2 and 5. Females show more preference for ages ending in 1. The remaining digits were avoided, with 9 being the most avoided followed by 3.

Figure 3.2: Myer's index of digit preference, Kiribati 2010
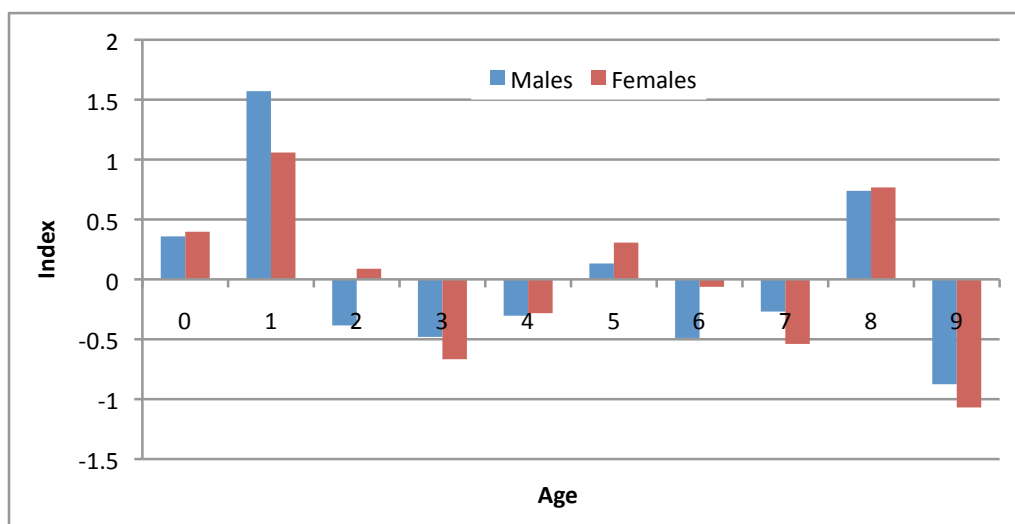
3.3　Changes in the age and sex structure

The growth and changing population structure of Kiribati can also be illustrated by using population pyramids with horizontal bars presenting the number or proportion of males and females for each age group. The overall shape of the pyramid and the size of the bars depict the changes in the age and sex structure of the population as a result of past levels of fertility, mortality and migration in the population. Population pyramids for Kiribati as a whole, and for its urban and rural residents for 2005 and 2010 are presented in Figures 3.3, 3.4 and 3.5.

Figure 3.3: Kiribati population pyramid for 2005 (shaded) and 2010 (outlined)
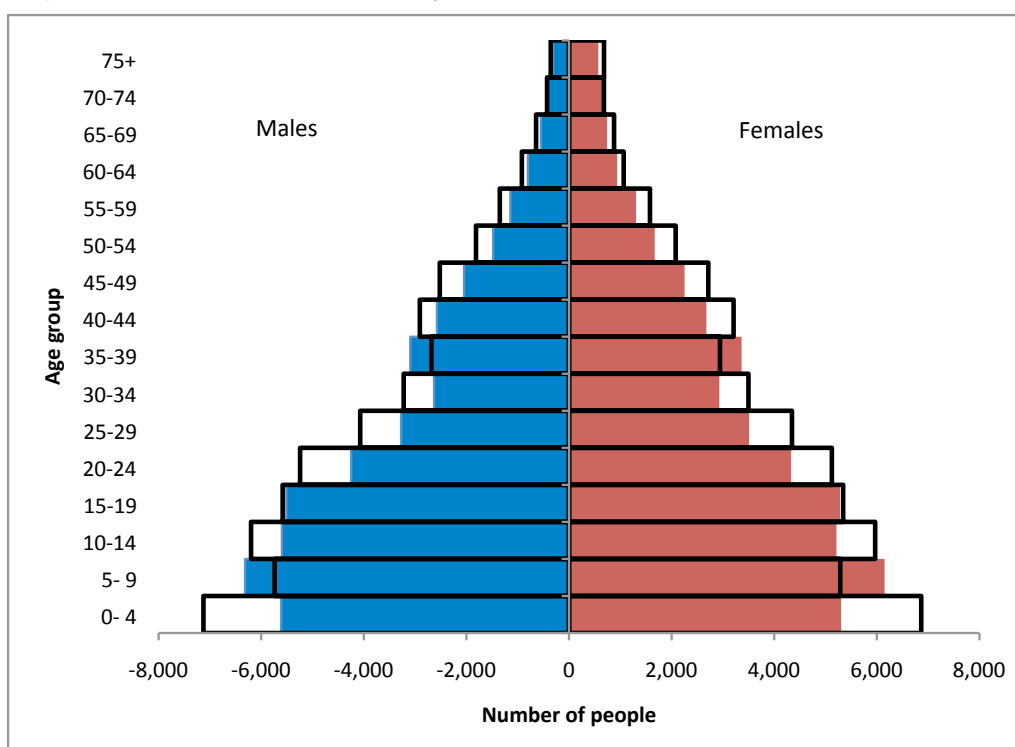
Figure 3.3 presents Kiribati's population pyramid for 2005 (shaded area) and 2010 (outlined). Both pyramids have a similar shape, with large percentages of young people aged less than 15 and fewer people in the older age group of 60 and over. This pyramid shape is typical of a population with rapid growth associated with past high birth rates and incidences of early deaths. This is considered to be an expansive age structure, which guarantees that Kiribati's population will continue to grow even during declines in fertility. This is due to high levels of fertility in the past, which result in rapid population growth.

The pyramid indicates evidence of early death in Kiribati's 2010 population. Adult mortality, particularly in ages 60 and over, results in a narrowing of the pyramid as age increases. This is also supported by the estimated life expectancy discussed in a later chapter.

In comparison, the base of the pyramid in 2005 was much smaller than it was in 2010, indicating that there were fewer births between 2000 and 2005 as compared with births between 2005 and 2010. In 2005, the fertility level was recorded to be declining from 4.5 births in 2000 to 3.5 births in 2005, and this could have contributed to the narrow base of the 2005 census pyramid. The data also showed fewer people in the 35–39 age group, illustrating a decline in fertility around 1970.

Figure 3.4: Population pyramid, South Tarawa 2005 (shaded) and 2010 (outlined)
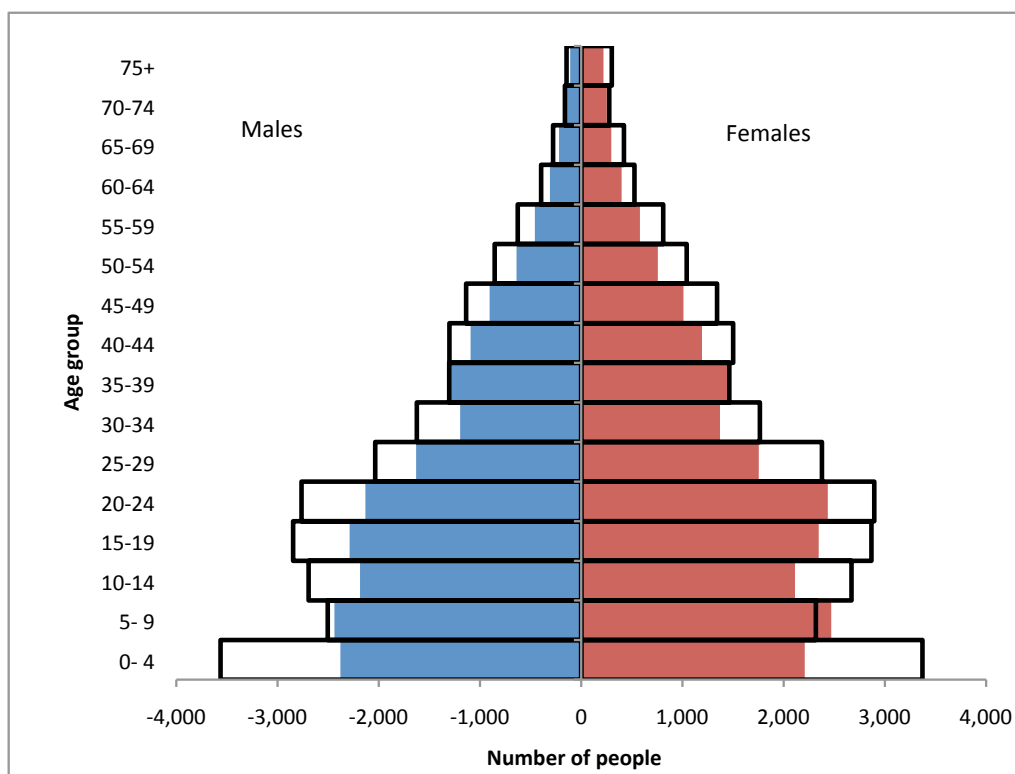
Figure 3.4 shows the population pyramid for the 2005 and 2010 censuses by age group and sex. More births occurred in South Tarawa between 2005 and 2010 compared with births between 2000 and 2005. The bars for males and females for the 10–29 age group are longer in 2010 than they are in 2005, which could be due to age-selective migration from overseas or outer islands.

Figure 3.5: Population pyramid for Kiribati's rural areas (outer islands) in 2005 (shaded) and 2010 (outlined)
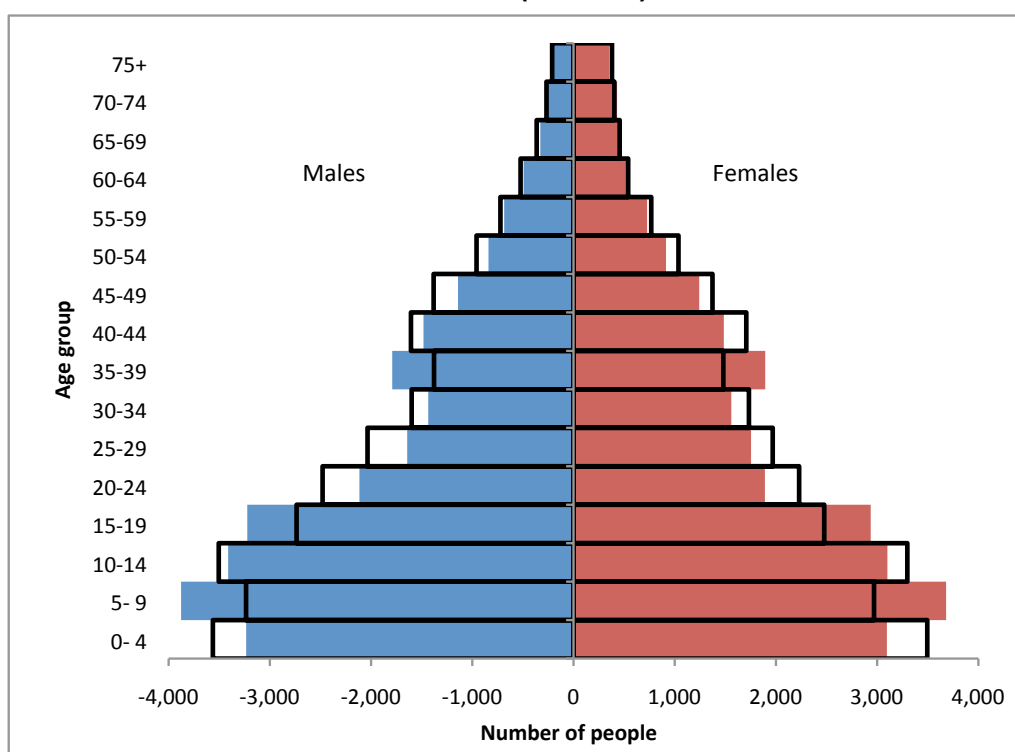
The rural areas (outer islands) pyramid for 2005 and 2010 (Fig. 3.5) reflects the opposite pattern to that of South Tarawa, confirming the likelihood of movement between the outer islands and South Tarawa. While South Tarawa gained more people in the 10–24 age group, rural areas lost people. Consequently, births recorded in rural areas for both censuses did not show significant differences as compared with those recorded for South Tarawa.

Although the pyramids for South Tarawa (urban) and the outer islands (rural) present different features than the pyramid for Kiribati as a whole, they have a common pattern of a wide base that narrows with increasing age, indicating future population growth and early death in the population.

3.4   Kiribati population indicators for 2005 to 2010

Kiribati's population is young, with 36% percent below the age of 15, and only 5% in the 60 and over age group. The population of the working age group (i.e. 15–59) is estimated to be 58% of the national level. These population counts are stable as seen in Table 3.2 below. Figure 3.6 presents the result in graphical form.

Table 3.2: Population indicators of the 2005 and 2010 censuses

Indicators	Kiribati		South Tarawa		Rural areas	
	2005	2010	2005	2010	2005	2010
Age group						
0–14	37	36	34	34	39	38
15–59	58	58	61	61	55	56
60+	5	5	5	5	6	6
Total						
Summary measures						
Dependency ratio	74	71	64	64	82	78
Median age	20.7	21.6	21.9	22.0	19.6	21.2
Sex ratio	97	97	93	93	101	101

Figure 3.6:Proportion of population by age group, Kiribati 2010
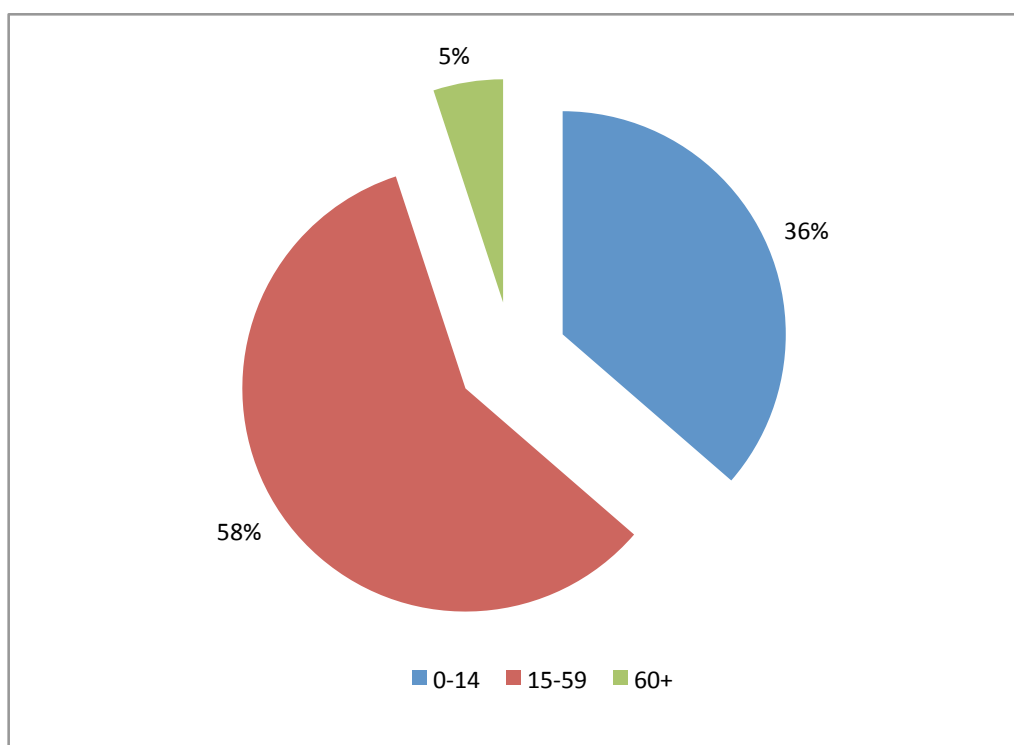
3.4.1 Dependency ratio

The age-dependency ratio is defined here as the population aged less than 15, and the population aged 60 and over (known as the 'dependent population'), divided by the population in the 15–59 age group (economically productive or working population). The age-dependency ratio is often used as an indicator of the economic burden that the productive portion of the population must carry in order to support the 'dependent population'. The age-dependency ratio for 2010 is estimated to be 71, which is a decline from 74 in 2005.This means that there were 71 people in the dependent group for every 100 working-aged people. This ratio is considered to be high due to the large proportion of children in Kiribati. The higher the dependency ratio, the higher the number of people in the dependent group that need to be supported and cared for by the working population. South Tarawa's age-dependency ratio is recorded to be lower than in the rural areas.

3.4.2 Median age

The median age is the age at which exactly half the population is older and the other half is younger. The median age for Kiribati in 2010 was 21.6, meaning that half of the total population for Kiribati is older and the other half is younger than 21.6. The median age of 21.6 indicates that the majority of Kiribati's population is composed of young people. In 2005, the median age was 20.7 (Table 3.2).

3.4.3 Sex ratio

The 2010 census recorded 50,796 males and 52,262 females for a total population of 103,058 people. The sex composition of the population can be measured by the sex ratio, which is defined as the number of males per 100 females. A sex ratio of 100 denotes equal numbers of males and females; a sex ratio of more than 100 means more males than females; and a sex ratio of less than 100 indicates fewer males than females. Data from the 2010 census makes it possible to calculate the sex ratio for Kiribati as a whole, and for each individual island.

Figure 3.7: Sex ratio by island, Kiribati 2010
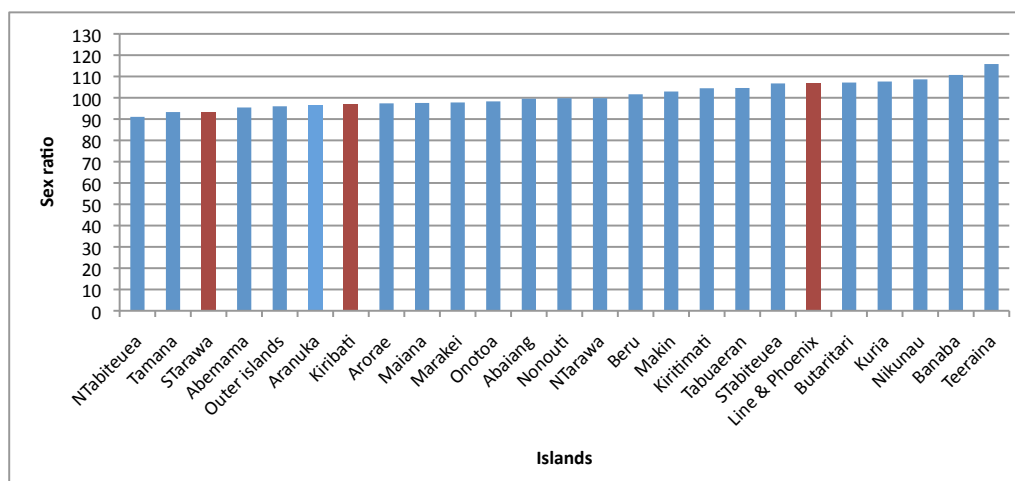
The sex ratio for each island, including Kiribati as a whole, South Tarawa (urban), and rural areas (outer islands), are presented in Figure 3.7. Overall, Kiribati's sex ratio was 97 males per 100 females, reflecting more females than males in the total population. South Tarawa's sex ratio was 93, indicating fewer males than females. In the Line and Phoenix group, the sex ratio was 107 (i.e. more males than females). Of the 23 islands in Kiribati, 10 had a population that constituted of more females than males.

Figure 3.8: Sex ratio by age group, Kiribati 2005 and 2010
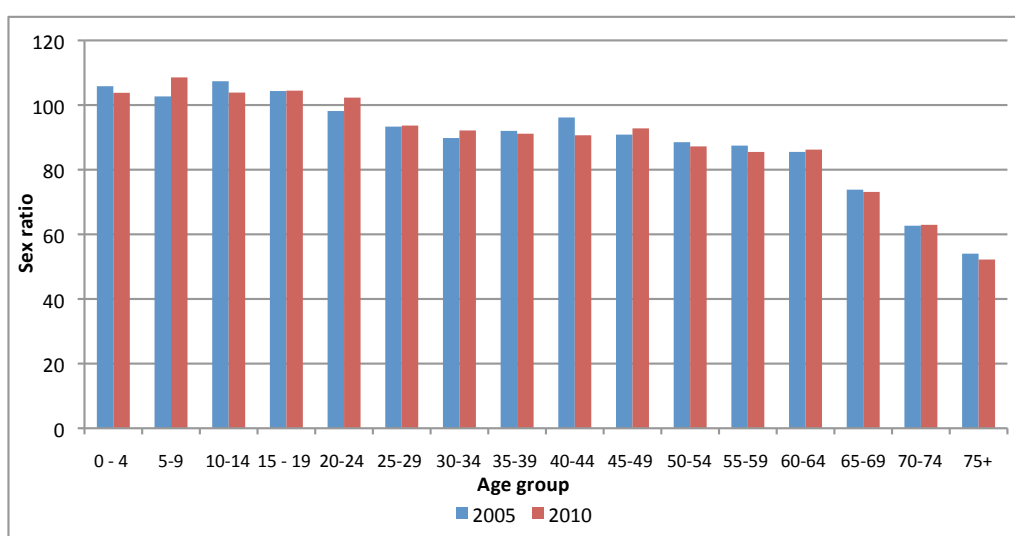
Sex differences in mortality and migration cause the sex ratio to vary between ages as shown in Figure 3.8. Normally, the sex ratio at birth favours males, but on average, women live longer than men and, thus, the sex ratio tends to decline with age. Kiribati is no exception. The sex ratio was higher in the 0–19 age groups in both 2005 and 2010, meaning that there were more males in the population within these age groups. By age 25 and over, the sex ratio starts to decline as age increases, meaning that men were outnumbered by women in the older age groups.

3.5   Population composition

All people residing in Kiribati during the 2010 census were asked about their ethnicity. Out of the total population of 103,058 people, about 90% were I-Kiribati, 10% were I-Kiribati and other ethnicities, and about 1% identified themselves as non-I-Kiribati (e.g. from Australia, New Zealand, Fiji). Table 3.3 and Figure 3.9 present the results in figures and graphic form.

Table 3.3: Population by ethnic origin and by sex, Kiribati 2010

Ethnicity	Males	Females	Total	Percent
I-Kiribati	45,300	46,906	**92,206**	89
I-Kiribati and others	4,977	4,983	**9,960**	10
Non-Ikiribati	519	373	**892**	1
Total	**50,796**	**52,262**	**103,058**	**100**

Figure 3.9: Population by ethnic origin, Kiribati 2010
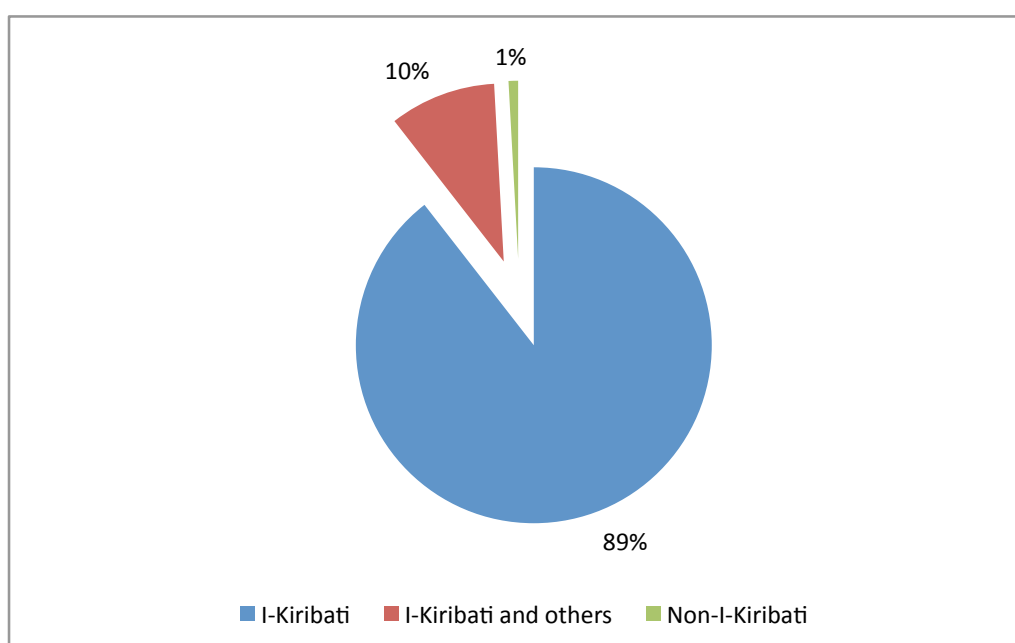
Chapter 4: Fertility

4.1   Introduction

Fertility refers to the reproductive behaviour of a population, and is related to the number of live births a woman has had. Fertility significantly impacts a country's age–sex composition, because birth rates largely determine the composition and size of different age groups, unless there are high levels of migration.

The main source of fertility data is derived from the Kiribati 2010 census. Fertility estimates and measures presented here are calculated from information collected on children ever born and births in the 12 months prior to the census by women 15 and over. All women in this age range residing in Kiribati during the 2010 census were asked two fertility-related questions.

Although fertility-related questions tried to capture all births, data obtained are often subject to different types of errors such as omissions or recall errors related to some births within the specified period, or overstating the number of births. Several methods such as the P/F ratio and Arriaga method, have been developed and widely used to adjust for reporting errors and, thus, present more accurate levels of fertility.

4.2   Fertility estimates

This chapter presents the following fertility indicators:
- *Age Specific* Fertility *Rates* (ASFR) is the number of births to women of a particular age group during a specific time period;
- *Total Fertility Rates* (TFR) is the average number of children that would be born to a woman by the time she ended her childbearing if she were to pass through all her childbearing years conforming to the Age-Specific Fertility Rates of a given year;
- *Crude Birth Rates* (CBR) is the number of live births per 1,000 population in a given year;
- *Teenage Fertility Rates* relates to child-bearing among young women aged 15–19, and is synonymous with the ASFR (15–19);
- *Mean Age at C*hildbearing (MAC) refers to the mean age of mothers at the birth of their children if women were subject throughout their lives to the ASFR observed in a given year.

4.2.1   Children Ever Born alive
The Kiribati 2010 census asked all women aged 15 and over two fertility-related questions:
- How many live born children of each sex have been born to this woman?
- What is the date of birth of this woman's last child born alive? (including a child that may have died since)?

There were 88,322 children ever born alive from 34,141 women aged 15 years and over in 2010, which equals an average of 2.6 children ever born alive per woman. The average number of children ever born alive (or, average parity) varies throughout each age cohorts illustrating differential fertility level at each age group (Table 4.1). Younger women had fewer children born alive (0.09) than older women because they just entered the child bearing age. On the other hand, women aged 30–34 had 2.63 children on average, and by the end of their childbearing ages, women had given birth to 4.3 children.

Table 4.1: Females aged 15 and over by number of children ever born alive, Kiribati 2010

Age of women	Number of women	Number of children ever born			Average of children ever born		
		Males	Females	Total	Males	Females	Total
15–19	5,344	233	238	471	0.04	0.04	0.09
20–24	5,124	1,773	1,714	3,487	0.35	0.33	0.68
25–29	4,346	3,539	3,387	6,926	0.81	0.78	1.59
30–34	3,498	4,742	4,452	9,194	1.36	1.27	2.63
35–39	2,943	5,076	4,887	9,963	1.72	1.66	3.39
40–44	3,208	6,737	6,206	12,943	2.10	1.93	4.03
45–49	2,715	5,947	5,632	11,579	2.19	2.07	4.26
50–54	2,079	4,963	4,675	9,638	2.39	2.25	4.64
55–59	1,578	3,881	3,550	7,431	2.46	2.25	4.71
60–64	1,066	2,516	2,502	5,018	2.36	2.35	4.71
65–69	878	2,284	2,153	4,437	2.60	2.45	5.05
70–74	680	1,772	1,787	3,559	2.61	2.63	5.23
75+	682	1,861	1,815	3,676	2.73	2.66	5.39
Total	**34,141**	**45,324**	**42,998**	**88,322**	**1.33**	**1.26**	**2.59**

4.2.2 *Births in the 12 months prior to the census*

The total number of live births reported in the 12 months prior to the census was 2,964. These were the last live born child born between 7 November 2009 and 6 November 2010. ASFR was derived by dividing the total number of live births by women in each age group in the 12 months prior to the census by the total number of corresponding women in the same age group. While this would be the best source of fertility information, it is not the best practice to use due to a tendency for women to underreport these births, which leads to an underestimation of fertility levels or vice versa. Past experience showed evidence that older women tend to misreport the total number of children ever born alive, especially forgetting or not wanting reporting their infants died very young or older children who have died. Therefore, indirect methods were commonly applied on these data for deriving and checking the quality of the level of fertility.

Table 4.2: Number of births in the 12 months prior to the 2010 census by age of mother and the Age-Specific Fertility Rate (ASFR), Kiribati, 2010

Age of women	Number of women	Number of births	ASFR
15-19	5,344	202	0.0378
20-24	5,124	827	0.1614
25-29	4,346	837	0.1926
30-34	3,498	595	0.1701
35-39	2,943	346	0.1176
40-44	3,208	139	0.0433
45-49	2,715	18	0.0066
Total	**27,178**	**2,964**	**0.7294**
Total Fertility Rate			**3.6471**

Fertility analysis is based on 2005 and 2010 census data, using the Arriaga method, which measures fertility based on two data points. The software PAS (developed by the US Census Bureau), procedure ARFE-2, and the United Nations procedure MORTPAK 4.1 (FERTPF) were used (see Appendices 4.1 and 4.2).

4.2.3 Total Fertility Rates (TFR)

As stated earlier, TFR refers to the average number of children that would be born to a woman by the time she completed childbearing, assuming she passed her childbearing ages conforming to the ASFR of a given period. TFR for Kiribati is estimated to be 3.9 children per woman, which is an increase of half a child from 2005 (Table 4.3). This means that, on average, each Kiribati woman has about or just under four children. This figure corresponds closely to that of the 2009 Kiribati Demographic Health Survey, which recorded a TFR of 3.8.

Table 4.3 presents the ASFR and TFR for Kiribati as a whole, and for its urban and rural areas. South Tarawa had the highest number of births in Kiribati with 4.1 children per woman. The TFR for rural areas are lower than the overall fertility level and the urban, having recorded as 3.7 children per woman as shown in column 7.

Table 4.3: Estimated Age-Specific Fertility Rate (ASFR), Total Fertility Rate (TFR), Crude Birth Rate (CBR), teenage fertility rate, and Median Age at Childbearing (MAC), Kiribati 2010

Age of women	Number of women	ASFR			Kiribati estimated number of births (2 x 3)
		Kiribati	Urban	Rural	
(1)	(2)	(3)	(4)	(5)	(6)
15–20	5,344	0.0499	0.0487	0.0514	267
20–25	5,124	0.1821	0.1881	0.1766	933
25–30	4,346	0.2058	0.2186	0.1926	894
30–35	3,498	0.1769	0.1908	0.1635	619
35–40	2,943	0.1179	0.1272	0.1092	347
40–45	3,208	0.0401	0.0424	0.0380	129
45–50	2,715	0.0051	0.0060	0.0043	14
Total	27,178				3,203
TFR		3.9	4.1	3.7	children per woman
MAC		29.2	29.4	29.1	years
CBR		31.1	35.8	26.8	births/1000 population

4.2.4 Age-Specific Fertility Rate

ASFR refers to the number of births to women aged 15–49 by each specific age group. Table 4.3 and Figure 4.1 illustrate the estimated ASFR for women in the childbearing ages of 15–49 in Kiribati during the 2010 census, and demonstrate Kiribati's high fertility level. Childbearing commenced early, at 15–19 years, with an average of 0.05 children per woman in this age group. Consequently, childbearing increases and peaks in the 25–29 age group, slightly declining in the 30–34 age group, and dropping sharply in the 40–49 age group, implying that childbearing had ceased. By region, South Tarawa had the highest ASFR at ages 20–39. Looking at ASFR for each age group, the most obvious reproductive group of women are in the 25–30 age category, with the urban area having the highest fertility level.

Figure 4.1: Estimated Age-Specific Fertility Rate (ASFR) of women aged 15–49, Kiribati 2010
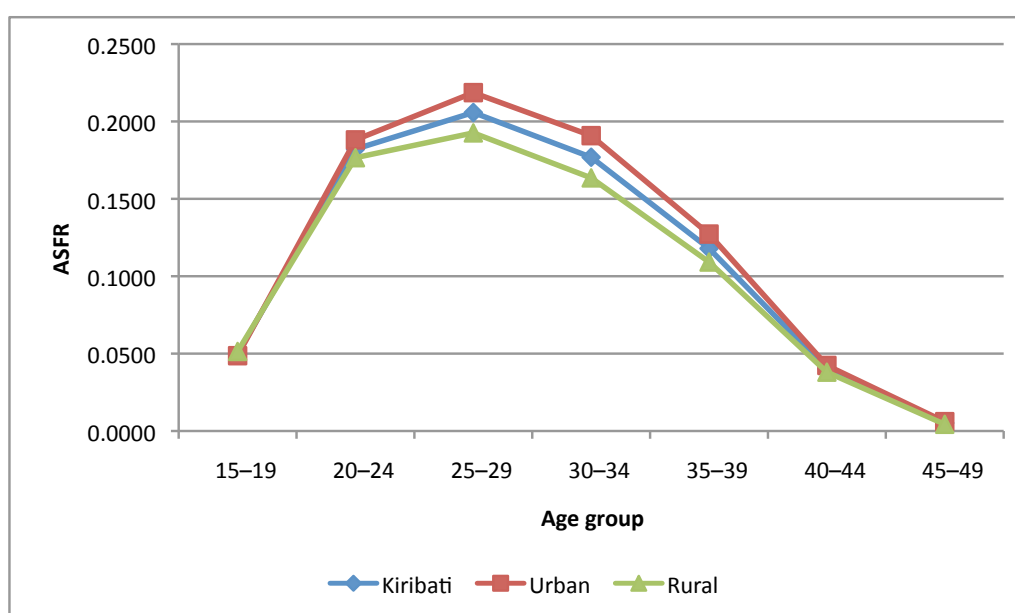
4.2.5   Crude Birth Rate

CBR provides a crude measure of the total number of live births per 1,000 population in a given year. This measure is called 'crude' because it includes the entire population, including those who are not at risk of giving birth (e.g. males and very young females). In 2010, CBR for Kiribati as a whole was 31.1 births per 1,000 population, for South Tarawa (urban area) CBR was 35.8 births per 1,000 population, and for rural areas CBR was 26.8 births per 1,000 population.

4.2.6   Mean Age at Childbearing

MAC is the mean age of mothers at the time of birth of their children if women were subject throughout their lives to the ASFR observed in a given year. It is calculated by adding ASFRs weighted by the mid-point of each age group, and dividing by the sum of ASFRs. In Kiribati, MAC is estimated to be 29.2 years.

4.2.7   Teenage fertility rates

Teenage pregnancy is a major challenge in Kiribati, due to concerns over the young age of the mother, the impact on her health and the health of her child, the adverse impact that an early pregnancy may have on girls and young women's education and employment, and the fact that is a result of unprotected sex that exposes mother and child to the risk of HIV/AIDs and other sexually transmitted infections. Teenage fertility rates correspond to ASFR of women in the 15–19 age group.

The teenage fertility rate is shown in Table 4.3 for Kiribati as a whole, and for its urban and rural areas. The overall fertility rate for young mothers was estimated to be 50 births per 1,000 women in the 15–19 age group, showing only marginal differences between urban (49 births per 1,000 women) and rural (51 births per 1,000 women) areas.

4.3   Fertility trends and patterns

ASFR in the 2010 census was compared with the previous two censuses of 2000 and 2005, and is shown in Figure 4.2 below. Overall, the pattern of fertility rates in all three censuses demonstrate a similar trend, with peak rates occurring in women aged 25–29, indicating that this age cohort are the most fertile. Fertility rates begin declining at ages 30–34, and drop dramatically with increasing age. This either indicates that these older women have more control over the number of children they have, or that they have completed their childbearing.

Despite these broad similarities, two noteworthy developments emerge:
* overall lower ASFRs of women across all age groups in 2005; and
* a noticeable decline in fertility among women aged 40–49 since 2000, pointing to women ending their childbearing at earlier ages.

Figure 4.2: Age-Specific Fertility Rates for women aged 15–49 in 2000, 2005 and 2010
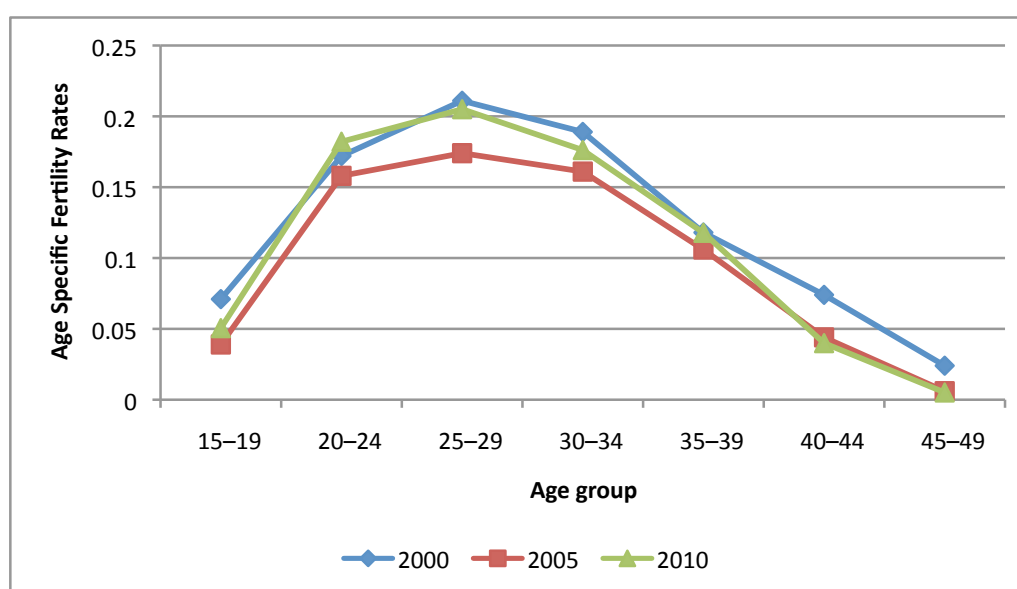
TFR for Kiribati is shown in Figure 4.3 and illustrates a slightly declining trend over the past 20 years, highlighting an uncharacteristic dip between 2000 and 2005. This may be due to several reasons, including the possibility that some data integrity issues surround the 2005 census, or that there was a period of more intensive family planning activities and uptake during these years. While Kiribati's TFR declined by around 1 live birth during the past 20 years, with women currently averaging four children, this rate is still twice that of replacement fertility, and ranks among the highest in the Pacific Islands region. At this rate, Kiribati will continue to experience high population growth into the near future.

Figure 4.3: Trends in Kiribati's Total Fertility Rate for 1990, 1995, 2000, 2005 and 2010
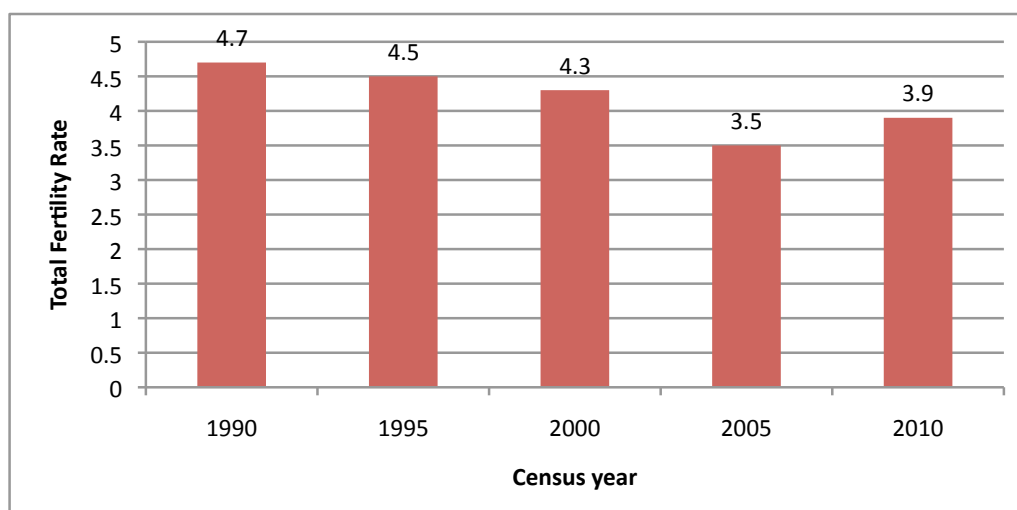
Chapter 5: Mortality

5.1   Introduction

The mortality of a population depends of various factors, including:
- its demographic composition (age–sex structure);
- access to health and medical services;
- environmental conditions and availability of infrastructure such as housing, water supply, sanitation, waste disposal;
- exposure to risk factors and substance abuse;
- work-related dangers;
- exposure to events outside individual control (e.g. natural disasters, war); and
- socioeconomic status and level of overall well-being.

Incidence of death reveals much about a population's standard of living and its general state of health, with indicators such as infant mortality and life expectancy at birth widely used to describe the overall development status of a country.

As with fertility and migration, mortality statistics are important ingredients of reliable population projections and estimates, which are essential to sound policy development and planning purposes. The Kiribati government endorsed the 2000 Millennium Development Goals, and requires accurate and up-to-date mortality information in order to report on progress against key development goals regarding child and maternal health.

5.2   Data quality and availability

The following information gained from the Kiribati 2010 census enabled the estimation and analysis of mortality level through an indirect method of calculation.
- Number of household members that died in the last three years.
- Children ever born alive classified by five-year age group of mother.
- Children surviving (or dead) classified by five-year age group of mother.
- Whether a respondents father and/or mother was still alive (orphanhood).
- Whether a respondent's marital status was 'widowed' (widowhood).

The accuracy and reliability of mortality level estimates depend heavily on female respondents giving complete answers to questions on the number of live births and total number of children who have died, as well as providing accurate recall of deaths of former household members. Misreporting distorts the accuracy of mortality estimates, which poses a particular problem in small populations, notwithstanding the use of indirect estimation methods used to analyse mortality based on census and survey data, which allows for some adjustment to reporting errors.

5.3   Mortality measures

Several measures are used to measure mortality, among these are the crude deaths rate (CDR), infant mortality rate (IMR), and estimated life expectancy. Information on deaths in the 12 months prior to the census provides a framework for a direct calculation of recent mortality levels in the country (Table 5.1). According to the data shown in Table 5.1, there were 633 deaths in the 12 months prior to the census (385 males, 248 females). Such data are associated with a high level of underreporting — in particular, poor reporting of older women's children died at very young   and the data are therefore not typically used when determining mortality level. Applying these raw data to calculate a life table using United Nations software PAS (procedure LTPOPDTH), the resulting estimated life expectancies at birth would amount to 62.8 for males and 74.8 for females, which are considered to be too high for Kiribati.

Table 5.1: Household members who died 12 months prior the 2010 census

Age	Sex		
	Total	**Males**	**Females**
0	**90**	43	47
1–4	**42**	30	12
5–9	**12**	6	6
10–14	**5**	4	1
15–19	**29**	20	9
20–24	**25**	15	10
25–29	**22**	15	7
30–34	**22**	18	4
35–39	**29**	18	11
40–44	**31**	21	10
45–49	**45**	31	14
50–54	**40**	25	15
55–59	**69**	42	27
60–64	**29**	21	8
65–69	**42**	26	16
70+	**101**	50	51
Total	**633**	**385**	**248**

5.3.1   Children ever born alive, survived and died

It is well known that the proportion of children ever born but who have died is an indicator of child mortality. In the 2010 census, 34,141 women aged 15 and over reported having given birth to 88,332 children. These were children who were ever born alive from women since the beginning of their childbearing years until the time of the 2010 census.

About 89% (78,809) of the total ever born were still alive and were staying in either the same household as the mother, or were living somewhere else; 11% (9,513) had died.

The proportion of children who died increased with the mother's age, with 5.7% of children born to mothers in the 15–19 age group dying, and 8.9% of children born to mothers in the 40–44 age group dying. The direct calculation of the sex ratio in the last column of Table 5.3 indicates the probability of male and female children dying. On average the sex ratio was 1.3, meaning that more male children than female children died.

Table 5.2: Females aged 15 and over by the total number of children ever born, survived and died, Kiribati 2010

Age of mother	Total females	Children ever born			Children survived			Children died		
		Males	Females	Total	Males	Females	Total	Males	Females	Total
15–19	5,344	233	238	471	224	220	444	9	18	27
20–24	5,124	1,773	1,714	3,487	1,677	1,642	3,319	96	72	168
24–29	4,346	3,539	3,387	6,926	3,320	3,187	6,507	219	200	419
30–34	3,498	4,742	4,452	9,194	4,389	4,197	8,586	353	255	608
35–39	2,943	5,076	4,887	9,963	4,696	4,584	9,280	380	303	683
40–44	3,208	6,737	6,206	12,943	6,084	5,697	11,781	653	509	1,162
45–49	2,715	5,947	5,632	11,579	5,261	5,142	10,403	686	490	1,176
50–54	2,079	4,963	4,675	9,638	4,294	4,192	8,486	669	483	1,152
55–59	1,578	3,881	3,550	7,431	3,258	3,137	6,395	623	413	1,036
60–64	1,066	2,516	2,502	5,018	2,048	2,197	4,245	468	305	773
65–69	878	2,284	2,153	4,437	1,834	1,829	3,663	450	324	774
70–74	680	1,772	1,787	3,559	1,360	1,509	2,869	412	278	690
75+	682	1,861	1,815	3,676	1,392	1,439	2,831	469	376	845
Total	34,141	45,324	42,998	88,322	39,837	38,972	78,809	5,487	4,026	9,513

Table 5.3: Females aged 15 and over by the proportion of children ever born alive, survived and died, Kiribati 2010

Age of mother	Total females	Proportion of children survived			Proportion of children died			Death Sex ratio
		Males	Females	Total	Males	Females	Total	
15–19	5,344	96.14	92.44	94.27	3.86	7.56	5.73	0.51
20–24	5,124	94.59	95.80	95.18	5.41	4.20	4.82	1.29
24–29	4,346	93.81	94.10	93.95	6.19	5.90	6.05	1.05
30–34	3,498	92.56	94.27	93.39	7.44	5.73	6.61	1.30
35–39	2,943	92.51	93.80	93.14	7.49	6.20	6.86	1.21
40–44	3,208	90.31	91.80	91.02	9.69	8.20	8.98	1.18
45–49	2,715	88.46	91.30	89.84	11.54	8.70	10.16	1.33
50–54	2,079	86.52	89.67	88.05	13.48	10.33	11.95	1.30
55–59	1,578	83.95	88.37	86.06	16.05	11.63	13.94	1.38
60–64	1,066	81.40	87.81	84.60	18.60	12.19	15.40	1.53
65–69	878	80.30	84.95	82.56	19.70	15.05	17.44	1.31
70–74	680	76.75	84.44	80.61	23.25	15.56	19.39	1.49
75+	682	74.80	79.28	77.01	25.20	20.72	22.99	1.22
Total	34,141	87.89	90.64	89.23	12.11	9.36	10.77	1.29

Based on the information collected on children ever born alive and survivorship, the following mortality indicators (Table 5.4) were estimated using indirect methods. The United Nations software package Mortpak 4.1 (procedure CEBCS) was used for deriving Kiribati's mortality estimates (Appendices 5.1 and 5.2).

5.3.2 Infant and childhood mortality

IMR refers to the number of infant deaths before the child reaches 1 year of age, per 1,000 live births. IMR for Kiribati is estimated to be 50 for male infants and 39 for female infants, which is a decrease from 2005 when IMR was 51 for males and 52 for females.

The child mortality rate is the probability of a child dying between the age of 1 and 5 years. The child mortality rate for Kiribati is estimated to be 16 for male children and 11 for female children per 1,000 live births.

The under 5 mortality rate refers to the probability of a child dying between birth and age 5, and is estimated to be 66 for male children and 50 for female children per 1,000 live births. This measure is the sum of IMR and the child mortality rate (4q1).

Table 5.4: Mortality indicators, Kiribati 2010

Mortality Indicators by sex	2005	2010
Infant Mortality Rate (IMR)		
Males	53	50
Females	51	39
Total	**52**	**45**
Child Mortality Rate (4q1)		
Males	18	16
Females	17	11
Total	**17.5**	**14**
Under 5 Mortality rate (q5)		
Males	71	66
Females	68	50
Total	**69**	**59**
Life Expectancy at birth E(0)		
Males	58.9	59.7
Females	63.1	67.5
Total	**61.0**	**63.2**
Crude Death rate (CDR)		
Males	9.2	9.1
Females	8.3	6.6
Total	**8.7**	**7.8**

To calculate male and female life expectancy at birth, MORTPAK 4.1 (procedure MATCH) was used with data input from the above calculated childhood mortality rates. The Far East Asian pattern of the United Nations model life tables was assumed to closely resemble the empirical mortality pattern of Kiribati and so was adopted. The empirical mortality pattern was calculated by using the number of recorded deaths by age and sex between 2005 and 2010 to determine age-specific death rates using 2005 and 2010 census population data (age and sex as a denominator). The procedure BESTFT was also applied to test and find the model life table with the best fit to the empirical mortality data of Kiribati. Both methods confirmed the same result.

According to the assumptions made and the procedures and methods used, life expectancy at birth was estimated to be 59.7 for males and 67.5 for females. It is worth noting that the value for males shows virtually no improvement from five years ago whereas the value for females has increased, which is also reflected in a vastly different incidence of widowhood (section 5.34). The full life tables for males and females are presented in Tables 5.5 and 5.6.

Table 5.5: Abridged life table for males based on estimated infant mortality rate -q(0), and using MORTPAK 4.1 (procedure MATCH), Kiribati Males: 2010

Age	m(x,n)	q(x,n)	l(x)	d(x,n)	L(x,n)	S(x,n)	T(x)	e(x)	a(x,n)
0	0.0521	0.0500	100000.0	5000.0	95931.2	0.9442	5971594.1	59.72	0.1863
1	0.0041	0.0161	95000.0	1533.2	376170.7	0.9868	5875662.8	61.85	1.5023
5	0.0013	0.0064	93466.8	593.9	465849.5	0.9940	5499492.1	58.84	2.5000
10	0.0011	0.0057	92873.0	526.7	463048.0	0.9929	5033642.6	54.20	2.5000
15	0.0018	0.0091	92346.2	837.5	459783.0	0.9888	4570594.6	49.49	2.6737
20	0.0027	0.0132	91508.8	1212.4	454640.8	0.9856	4110811.6	44.92	2.6054
25	0.0031	0.0154	90296.4	1390.3	448095.9	0.9832	3656170.8	40.49	2.5644
30	0.0037	0.0186	88906.1	1651.1	440564.4	0.9784	3208074.8	36.08	2.5979
35	0.0052	0.0255	87255.0	2221.3	431029.5	0.9689	2767510.4	31.72	2.6385
40	0.0077	0.0377	85033.7	3204.2	417631.2	0.9544	2336480.9	27.48	2.6477
45	0.0113	0.0551	81829.5	4505.3	398572.4	0.9307	1918849.7	23.45	2.6527
50	0.0179	0.0858	77324.3	6632.0	370936.9	0.8976	1520277.3	19.66	2.6350
55	0.0258	0.1217	70692.2	8605.5	332970.7	0.8486	1149340.5	16.26	2.6189
60	0.0410	0.1865	62086.7	11576.5	282556.1	0.7776	816369.8	13.15	2.5919
65	0.0605	0.2632	50510.2	13295.3	219705.0	0.6945	533813.7	10.57	2.5295
70	0.0865	0.3545	37214.9	13191.6	152583.2	0.6000	314108.7	8.44	2.4612
75	0.1192	0.4544	24023.3	10915.1	91552.4	0.4972	161525.5	6.72	2.3831
80	0.1625	0.5642	13108.2	7395.9	45519.9	0.3495	69973.1	5.34	2.2929
85	0.2336	...	5712.3	5712.3	24453.2	...	24453.1581	4.28	4.2808

Table 5.6: Abridged life table for females based on estimated infant mortality rate q(0), and using MORTPAK4.1 (procedure MATCH), Kiribati Females: 2010

Age	m(x,n)	q(x,n)	l(x)	d(x,n)	L(x,n)	S(x,n)	T(x)	e(x)	a(x,n)
0	0.0403	0.0390	100000.0	3900.0	96751.3	0.9570	6748806.6	67.5	0.1670
1	0.0027	0.0109	96100.0	1046.2	381743.3	0.9916	6652055.3	69.2	1.4605
5	0.0007	0.0033	95053.8	309.4	474495.7	0.9971	6270312.0	66.0	2.5000
10	0.0005	0.0026	94744.4	244.6	473110.7	0.9964	5795816.4	61.2	2.5000
15	0.0010	0.0050	94499.8	476.5	471406.7	0.9939	5322705.7	56.3	2.7076
20	0.0014	0.0070	94023.3	662.7	468543.5	0.9918	4851298.9	51.6	2.6265
25	0.0019	0.0094	93360.6	874.5	464703.3	0.9896	4382755.4	46.9	2.5991
30	0.0023	0.0115	92486.1	1066.7	459872.4	0.9866	3918052.1	42.4	2.6018
35	0.0031	0.0156	91419.4	1424.7	453714.8	0.9816	3458179.7	37.8	2.6260
40	0.0044	0.0217	89994.7	1951.4	445371.0	0.9736	3004464.8	33.4	2.6413
45	0.0065	0.0318	88043.4	2803.4	433633.4	0.9610	2559093.8	29.1	2.6516
50	0.0097	0.0473	85239.9	4033.1	416719.1	0.9419	2125460.4	24.9	2.6494
55	0.0146	0.0705	81206.8	5725.4	392522.7	0.9139	1708741.3	21.0	2.6401
60	0.0219	0.1043	75481.4	7871.1	358727.2	0.8725	1316218.6	17.4	2.6268
65	0.0334	0.1546	67610.3	10449.2	313000.8	0.8136	957491.4	14.2	2.6026
70	0.0501	0.2234	57161.1	12769.0	254659.1	0.7368	644490.6	11.3	2.5608
75	0.0738	0.3119	44392.0	13846.6	187632.5	0.6273	389831.5	8.8	2.5209
80	0.1159	0.4467	30545.5	13644.5	117703.3	0.4179	202199.0	6.6	2.4331
85	0.2000	...	16901.0	16901.0	84495.7	...	84495.7	5.0	4.9994

The estimated annual number of deaths can be derived by taking the age–specific death rate —the value of m(x,n) — in the two tables above and multiplying it by the corresponding male and female population in the same age group (Table 5.7). CDR is calculated by taking the total deaths in the population and dividing this by the total population and multiplying by 1,000. CDR is estimated to be 7.8 deaths per 1,000 population.

Table 5.7: Estimated number of deaths, and the crude death rate (CDR) based on life tables' age–specific death rate m(x,n) and the enumerated population by age and sex, Kiribati 2010

Age	Population			m(x,n)		Estimated deaths		
	Males	Females	Total	Males	Females	Males	Females	Total
0	1,555	1,441	2,996	0.0521	0.0403	81	58	139
1	5,571	5,425	10,996	0.0041	0.0027	23	15	38
5	5,739	5,287	11,026	0.0013	0.0007	7	3	11
10	6,198	5,968	12,166	0.0011	0.0005	7	3	10
15	5,582	5,344	10,926	0.0018	0.0010	10	5	16
20	5,242	5,124	10,366	0.0027	0.0014	14	7	21
25	4,070	4,346	8,416	0.0031	0.0019	13	8	21
30	3,223	3,498	6,721	0.0037	0.0023	12	8	20
35	2,682	2,943	5,625	0.0052	0.0031	14	9	23
40	2,908	3,208	6,116	0.0077	0.0044	22	14	36
45	2,519	2,715	5,234	0.0113	0.0065	28	18	46
50	1,813	2,079	3,892	0.0179	0.0097	32	20	53
55	1,349	1,578	2,927	0.0258	0.0146	35	23	58
60	919	1,066	1,985	0.0410	0.0219	38	23	61
65	642	878	1,520	0.0605	0.0334	39	29	68
70	470	770	1,240	0.0865	0.0501	41	39	79
75	181	324	505	0.1192	0.0738	22	24	45
80	97	175	272	0.1625	0.1159	16	20	36
85+	36	93	129	0.2336	0.2000	8	19	27
Total	50,796	52,262	103,058			462	347	808
CDR						9.1	6.6	7.8

5.3.3   Orphanhood

Information collected on the survival of parents and the survival of spouses can be used to make indirect estimate of adult mortality. Regarding the survival of parents, all respondents were asked whether their biological mother and father were still alive. The question regarding the respondent's marital status is used as a proxy to determine whether the person is widowed or not. Table 5.8 shows the population by age, sex and parental survivorship.

Figure 5.1 presents the proportion of the population with a mother and a father still alive, based on 2010 census data. The proportion of fathers still alive is lower than that of mothers still alive. In total, 77,530 mothers were still alive (75.2%) compared with 66,447 fathers still alive (64.5%). The results indicate that males, or fathers, are more likely to die earlier than mothers.

Table 5.8: Population by age, sex and parental survivorship, Kiribati 2010

Age/Sex	Mother and father living status							
	Mother				Father			
	Total	Yes	No	DK	Total	Yes	No	DK
Total	**103,058**	**77,530**	**25,302**	**226**	**103,058**	**66,447**	**36,276**	**335**
0–4	13,992	13,887	99	6	13,992	13,584	369	39
5–9	11,026	10,778	237	11	11,026	10,420	575	31
10–14	12,166	11,592	565	9	12,166	10,885	1,253	28
15–19	10,926	10,134	772	20	10,926	9,138	1,757	31
20–24	10,366	9,056	1,283	27	10,366	7,721	2,596	49
25–29	8,416	6,855	1,536	25	8,416	5,447	2,935	34
30–34	6,721	4,947	1,749	25	6,721	3,515	3,178	28
35–39	5,625	3,494	2,105	26	5,625	2,209	3,388	28
40–44	6,116	3,039	3,054	23	6,116	1,694	4,401	21
45–49	5,234	1,982	3,228	24	5,234	982	4,235	17
50–54	3,892	1,005	2,874	13	3,892	469	3,407	16
55–59	2,927	480	2,438	9	2,927	207	2,713	7
60–64	1,985	153	1,829	3	1,985	78	1,907	0
65–69	1,520	68	1,451	1	1,520	41	1,478	1
70–74	1,108	30	1,077	1	1,108	31	1,074	3
75+	1,038	30	1,005	3	1,038	26	1,010	2
Male Age								
Total	50,796	**39,032**	**11,662**	**102**	50,796	**33,479**	**17,140**	**177**
0–4	7,126	7,075	49	2	7,126	6,890	212	24
5–9	5,739	5,622	113	4	5,739	5,419	303	17
10–14	6,198	5,906	286	6	6,198	5,527	655	16
15–19	5,582	5,153	423	6	5,582	4,645	921	16
20–24	5,242	4,613	612	17	5,242	3,923	1,291	28
25–29	4,070	3,361	701	8	4,070	2,637	1,416	17
30–34	3,223	2,375	837	11	3,223	1,692	1,517	14
35–39	2,682	1,660	1,010	12	2,682	1,054	1,613	15
40–44	2,908	1,458	1,441	9	2,908	801	2,099	8
45–49	2,519	957	1,548	14	2,519	474	2,035	10
50–54	1,813	488	1,319	6	1,813	241	1,565	7
55–59	1,349	237	1,109	3	1,349	98	1,249	2
60–64	919	71	845	3	919	36	883	0
65–69	642	34	608	0	642	21	621	0
70–74	428	10	418	0	428	10	417	1
75+	356	12	343	1	356	11	343	2

Table 5.8: Population by age, sex and parental survivorship, Kiribati 2010 (continued)

Age/Sex	Mother and father living status							
	Mother				Father			
	Total	Yes	No	DK	Total	Yes	No	DK
Female Age								
Total	52,262	38,498	13,640	124	52,262	32,968	19,136	158
0–4	6,866	6,812	50	4	6,866	6,694	157	15
5–9	5,287	5,156	124	7	5,287	5,001	272	14
10–14	5,968	5,686	279	3	5,968	5,358	598	12
15–19	5,344	4,981	349	14	5,344	4,493	836	15
20–24	5,124	4,443	671	10	5,124	3,798	1,305	21
25–29	4,346	3,494	835	17	4,346	2,810	1,519	17
30–34	3,498	2,572	912	14	3,498	1,823	1,661	14
35–39	2,943	1,834	1,095	14	2,943	1,155	1,775	13
40–44	3,208	1,581	1,613	14	3,208	893	2,302	13
45–49	2,715	1,025	1,680	10	2,715	508	2,200	7
50–54	2,079	517	1,555	7	2,079	228	1,842	9
55–59	1,578	243	1,329	6	1,578	109	1,464	5
60–64	1,066	82	984	0	1,066	42	1,024	0
65–69	878	34	843	1	878	20	857	1
70–74	680	20	659	1	680	21	657	2
75+	682	18	662	2	682	15	667	0

Figure 5.1: Proportion of the population with mother and father still alive, Kiribati 2010
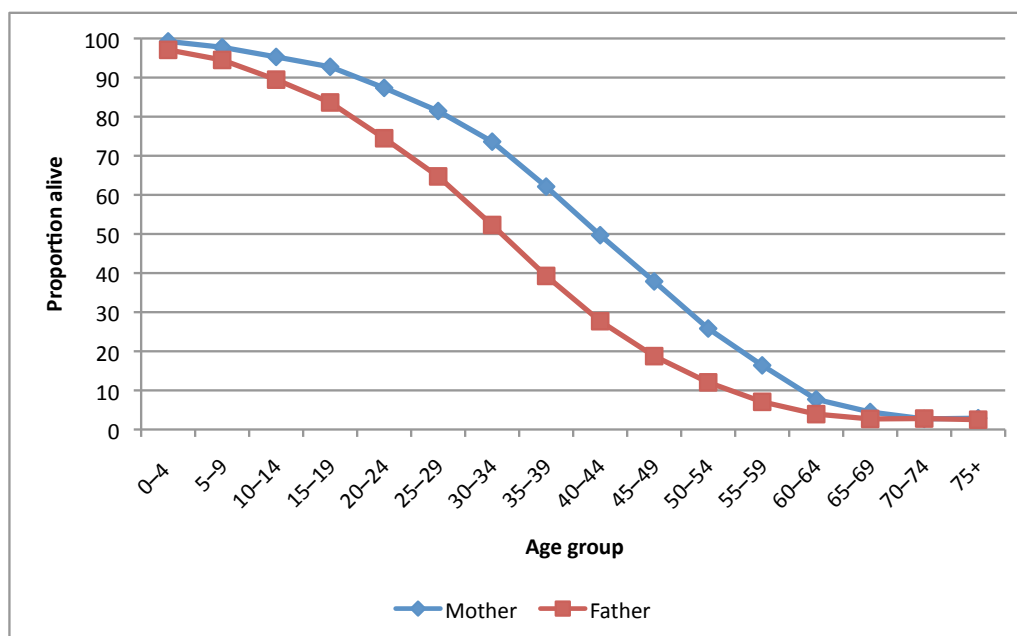
5.3.4 Widowhood

Information on widowhood is displayed in Table 5.9 and Figure 5.2. The proportion of widowhood is much higher for women than for men, particularly in older ages. The proportion of women widowed begins increasing at the age of 40 (with 203 widowed women) and continues to rise in older ages. The higher level of widowhood for women is explained by the fact that mortality is much higher for men than for women in Kiribati.

Table 5.9: Population aged 15 and over by five-year age group and proportion widowed, Kiribati 2010

Age group	Population			Widowed		
	Males	**Females**	**Total**	**Males**	**Females**	**Total**
15–19	5,582	5,344	10,926	7	33	40
20–24	5,242	5,124	10,366	25	76	101
25–29	4,070	4,346	8,416	24	92	116
30–34	3,223	3,498	6,721	17	90	107
35–39	2,682	2,943	5,625	20	116	136
40–44	2,908	3,208	6,116	32	203	235
45–49	2,519	2,715	5,234	52	253	305
50–54	1,813	2,079	3,892	57	354	411
55–59	1,349	1,578	2,927	67	416	483
60–64	919	1,066	1,985	65	341	406
65–69	642	878	1,520	76	427	503
70–74	428	680	1,108	88	363	451
75+	356	682	1,038	84	435	519
Total	**31,733**	**34,141**	**65,874**	**614**	**3,199**	**3,813**

Figure 5.2: Population aged 15 and older by sex, age group and proportion widowed, Kiribati 2010
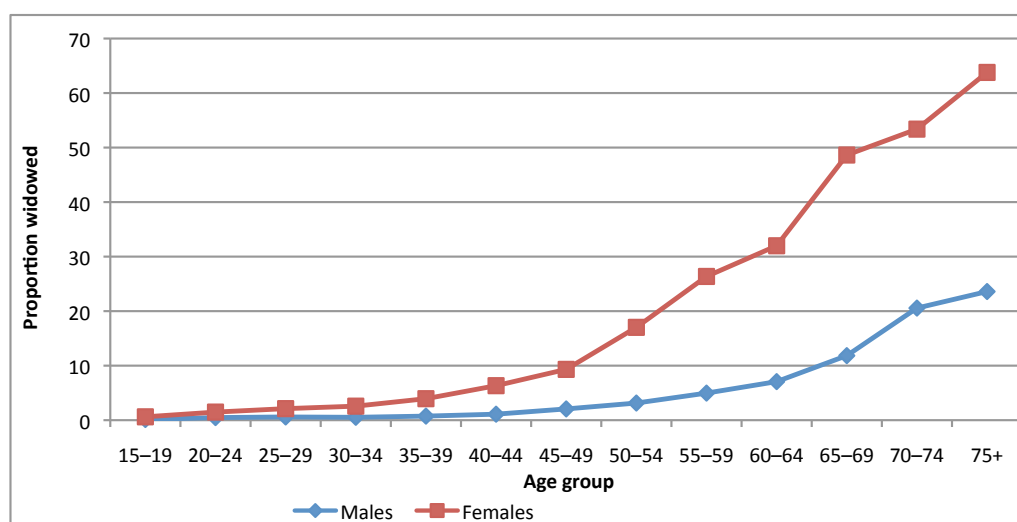
Chapter 6: Migration

6.1   Introduction

Migration is a form of geographic or spatial mobility that involves the changing of a person's usual residence between a clearly defined geographic area in a specified given time. In particular, migration is a third factor — besides fertility and mortality — that affects not only the growth and decline of a population, but also the demographic characteristics of the areas of origin and destination. Hence, knowledge of migration is required in order to analyse the changes in a population's size and characteristics. These types of information are useful for policy-makers as basis from which to develop strategic plans that deal with population changes caused by migration.

This chapter presents the estimated level of two broad types of migration: internal and international. A discussion on data sources of the two types of migration is presented and is followed by a description of the procedures used to estimate the level of migration in Kiribati.

6.2   Internal migration

Internal migration refers to the movement of people within Kiribati. During the 2010 census, people were asked about their place of birth, usual residence, and home island. The level of internal migration in Kiribati is estimated by comparing: place of enumeration vs place of usual residence; place of birth vs place of enumeration; place of enumeration vs place of residence one year prior to the census. The data collected on place of enumeration by place of residence one year prior to the census was not analysed due to some inconsistencies in the data. The question on place of residence one year prior to the census should be asked of all persons aged one year and above but instead was asked of all persons aged 3 years above.

6.2.1   Usual place of residence
Of Kiribati's total 2010 population (103,058), 95% stated that their usual place of residence was the same as their place of enumeration; only 4% were enumerated in the place that was not their usual residence. Some 183 people stated that their usual place of residence was overseas; the majority of these people were enumerated in South Tarawa (Table 6.1).

Table 6.1: Population by place of enumeration and by place of usual residence, Kiribati 2010

Island of enumeration	Usual residence			
	Same residence	Elsewhere	Overseas	Total
Banaba	242	53	0	**295**
Makin	1,792	6	0	**1,798**
Butaritari	3,774	572	0	**4,346**
Marakei	2,801	70	1	**2,872**
Abaiang	5,341	161	0	**5,502**
North Tarawa	5,622	476	4	**6,102**
South Tarawa	48,504	1,569	109	**50,182**
Maiana	1,989	37	1	**2,027**
Abemama	2,902	303	8	**3,213**
Kuria	965	15	0	**980**
Aranuka	1,018	39	0	**1,057**
Nonouti	2,420	253	10	**2,683**
North Tabiteuea	3,624	65	0	**3,689**
South Tabiteuea	1,240	50	0	**1,290**
Beru	2,068	31	0	**2,099**
Nikunau	1,872	35	0	**1,907**
Onotoa	1,504	15	0	**1,519**
Tamana	934	17	0	**951**
Arorae	1,272	6	1	**1,279**
Teeraina	1,576	112	2	**1,690**
Tabuaeran	1,873	84	3	**1,960**
Kiritimati	5,005	537	44	**5,586**
Kanton	31	0	0	**31**
Total	**98,369**	**4,506**	**183**	**103,058**

6.2.2 *Lifetime migration (place of birth)*

Table 6.2 presents the population by place of enumeration and by place of birth in 2010, illustrating the lifetime migration of current residents. The data show that 57% of the total population were counted in their place of birth. About 40% were enumerated in another island in Kiribati — different from their place of birth — and 3% stated that their place of birth was outside of Kiribati, with most of those people current residing in South Tarawa (Table 6.2).

Table 6.2: Population by place of enumeration and place of birth, Kiribati 2010

Place of enumeration	Place of birth			Total
		Elsewhere		
	Same place	In Kiribati	Overseas	
Banaba	113	146	36	**295**
Makin	1,418	366	14	**1,798**
Butaritari	3,136	1,159	51	**4,346**
Marakei	2,301	556	15	**2,872**
Abaiang	3,785	1,653	64	**5,502**
North Tarawa	3,322	2,662	118	**6,102**
South Tarawa	27,113	21,166	1,903	**50,182**
Maiana	1,353	653	21	**2,027**
Abemama	1,601	1,535	77	**3,213**
Kuria	368	575	37	**980**
Aranuka	558	464	35	**1,057**
Nonouti	1,636	991	56	**2,683**
North Tabiteuea	2,731	910	48	**3,689**
South Tabiteuea	848	429	13	**1,290**
Beru	1,434	636	29	**2,099**
Nikunau	1,201	665	41	**1,907**
Onotoa	981	503	35	**1,519**
Tamana	637	292	22	**951**
Arorae	815	430	34	**1,279**
Teeraina	761	904	25	**1,690**
Tabuaeran	725	1,208	27	**1,960**
Kiritimati	2,134	3,286	166	**5,586**
Kanton	1	29	1	**31**
Total	**58,972**	**41,218**	**2,868**	**103,058**

Table 6.3: Population by place of enumeration and place of birth, Kiribati 2010

Place of enumeration	Place of birth				
	South Tarawa	Gilberts group (excl. South Tarawa)	Line & Phoenix group	Overseas	Total
South Tarawa	27,113	20,006	1,160	1,903	**50,182**
Gilberts group (excluding South Tarawa)	6,611	35,760	492	746	**43,609**
Line & Phoenix group	1,719	3,152	4,177	219	**9,267**
Total	**35,443**	**58,918**	**5,829**	**2,868**	**103,058**

As can be seen in Table 6.3, 34% (35,443) of people reported that their place of birth was South Tarawa, 57% (58,918) claimed that they were born in the Gilbert group and only 6% (5,829) said that their place of birth was in the Line and Phoenix group. Of the 35,443 people born in South Tarawa, 76% were recorded in South Tarawa at the time of the census, 19% enumerated in the Gilbert group and 5% in the Line and Phoenix group.

Of the total number of people whose place of birth was the Gilbert group (58,918), 34% resided in South Tarawa and 5% resided in the Line and Phoenix group. The vast majority of people born in the Line and Phoenix group were residing there (72%), with 20% enumerated in South Tarawa and 8% in the Gilbert group.

Table 6.4 illustrates the lifetime net migration of current Kiribati residents, between South Tarawa (urban), the remaining islands in the Gilbert group, and Line and Phoenix group. Overall, South Tarawa recorded a net gain of 14,739 people, mainly from other islands in the Gilbert group. The Line and Phoenix group had a net gain of 3,438 people, whereas the Gilbert group had a net loss of 15,309 people.

Table 6.4: Interregional lifetime migration, Kiribati 2010

Place of enumeration	In-migrants (from within Kiribati)	Immigrants (from overseas)	Out-migrants (from within Kiribati)	Net migrants
South Tarawa	21,166	1,903	8,330	14,739
Gilberts group	7,103	746	23,158	-15,309
Line & Phoenix group	4,871	219	1,652	3,438
Net migrants (within Kiribati)	33,140		33,140	0
Overseas/place unknown		2,868		2,868

6.3   International migration

International migration is the movement of people across national boundaries for the purpose of establishing a new residence. International migration has two components: emigration and immigration. Emigration is the movement of people *out of* the country, whereas immigration is the movement of people *into* the country.

Data on international migration for many developing countries, including Kiribati, are non-existent or of poor quality. Because data can be unavailable or unreliable, measuring the level of international migration is best done using data collected from censuses or surveys that have similar migration-related questions. The other common approach in estimating the level of international migration is by applying indirect estimation of net migration using the population balancing equation.

The 2010 census included migration-related questions that were used to estimate the level of immigration. All people staying in Kiribati during the census night were asked about their:
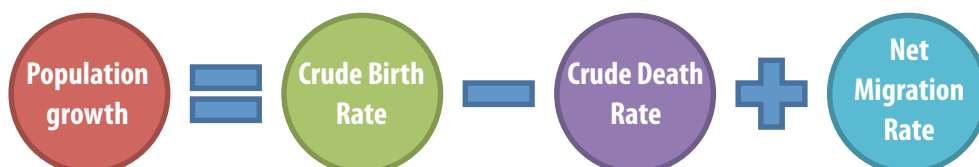- place of birth,
- home island, and
- place of residence in the year prior to the 2010 census.

In response to the question on place of birth, only 6% (2,868) stated that they were born outside of Kiribati. Of those, 1,446 stated that their place of birth given was Nauru, and 486 were born in Fiji.

Those who said their home island was overseas accounted for 1% (972).

6.3.1 *Indirect estimation of net migration*

In the absence of accurate migration statistics, the population balancing equation is a useful method to estimate intercensal net migration. The population balancing equation is:

$$\text{Population growth} = \text{Crude Birth Rate} - \text{Crude Death Rate} + \text{Net Migration Rate}$$

The net migration rate is:

$$\text{Net Migration Rate} = \text{Population growth} - \text{Crude Birth Rate} + \text{Crude Death Rate}$$
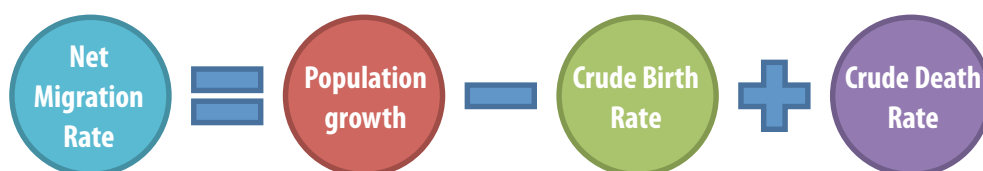
The annual population growth rate between the 2005 and 2010 censuses was estimated to be 2.2% . CBR was 31.1 and CDR was 7.8. Applying the population balancing equation, net migration is calculated to be:

Net migration rate = 22.0 - 31.1 + 7.8 = - 1.3 ($^0/_{00}$)

Based on the equation above, the net migration rate for Kiribati is -1.3/1,000 per year, translating into -0.13%, indicating a small net loss of 134 people per year between the 2005 and 2010 censuses. Some of these people would be accounted for by the New Zealand–Kiribati migration scheme introduced in 2002 and known as the Pacific Access Category scheme, which provides an opportunity for 75 Kiribati residents to move to New Zealand each year. Other opportunities arise from I-Kiribati nationals marrying foreign nationals and resettling overseas, and increasing annual net outflows in recent years may also reflect a greater number of people seeking education and employment opportunities abroad.

Chapter 7: Social characteristics

7.1 Religious affiliation

In Kiribati, 56% (57,503) of the population is Catholic, 34% (34,528) belong to the Kiribati Protestant Church, and 5% (4,802) are Mormons. Other religions with more than 2,000 members are the Bahai (2,322) and Seventh-Day Adventist (2,085).

In addition, 51 people said that they did not belong to any religious group, while 212 people did not state their religious affiliation. Similarly, 421 people refused to state their religious affiliation.

Table 7.1: Population by religious affiliation and sex – Kiribati 2010

Religious affiliation	Sex			Percent of total population		
	Male	Female	Total	Male	Female	Total
Catholic	28,322	29,181	**57,503**	55.8	55.8	**55.8**
Kiribati Protestant Church	17,045	17,483	**34,528**	33.6	33.5	**33.6**
Seven Day Adventist	1,007	1,078	**2,085**	2.0	2.1	**2.0**
Church of God	164	196	**360**	0.3	0.4	**0.3**
Mormon	2,342	2,460	**4,802**	4.6	4.7	**4.6**
Assembly of God	197	193	**390**	0.4	0.4	**0.4**
Bahai	1,175	1,147	**2,322**	2.3	2.2	**2.3**
Te koaua	202	219	**421**	0.4	0.4	**0.4**
Muslim	65	54	**119**	0.1	0.1	**0.1**
None	33	18	**51**	0.1	0.0	**0.1**
Not stated	119	93	**212**	0.2	0.2	**0.2**
Other	125	140	**265**	0.2	0.3	**0.2**
Refused	202	219	**421**	0.4	0.4	**0.4**
Total	**50,796**	**52,262**	**103,058**	**100.0**	**100.0**	**100.0**

Table 7.2 shows the population by religious affiliation in the last three census years. As the population size increased, so did membership to almost all religious organisations.

Table 7.2: Population by religious affiliation and census years

Religious affiliation	Census years		
	2000	**2005**	**2010**
Catholic	46,108	51,144	57,503
Kiribati Protestant Church	31,221	33,042	34,528
Seventh-day Adventist	1,402	1,756	2,085
Church Of God	522	364	360
Mormon	2,307	2,910	4,802
Assembly of God	*	*	390
Bahai	2,052	2,034	2,322
Te koaua	*	*	421
Muslim	*	*	119
None	*	23	51
Not Stated	*	22	212
Other	883	1,238	265
Refused	*	*	421

* These religious affiliations were grouped under "Other" categories

7.2   Marital status

All censuses in Kiribati ask questions about marital status. For the resident population in 2010, this information is presented in Figure 7.1. In the 2010 census, the category 'Married' was defined to include those people living in a consensual (*de facto*) relationship, including those living under a traditional union arrangement.

The results show that 19,678 males and 21,169 females aged 15 and older shown are married. The proportion of never married (single) males was 33% (10,346) and was 23% (7,803) for females. Widowed males accounted for 2% (614) of the population aged 15 and over, and widowed females 9% (3,199).

Figure 7.1: Population aged 15 and over by marital status and sex, Kiribati 2010

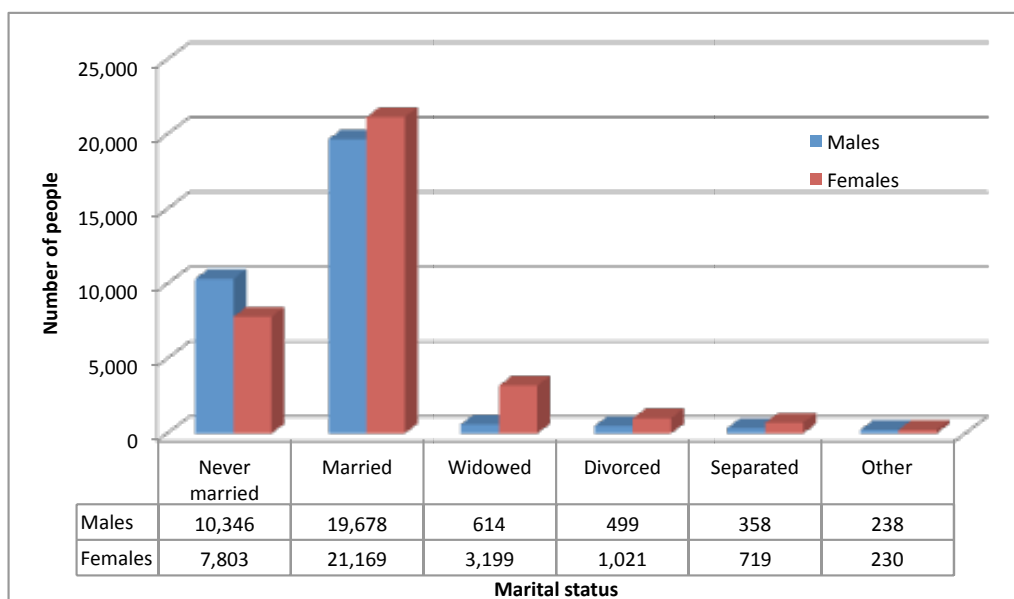| Marital status	Never married	Married	Widowed	Divorced	Separated	Other
Males	10,346	19,678	614	499	358	238
Females	7,803	21,169	3,199	1,021	719	230

Table 7.3 shows the percent of never married people aged 15 and over by age group and gender. Overall, the proportion of never married was high at 85% in the 15–19 age group, declining to less than one-half of the total population in the 20–24 age group. By age 35, marriage is almost universal in Kiribati with just over 7% of the population estimated to be 'never married'. Table 7.3 shows that females are more likely to be married than males in almost all age groups.

Table 7.3 also presents the singulate mean age at marriage (SMAM) for the total population (22.7 years) and differentials by gender (24.0 years for males, 21.5 years for females). The results indicate that females marry earlier than males, with females more likely to have married by age 22 (on average), which is 3 years earlier than for males. SMAM for females in 2005 was 22.2 and was slightly lower in 2010 at 21.5.

Figure 7.2 presents the proportion of the population aged 15 and over by gender who are widowed. As can be seen, a much higher proportion of females are widowed than males. Widowed females become prevalent in the 35–39 age group, and rapidly increase thereafter, reflecting higher rates of adult male mortality in Kiribati. That is, the higher proportion of females widowed could be explained by the fact that the mortality level for women is much lower than for. The mean age at marriage indicates that men are more likely to be married later than females and tend to die earlier than their younger wives.

Table 7.3: Percent never married by age group and sex, and singulate mean age at marriage (SMAM) by sex – Kiribati 2010

Age group	Sex		
	Males	**Females**	**Total**
15–19	89.6	81.0	85.4
20–24	56.3	37.7	47.1
25–29	26.4	13.8	19.9
30–34	13.7	6.6	10.0
35–39	9.0	5.4	7.1
40–44	7.3	4.5	5.8
45–49	5.3	4.3	4.8
50–54	5.3	4.1	4.7
55–59	4.4	3.9	4.1
60–64	5.4	5.1	5.2
65–9	5.6	3.4	4.3
70–74	5.8	4.3	4.9
75–79	8.5	5.6	6.6
80–84	2.1	3.4	2.9
85+	8.3	8.6	8.5
SMAM	**24.0**	**21.5**	**22.7**

Figure 7.2: Population aged 15 and over by sex and proportion widowed, Kiribati 2010
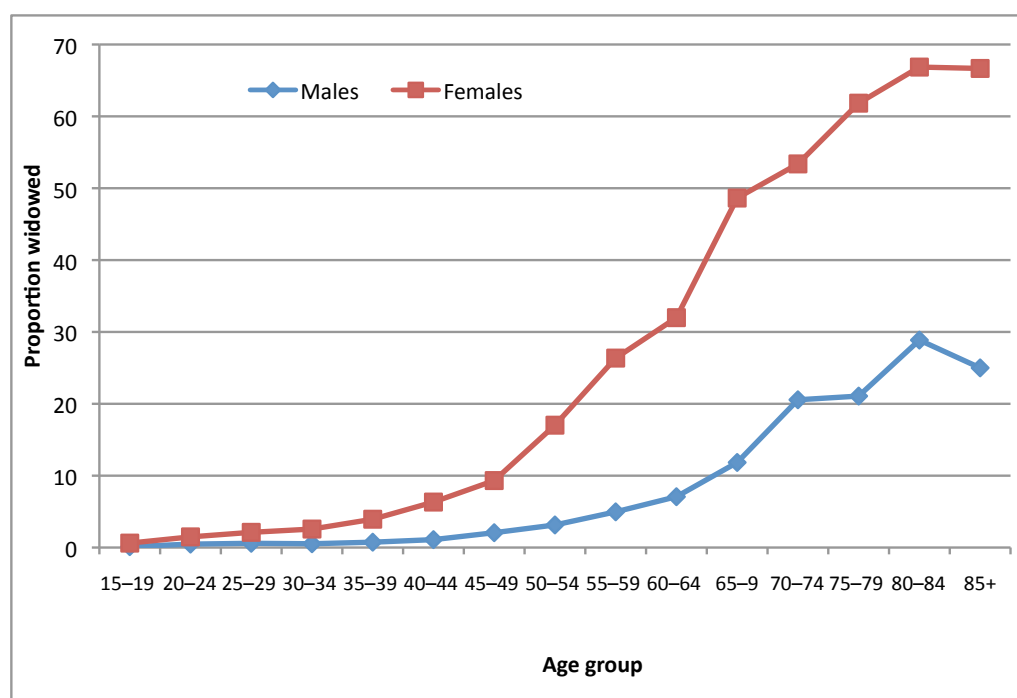
7.3   Health

The Kiribati 2010 census questionnaire included health questions related to the respondent's smoking habits, and alcohol and kava (*yagona*) consumption. All individuals aged 15 and over in the household were asked these substance use questions.

7.3.1   Smoking tobacco

About one in five people (20%) in the 15–19 age group claim to be regular smokers (having one packet or more cigarettes a day). By ages 25–44, more than 40% are regular smokers, and by age 45–59 over one-half consider themselves to be regular smokers. Interestingly, the proportion of people who are regular smokers declines in the older ages (60 and over; see Figure 7.3), which could be due to health complications or early death.

More men than women in all age groups are smokers.

Figure 7.3: Proportion of the population aged 15 and over who regularly smoke tobacco,– Kiribati 2010
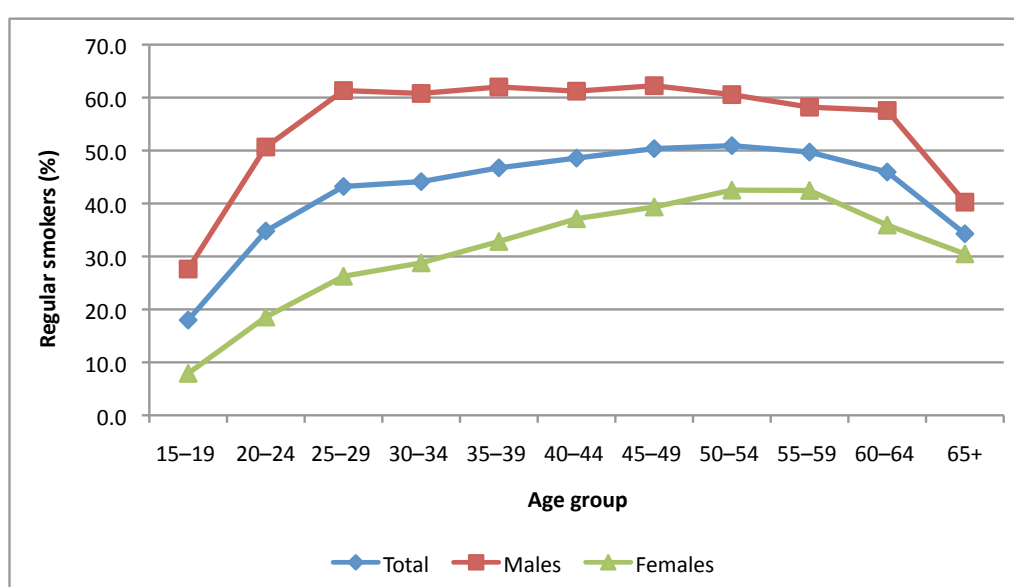
7.3.2   Alcohol consumption

About 8% of males and 1% of females are regular (drinking everyday) alcohol (includes beer, spirits as well as toddy and kava) drinkers. A high proportion of both male and female drinkers are more likely to be younger, aged 15–29 (Fig. 7.4).

Figure 7.4: Proportion of population aged 15 and over who regularly drink alcohol, Kiribati 2010
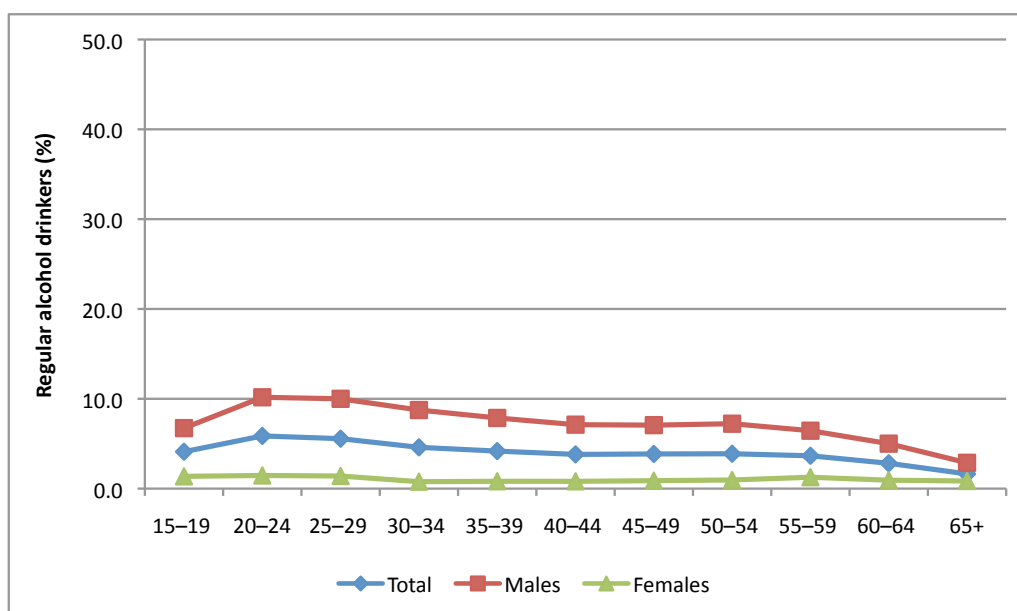
In contrast, more people reportedly consume alcohol occasionally or sometimes (from time to time when there is excess cash or when invited by friends). More than 40% of males in the 20–34 age group drink alcohol sometimes, compared with less than 10% of females in almost all age groups.

Figure 7.5: Proportion of population aged 15 and over who occasionally drinks alcohol, Kiribati 2010
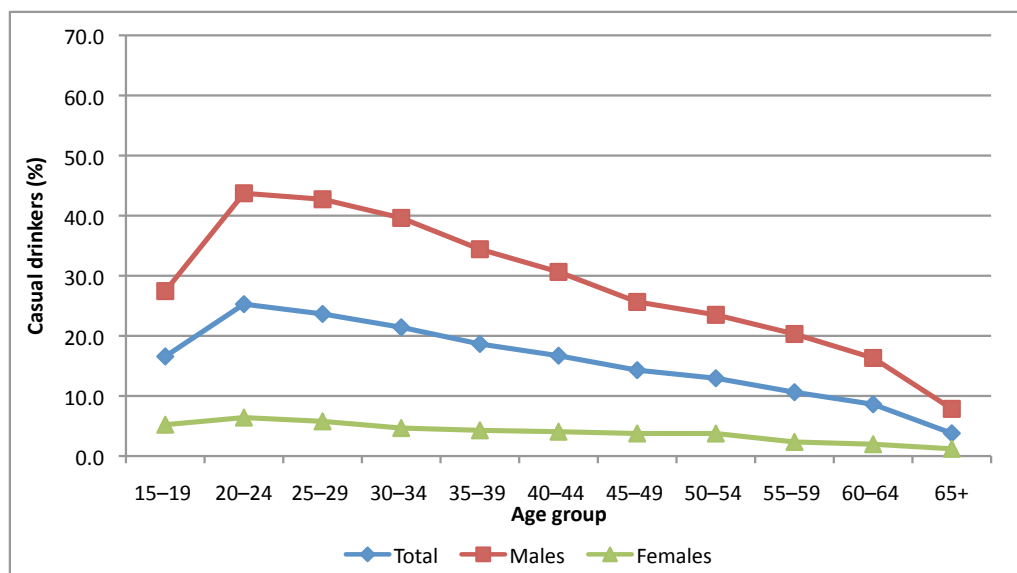
7.3.3   *Kava/*Yagona *consumption*

In recent years, kava (or *yagona*) drinking has increased. According to 2010 census data, more than 10% of males in the 20–59 age group are regular kava drinkers. In contrast, less than 3% of females in all age groups are kava drinkers.

Figure 7.6: Proportion of the population aged 15 and over who regularly drinks kava, Kiribati 2010
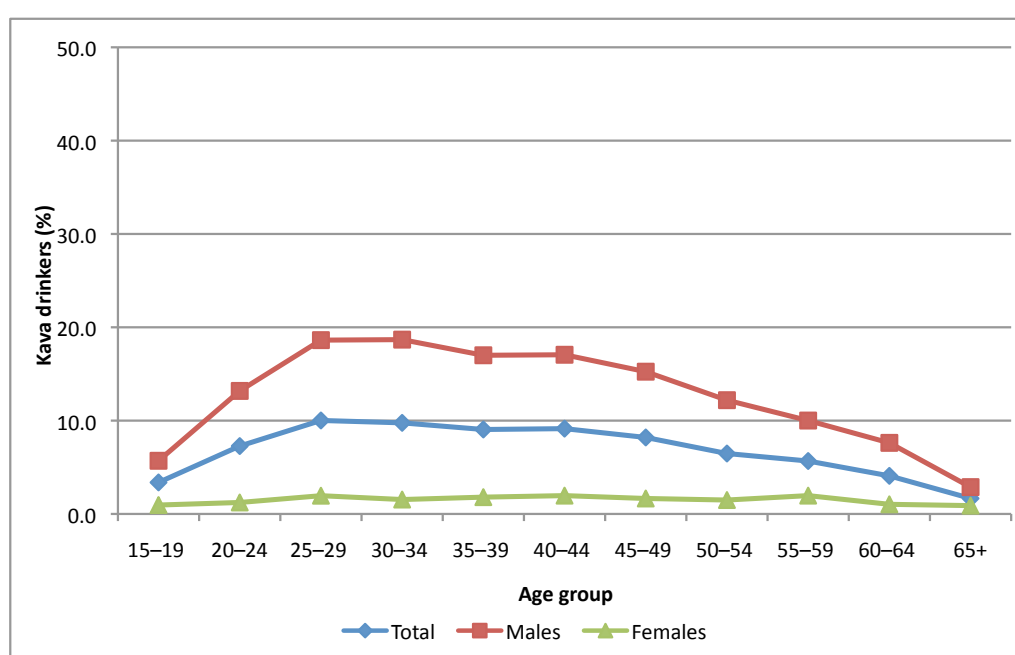

7.4   Education and literacy

The main objective of Kiribati's national education policy is to provide **an education system that achieves high quality standards** and **broad coverage,** and is **relevant and cost-effectives in delivering education services. In line with international goals** to achieve universal primary education (e.g. Millennium Development Goals), primary level education in Kiribati is provided free, and the government also provides subsidies for secondary schools in other private education institutions to ensure that education is universal. Providing free access to education in Kiribati provides greater opportunities for children in the school-age population to have access to basic primary and secondary education.

7.4.1   School attendance status

Based on question about current school attendance, respondents were categorised into three main groups as shown in Table 7.4: 1) those who are currently attending school, 2) those who left school, and 3) those who have never been to school. Information on school attendance was collected from all individuals aged 3 years and over who were residing in Kiribati during the 2010 census. Table 7.4 presents the population — aged 6 years and older — by school attendance and by gender (*not* aged 3 years and older).

Table 7.4: Population aged 6 and over, and 15 and over by sex and by school attendance status, Kiribati 2010

School attendance status	Aged 6 years and over				Aged 15 years and over		
	Total	Males	Females		Total	Males	Females
At school	29.9	30.2	29.7		10.6	10.3	10.8
Left school	63.5	63.4	63.6		81.8	82.5	81.1
Never been to school	6.6	6.5	6.7		7.7	7.2	8.1
Total	**100**	**100**	**100**		**100**	**100**	**100**

About 7% of the total population aged 6 and over and 8% of the aged 15 and over stated that they had never attended any school. While 3 out of 10 people aged 6 and over attended school, more than one-half of all people (63.5%) had left school early.

According to the 2010 census, 25,939 people aged 6 and over attend school; of these, 12,781 are males and 13,158 are females. More than 90% of those aged 6–11 attend school (Fig. 7.7). The proportion of those attending school declines by age 13. In contrast, less than one-quarter of all 15-year-olds and less than one-half of all 18-year-olds reported that they do not attend any school. School attendance level is higher for females than for males.

Figure 7.7: Population aged 5 and over attending school, by sex – Kiribati 2010
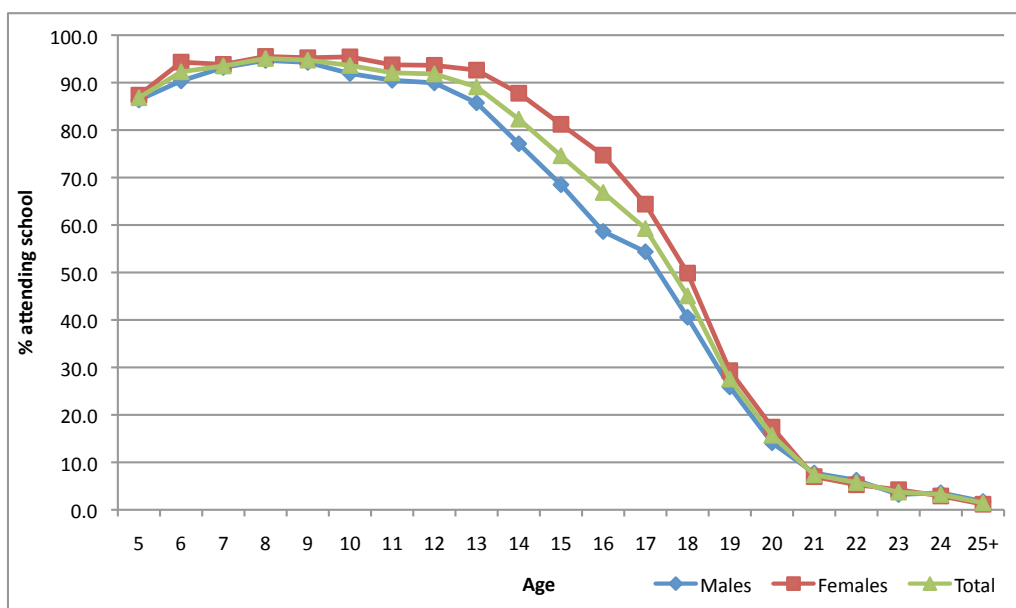
7.4.2   Educational attainment

The Kiribati 2010 census collected information on educational attainment, which is the level of education each individual aged 15 and over reached or achieved at the time of the census. The results are presented in Figure 7.8.

Although primary education is provided free in Kiribati, less than one-half of the population aged 15 and over (31% males, 30% females) had attained a primary level education. Only 3.5% of males and 2.8% of females had achieved a tertiary level education.

About 56% of males and 57% of females had attained a secondary level education. More females than males had no education.

Figure 7.8: Population aged 15 and over by educational attainment and sex - 2010
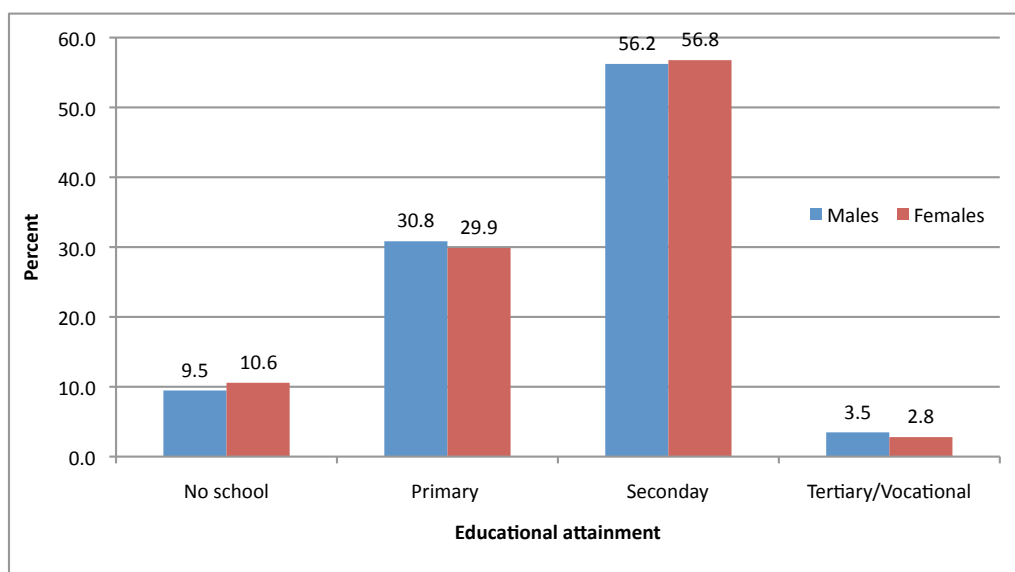
7.4.3   Literacy

Literacy refers to a person's ability to read and write a short, simple sentence in any language. For the Kiribati 2010 census, literacy was measured by a person's ability to read and write in any of the following languages: Kiribati, English and other languages.

The results in Table 7.5 provide the literacy rates for people aged 10 and over living in urban and rural Kiribati. Kiribati's total literacy rate is 98%, and is higher in the urban area (99%) than in rural areas or outer islands (97%). There are no literacy differences between males and females.

Table 7.5: Literacy rate by region and sex, Kiribati 2010

Region	Males	Females	Total
Urban	98.6	98.5	98.6
Rural	96.9	97.0	96.9
Kiribati	**97.7**	**97.8**	**97.7**

The literacy rate by gender and age groups — shown in Figure 7.9 — indicates that more than 80% of all people aged 10–34 are literate. Higher literacy rates are observed for females in aged 10–34 than for males. Literacy rates among females aged 35 and over are low compared males.

Figure 7.9: Literacy rate by age group and sex - 2010
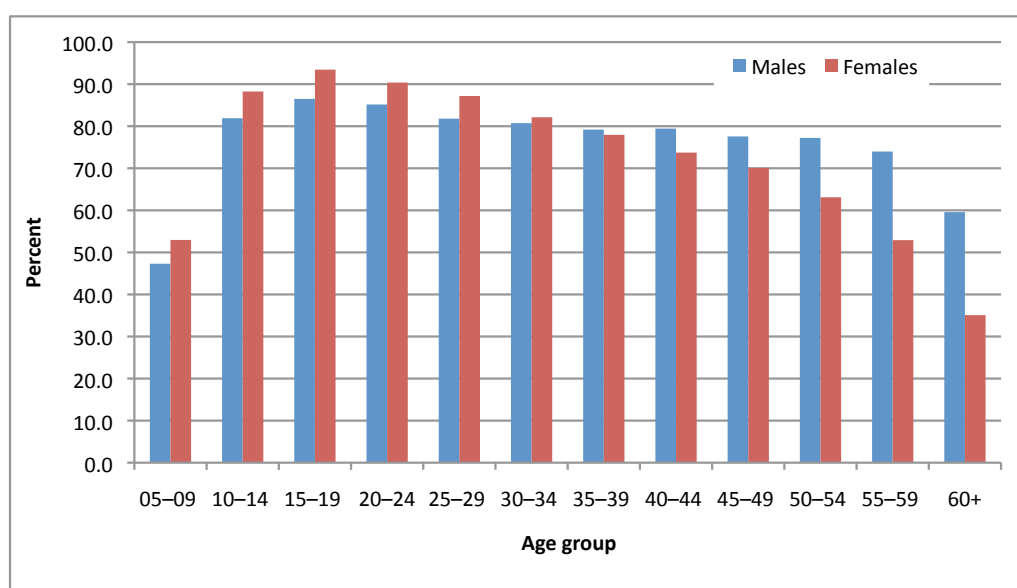
7.5   Internet use

Information on Internet use was also collected during the 2010 census. Everyone aged 15 and over was asked about their use of the Internet in the week prior to the census. Figures 7.10, 7.11 and 7.12 summarise and present the results.

Out of the total population of people aged 10 and older (78,040), about 15% (11,387) stated that they used the Internet during the week prior to the census date. The proportion of males and females using the Internet were equal at 15%.

Internet use started earlier with the proportion of 14% in the 10–14 age group having used the Internet in the week prior to the census. Internet use was highest among those aged 15–19, with more females (30.6%) than males (25.4%) using the Internet. Overall, Internet use was comparatively high for younger females aged 15–34 and for older males aged 40–50 years and over (Fig. 7.10).

Figure 7.10: Proportion of the population aged 10 and older by age group, sex and Internet use, Kiribati 2010
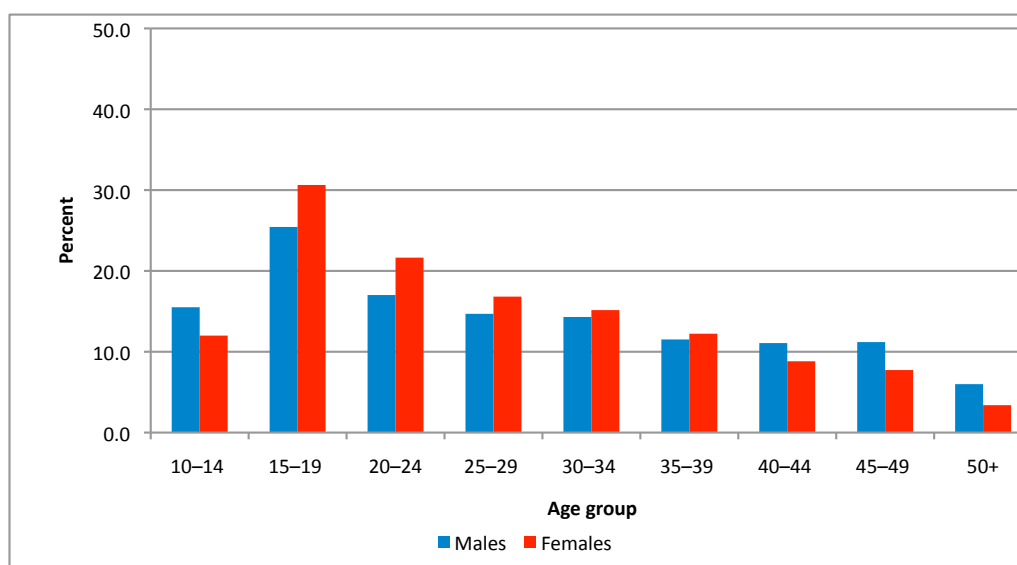
Respondents who used the Internet in the week prior to the census, were asked about the place where they used or accessed the Internet. Most users had access through Internet cafés (48.6% males, 43.7% females). One-quarter of them access the Internet at work. One out of every five people (i.e. 20%) access the Internet from home (Fig. 7.11).

Figure 7.12 shows that Internet use is higher in the urban area (South Tarawa) than in rural areas (outer islands). Also, there is little difference in the proportion of males and females who used the Internet in the week prior to the census by region.

Figure 7.11: Proportion of the population aged 10 and over who use the Internet, by place of Internet use, Kiribati 2010

Figure 7.12: Population aged 10 and over who use the Internet, by sex and region, Kiribati 2010

7.6 Economic activity

7.6.1 Background

Economic activity and employment are shaped by many factors, including the size of the working-age population, specific community, educational and skill level of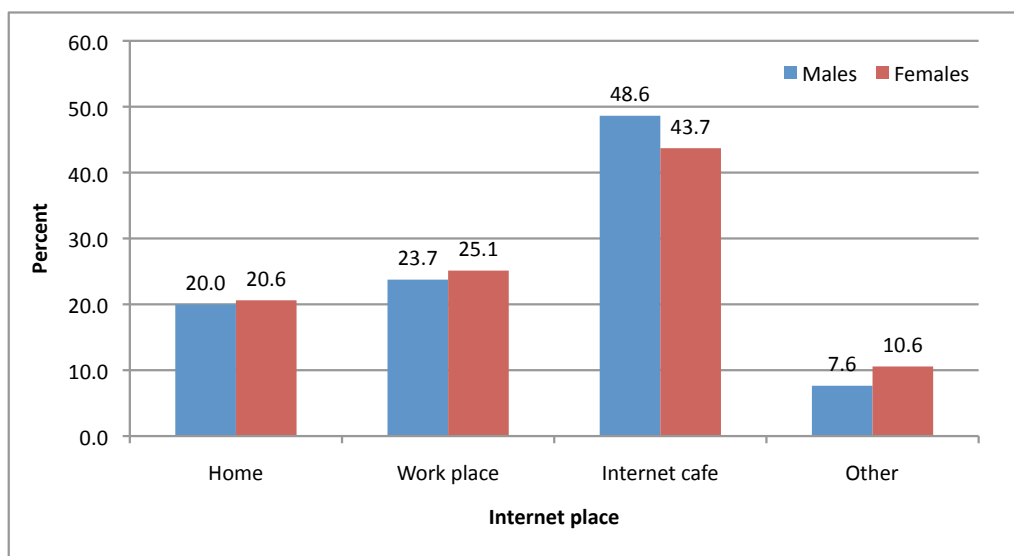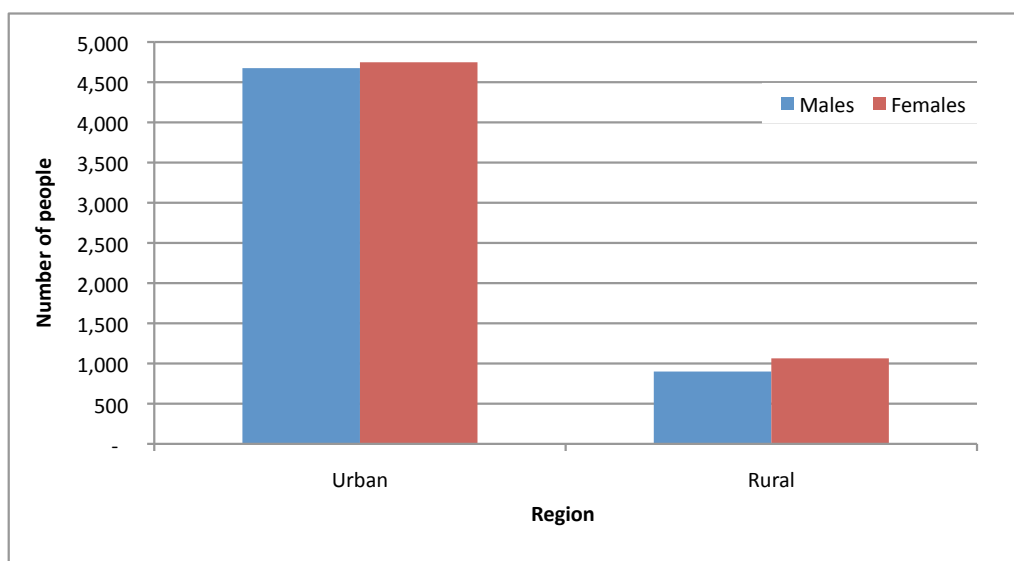 the labour force, and the availability of economic resources (e.g. access to employment). Integrating population factors into economic and social development strategies is vital to achieve sustainable development outcomes and improve the quality of life. In order to pursue such objectives, Kiribati's policy-makers and planners and their development partners require quality data on economic and labour market activities, such as employment and unemployment, the size and characteristics of the labour force, as well as information about those not in the labour force. This information is of fundamental importance because it provides an indication of the size of the labour supply for the production of goods and services in a country, and provides much needed benchmarks and baseline information against which to measure people's general well-being and standard of living, and monitor development progress.

To provide this information, population and housing censuses, and household surveys include a series of questions on labour market activities undertaken by people over 15. The Kiribati 2010 census included a series of eight questions (Questions #24–32) relating to an individual's economic activity. All individuals 15 and over were asked about their work during the week prior to the census, with work being any kind of work or activity that provides the necessities of life.

The census included questions about paid and unpaid work, and took into account community activities and unpaid family work, and people who produce goods for sale or for their own consumption. People not actively engaged in any activity were asked if they were actively looking for or were available to work. Responses resulted in the following broad categories.

- *Work for pay* — A person who works for wages, salary, commission, or has a contract, or are operating a business. The person is either a government or private employee, an employer, or self-employed.
- *Voluntary work and unpaid family work* — A person who works but does not receive a wage, salary, commission, and does not have a contract. This also includes village workers.
- *Work to support the household by producing goods for sale* — A person who performs a variety of task,s such as fishing, farming, gardening, producing handicrafts and other products for sale to support the household.
- *Work to support the household by producing goods for own consumption* — A person who performs tasks such as fishing, farming, gardening, cutting copra, or produces other goods for household consumption only (also referred to as subsistence activities).
- *People who did not work* — Such as person was asked whether they were looking for work and if so, whether they were available; and if neither applied, what they were doing. This question allows the census to capture unemployment, as well as people not in the labour force, such as full-time homemakers, students, retired people and those unable to work because of an illness or disability.

7.6.2 Economic activity framework

The current official working age group in Kiribati is 15–50. In contrast, the international standard working age is 15–64. For the purpose of this analysis, the working age group referred to is 15 and over, and is divided into two main groups: those who are in the labour force (economically active population) and those who are not in the labour force (economically inactive population). The labour force comprises people who are employed and not employed but who are actively looking for work and are available to work. Figure 7.13 illustrates the relationship between the total population aged 15 and over, the labour force (employed and unemployed), and the population not in the labour force.

7.6.3 People of working age — background characteristics

Out of Kiribati's total 2010 population (103,058), the working age group (15 and over) accounted for 64% (65,874), consisting of 31% males (31,733) and 33% females (34,141). The working age group is composed mostly of people in the 20–29 and 40–64 age groups.

Table 7.6 shows that the working force population is nearly distributed by region.

Table 7.6: Working population aged 15 and over by background characteristics, Kiribati 2010

Age group	Males	Females	Total
15–19	17.6	15.7	16.6
20–29	29.3	27.7	28.5
30–39	18.6	18.9	18.7
40–64	30.0	31.2	30.6
65+	4.5	7.1	0.0
Region			
Urban	48.8	51.5	50.2
Rural	51.2	48.5	49.8
School attainment			
No school	9.5	10.6	10.0
Primary	30.8	29.9	30.3
Seconday	56.2	56.8	56.5
Higher education	3.5	2.8	3.1
Total	**100.0**	**100.0**	**100.0**

The data show that only 3% of the labour force has a higher education. More than one-half the working population (57%) has attained a secondary level education, with just over 30% has a primary education. About 10% of the working population has no education.

Figure 7.13: Labour force framework

Kiribati total population (103,058)

Working age group (15+) (65,874)

Below working age (37,184)

Total labour force (economically active) (39,034)

Total not in labour force (economically inactive) (26,840)

Employed population (27,096)

Unemployed population (11,938)

Full-time home duties (9,738)

Student (5,377)

Disabled (770)

Retired/Old age (5,110)

Inactive (5,845)

Paid workers (19,593)

Unpaid workers (7,503)

Formal employment (13,440)

Voluntary work and unpaid family work (3,493)

No work but looking for work and available to work (11,575)

Producing goods for sale (6,153)

Producing goods for own consumption, Subsistence/Village work (4,010)

Not looking for work but available to work (363)

7.6.4 Labour force participation

The labour force comprises all people aged 15 and over who, during the week prior to the census, were either employed or unemployed. Out of the total working age population aged 15 and over (65,874), the labour force accounted for about 59.3% (39,034), showing a higher male (66.8%) than female (52.3%) Labour Force Participation Rate (Fig. 7.14) in both urban and rural areas (Table 7.7 and Fig. 7.14).

Table 7.7: Labour Force Participation Rate (LFPR)

LFPRs	Kiribati	Urban	Rural
Males	66.8	65.8	67.7
Females	52.3	52.4	52.2
Total	**59.3**	**58.7**	**59.8**

Figure 7.14: Labour force participation

In addition to the contrast between men and women, and between urban and rural areas, labour force participation also varies markedly by age, being lowest among amongst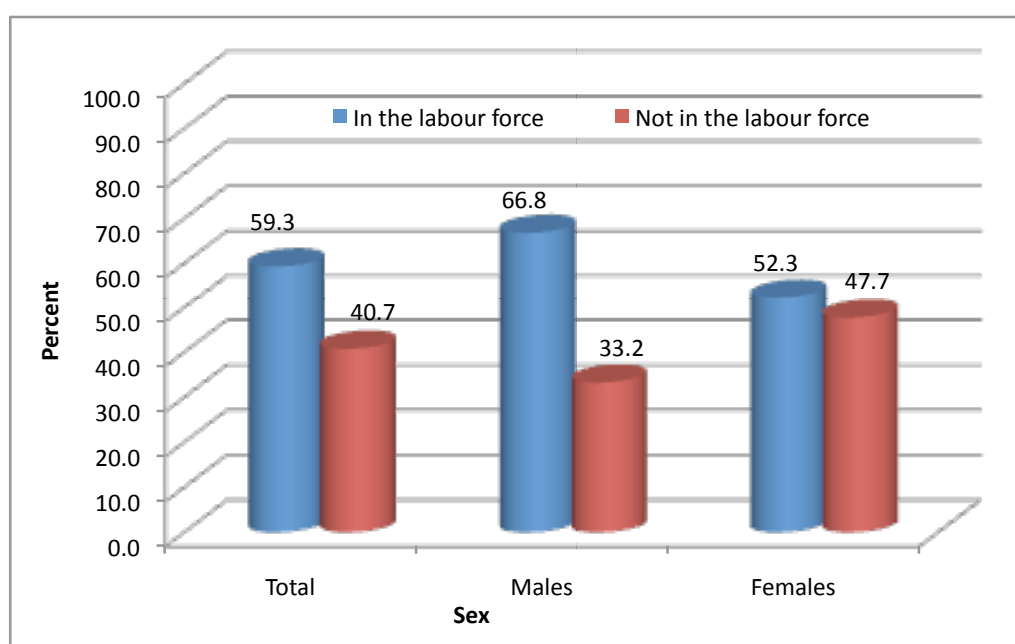 those aged 15-19 years (when many are often still in school or are undertaking other forms of training), and increases with age (Fig. 7.15). A dip around age 50 illustrates Kiribati's retirement age for civil servants. Male–female differentials noted above appear consistent throughout all age groups. Labour force participation is at its peak for men in the 30–34 age group, and reaches a peak for women in the 25–29 age group, declining gradually in subsequent years. With women in the 25–29 age group also accounting for the highest level of fertility (as noted in Chapter 3), this suggests that as families become larger, more women opt out of the labour force.

Among people not in the labour force (Fig. 7.13), people engaged in full-time home duties (e.g. home-makers, housewives) represent the largest single group, accounting for one-third (36.3%), with people not 'interested' in work (21.8%), students (20.0%), retirees (19.0%), and people not economically active due to disability (29%) making up the remainder..

Figure 7.15: Population aged 15 and over by age group, sex and Labour Force Participation Rate, Kiribati 2010
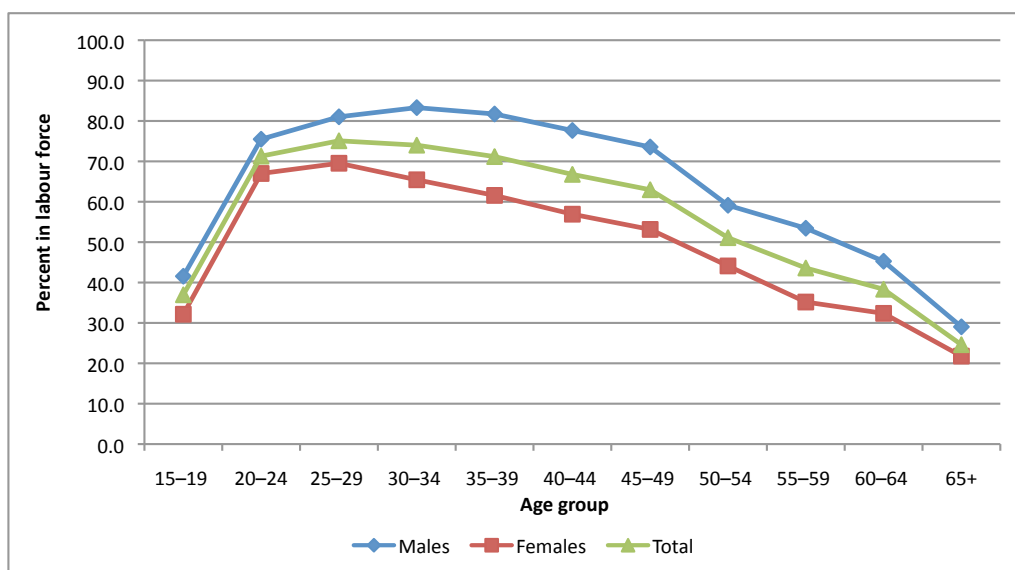
7.6.5 *Employment and unemployment*

Employment here is defined as either paid or self-employed work during a specified brief period of either one week or one day. According to the International Labour Organization (ILO), someone who is employed has:

- performed some work for wage or salary in cash or in kind;
- had a formal attachment to their job but were temporarily not at work during the reference period;
- performed some work for profit or family gain in cash or in kind; or
- were with an enterprise such as a business, farm or service but who were temporarily not at work during the reference period for any specific reason.

This definition includes everyone involved in subsistence or unpaid family or village work. ILO states that 'persons engaged in economic activities in the form of own account production of goods for own final use within the same household should be considered to be self-employed'. Unpaid village work, such as when young people receive food from the community for their endeavours, is also considered to be employment, in as far as these people performed some work for 'payment in kind'.

In Kiribati, employment refers to paid and unpaid work, with

- work for pay including employees, employers, self-employed people, and everyone producing goods for sale;
- unpaid work consisting of people who were involved in voluntary work, unpaid family or community work, or who produced goods for their own consumptions (engaged in subsistence activities).

Unemployment in Kiribati refers to people who:

- did not undertake any paid or unpaid work in the week prior to the census; but spent some time looking for work, and were available to work if a job was offered to them; and
- were not actively seeking a job but indicated their availability for work.

If a person did not work and did not spend some time looking for work, or if they looked for work but were not available for work, they were classified as 'economically inactive' (not in the labour force).

The 2010 census recorded 27,096 people as employed, which represents 69.4% of the Kiribati labour force. Of these, 56.6% were males and 43.4% were females (Table 7.8). This contrasts with 11,938 people classified as unemployed, which represents 30.6% of the labour force. Of these, 11,575 people were not working but stated that they were looking for work and expressed their availability to take work if it was offered, and 363 people who did not actively look for work but said they were available to work if work was offered. Adding to this high unemployment rate is the fact that one in four labour force participants is involved in unpaid work, and 5,845 people are considered to be 'inactive' (see next section), illustrating the difficulty of engaging in paid employment or economic activity in the Kiribati economy.

The latter becomes even more pronounced when considering the employment-population *ratio,* which refers to the number of employed people (in paid or unpaid work) relative to the total population. Looking at Kiribati's 65,784 people of working age (Fig. 7.15), only 4 out of 10 people aged 15 and over are employed, working in either paid or unpaid employment. The situation is worst in South Tarawa. This contrast can be explained by the fact that more people in rural areas are involved in subsistence and village work, which is recognised as unpaid work, than people in South Tarawa.

Table 7.8: Economic activity by sex, population aged 15 and older, Kiribati 2010

Economic activity	Males	Females	Total
1. Labour force			
1.1 Employed - paid work			
Employer	775	343	1,118
Employee	9,158	7,974	17,132
- Employee gov't (paid work)	*3,586*	*3,135*	*6,721*
- Employee private (paid work)	*2,569*	*1,689*	*4,258*
- Producing goods for sale	*3,003*	*3,150*	*6,153*
Self-employed	829	514	1,343
Total employed - paid work	***10,762***	***8,831***	***19,593***
1.2 Employed - unpaid work			
Voluntary work	355	223	578
Unpaid family work	1,887	1,028	2,915
Subsistence - Village work	2,329	1,681	4,010
Total employed - unpaid work	***4,571***	***2,932***	***7,503***
Total employed	**15,333**	**11,763**	**27,096**
1.3 Unemployed	5,853	6,085	11,938
Total in the labour force	**21,186**	**17,848**	**39,034**
2. Not in the labour force			
Student	2,561	2,816	5,377
Home duties	2,771	6,967	9,738
Inactive	2,838	3,007	5,845
Retired	1,993	3,117	5,110
Disabled	384	386	770
Total not in the labour force	***10,547***	***16,293***	***26,840***
Total	**31,733**	**34,141**	**65,874**

Table 7.9: Employment–Population Ratio (EPR)

EPR	Kiribati	Urban	Rural
Males	48.3	44.4	52.0
Females	34.5	32.1	37.0
Total	**41.1**	**37.8**	**44.4**

Mirroring the earlier pattern of labour force participation, Kiribati's Employment–Population Ratio shows similar fluctuations throughout people's lives (Fig. 7.16).

Figure 7.16: Employment–Population Ratios by age group and sex, Kiribati 2010
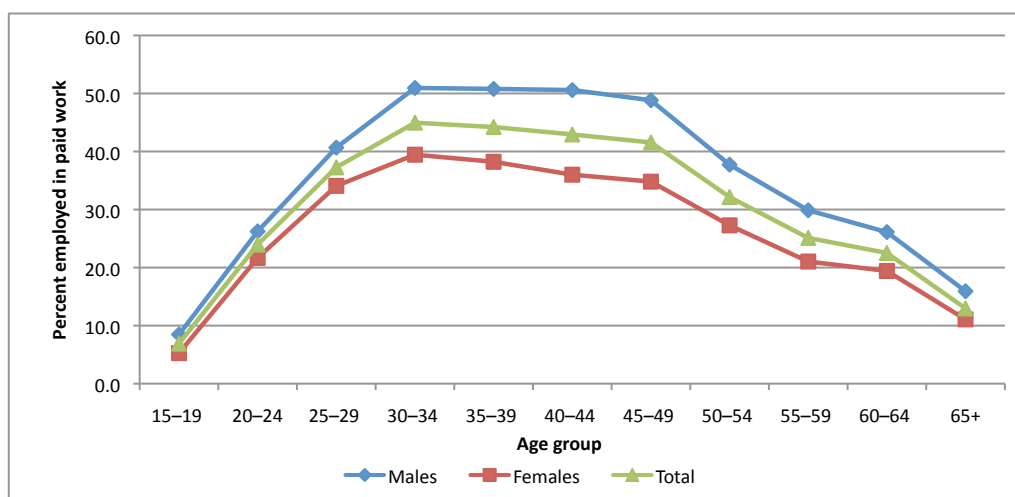
Table 7.10: Economic activity of urban and rural populations aged 15 and older, Kiribati 2010

Economic activity	Region		
	Urban	Rural	Total
1. Labour force			
1.1 Employed - paid workers			
Employer	510	608	1,118
Employee	10,143	6,989	17,132
Employee gov't	*4,443*	*2,278*	*6,721*
Employee private	*3,213*	*1,045*	*4,258*
Producing goods for sale	*2,487*	*3,666*	*6,153*
Self-employed	428	915	1,343
Total employed paid workers	11,081	8,512	19,593
1.2 Employed - unpaid workers			
Voluntary work	220	358	578
Unpaid family work	424	2,491	2,915
Subsistence - Village work	789	3,221	4,010
Total employed - unpaid workers	1,433	6,070	7,503
Total employed	**12,514**	**14,582**	**27,096**
1.3 Unemployed	**6,883**	**5,055**	**11,938**
Total in the labour force	***19,397***	***19,637***	***39,034***
2. Not in the labour force			
Student	3,883	1,494	5,377
Home duties	4,098	5,640	9,738
Inactive	2,379	3,466	5,845
Retired	2,997	2,113	5,110
Disabled	309	461	770
Total not in the labour force	***13,666***	***13,174***	***26,840***
Total	**33,063**	**32,811**	**65,874**

Summary of key employment and unemployment differentials

Tables 7.8 and Table 7.10 highlight some interesting employment patterns and differentials regarding men and women, and urban and rural Kiribati.

Paid work — There is a reasonable balance in the number of males (55%) and females (45%) in paid employment. This is particularly the case in government employment, which consists of 53% males and 47% females, and the production of goods for sale, which consists of 49% males and 51% females. The gender gap widens, however, in the private sector, which is made up of 60% males and 40% females, and in those who are employers, with more men (69%) than women (31%) employing others, or running their own business (62% males, 38% females). This gap becomes even more pronounced when considering the Employment–Population Ratio; nearly half of all I-Kiribati men of working age reported to be employed (48.3%), compared with just one in three I-Kiribati women (34.5%) — a pattern that occurs across urban and rural Kiribati.

Unpaid work — A different gender gap emerges in unpaid work, with more men (61%) than women (39%) undertaking unpaid work. This contrast occurs across all three categories of unpaid work, and is most pronounced in 'unpaid family work' (consisting of 65% males, 35% females), followed by 'voluntary work' (61% males, 39% females) and 'subsistence/village work' (58% males, 42% females).

Unemployed — Unemployment affects a larger proportion of women than men, with reported unemployment rates of 34.1% for women and 27.6% for men. Unemployment (for both men and women) is much higher in South Tarawa and Kiritimati (35.5% combined) than in rural Kiribati (25.7%). This is not surprising given Kiribati's larger formal urban economy, which prompts more people to actively look for work in town. It is worth noting, however, that one in four people in rural areas were reportedly looking for work and would have been available to take it, if it had been offered.

Unemployment impacts various age groups differently, with a country's youth (aged 15–24) usually the most affected. Kiribati is no different, featuring a youth unemployment rate of 54%; of these, 61.8% are young women and 47.6% are young men. Unemployment is a major policy challenge for Kiribati, and is illustrated in the uneven distribution of unemployment (Fig. 7.17), with young people accounting for more than one-half (51.7%) of all unemployed people.

Not in the labour force —Nearly half of all women (48%) are not in the labour force compared with one-third of all men (33%). This is largely the result of women dominating the 'home duties' category, which 36% not in the labour force. Of this group, 72% are women. Women are also more prominent across all other 'not in the labour force' categories.

The largest contrast in urban–rural differentials emerges in 'continued schooling', with over twice as many urban males and females (3,883) than rural males and females (1,494) not in the labour force because of involvement in ongoing education. This reflects the urban location of higher education and training centres. It is worth noting — given its obvious relevance to social policy — the large number (5,845) of 'inactive' men and women, who account for 22% of the population not in the labour force or for one in ten people (8.9%) of working age. The vast majority of these (3,882) explain their non-participation in the labour force in terms of 'no interest', and 'not wanting to work'. This in itself does not necessarily reflect a sense of 'disengagement', because it could also reflect people being content with what they are doing; while there appears to be no gender difference, there is a distinct contrast between rural (60%) and urban (40%) areas (Table 7.10).

Table 7.11: Economically inactive population aged 15 and over who do not wish to engage in work

	Kiribati	Urban	Rural
Males	1,884	779	1,105
Females	1,998	755	1,243
Total	**3,882**	**1,534**	**2,348**

Figure 7.17: Unemployment rate by age group and sex, Kiribati 2010
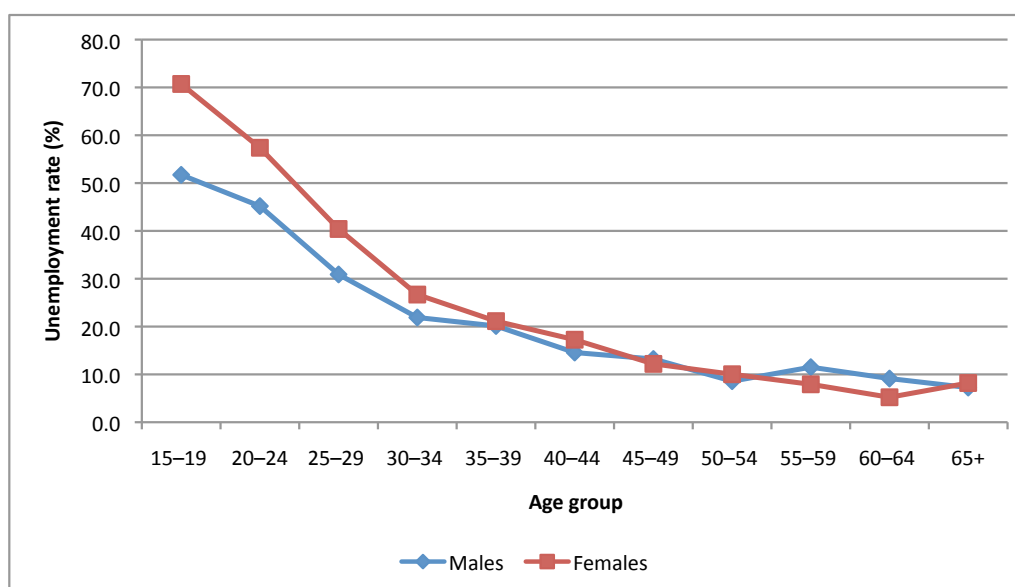
Final observation

The objective of this census report, which is to provide a summary of Kiribati's population in 2010, prevents a more detailed analysis of labour force and employment. But, given its importance in terms of social and economic development, we recommend a separate and more detailed analysis of Kiribati's labour force be undertaken, in order to provide both the government and general public with a more comprehensive picture and to facilitate development of robust social and economic policy and planning measures. The latter are of critical importance for the well-being of future generations, especially given the ongoing pressures of high population growth on urbanisation, and the combined pressure of the country's labour force being divided in near equal halves of those in paid employment (50.2%), and unpaid work (19.2%) and unemployment (30.6%).

7.6.6   Employment by work status

Employment status refers to whether someone is self employed, an employer, an employee for government or private sector, or producing goods for sale.

Figure 7.18: Employment by work status, Kiribati 2010
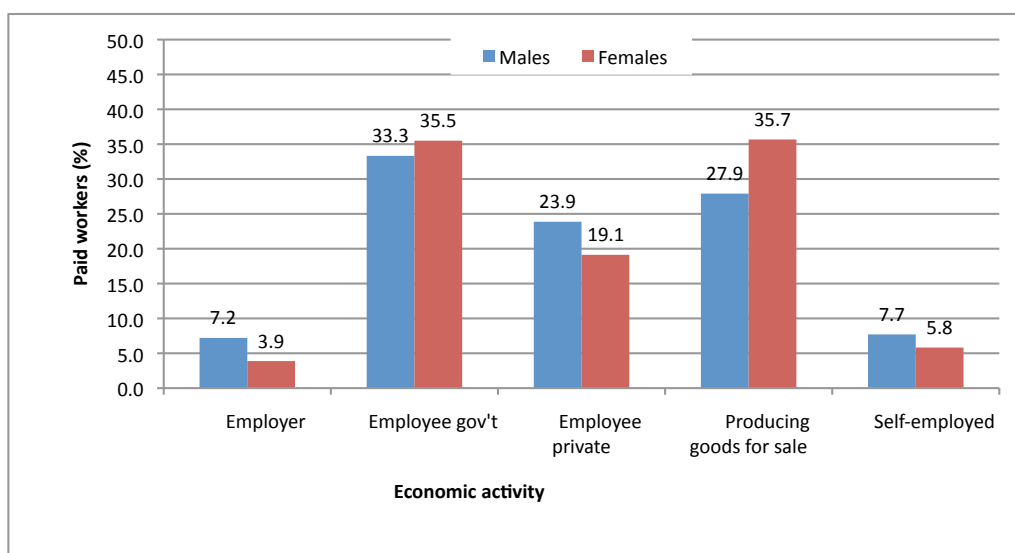
Out of the total number of paid workers, 56% were employees in both the government and private sector, followed by 31.4% who produced goods for sale, 6.9% who were self-employed, and 5.7% who were employers (Fig. 7.18 and Table 7.10). In a comparison by gender, more women than men were employed by the government, and produced goods for sale.

7.6.7   Employment by industry

Employment in an industry is defined as activity carried out by enterprises where people work. Figure 7.19 presents the results of all employed workers by their main industry and by gender.

The majority of employed paid workers were employed in the 'Wholesale, Retail Trade and Repair of Motor Vehicles' category, with 3,811 people (19.5% of the total number of employed paid workers). The 'Agriculture and Fisheries' sector was the second largest group (3,047 people, 15.6%) followed by 'Manufacturing' (2,408, 12.3%), and 'Arts Entertainment Recreational and Other Service Activities' and 'Public Administration' accounted for 11.0% The remaining industries employed less than 10% of the total paid workers.

Manufacturing activities were dominated by women while men dominated most other industries.

Figure 7.19: Employment by industry, Kiribati 2010
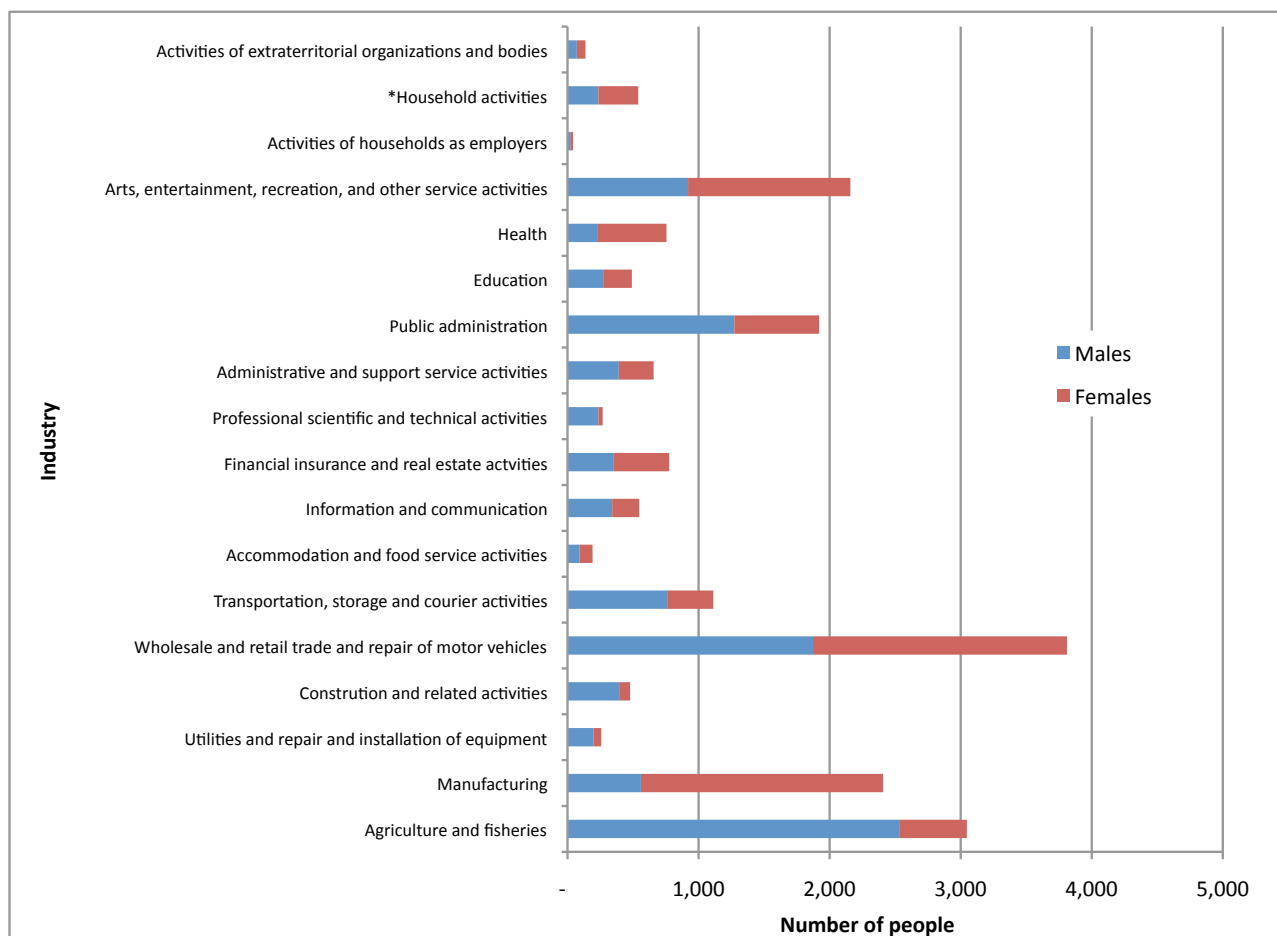
Note: * Undifferentiated goods- and services-producing activities of households for own use

7.6.8   Employment by occupation

Occupation refers to the type of work a person does at her/his place of work, and includes paid employment in government or the private sector, self-employment, being an employer, and producing goods for sale.

Figure 7.20 presents the distribution of paid workers by occupation and gender. Overall, the largest number of paid employed people was in the 'Service Workers and Shop and Market Sales' with 3,780 people (19.3%). The next significant occupational groups were 'Skilled Agriculture and Fisheries' with 3,260 people (16.6%), 'Craft and Related Workers' with 2,942 people (15.0%), 'Professionals' with 2,867 people (14.6%) and 'Elementary Occupations' with 1,970 workers or 10.1%. The remaining occupational groups had less than 10% of all paid workers.

Females outnumbered males in the occupational categories of 'Craft and Related Workers', 'Professionals', 'Elementary Occupations' and 'Clerks' (Fig. 7.20).

As for occupation by urban and rural as shown in Figure 7.21, it is evident that the majority of all employed paid workers in the rural areas were *skilled agricultural and fisheries workers*. In contrast, the majority of urban employed workers were *in service workers and shop and market sales workers.*

Figure 7.20: Employment by occupation, Kiribati 2010
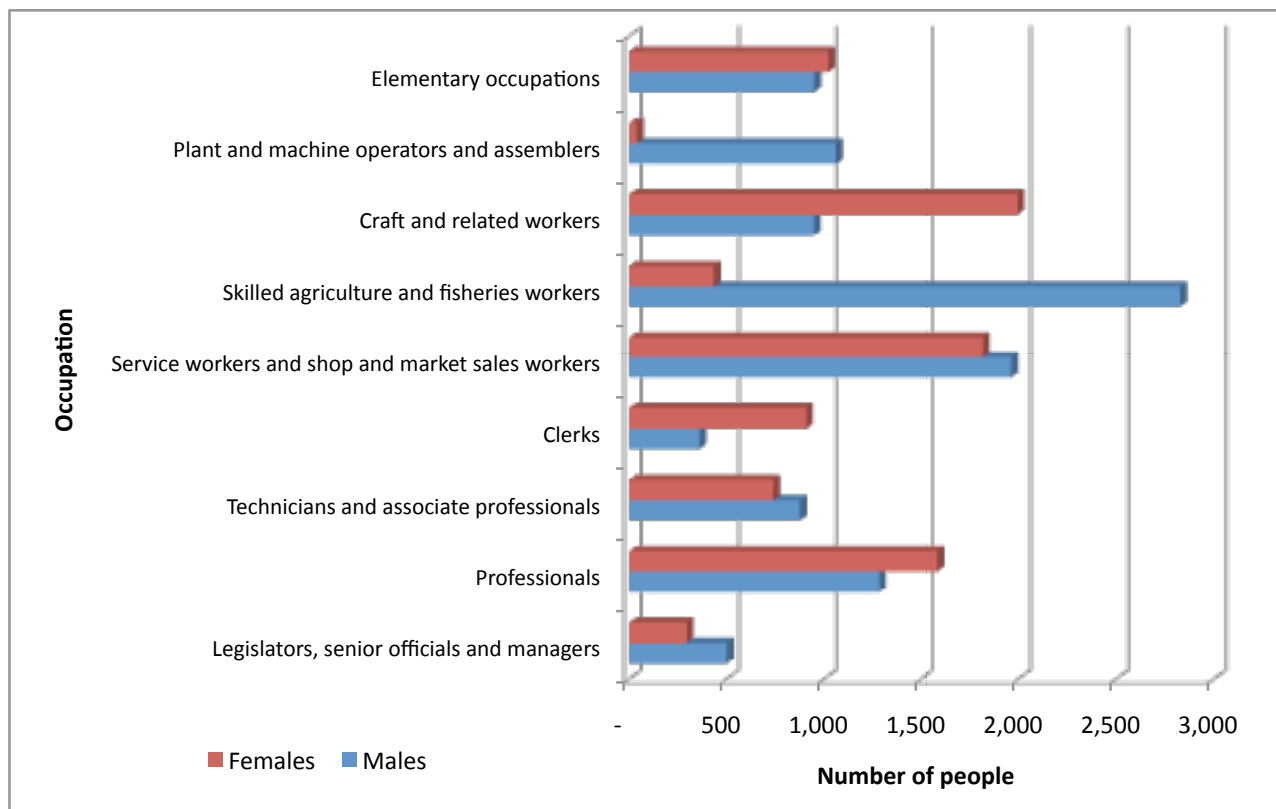
Figure 7.21: Employment occupation in urban and rural Kiribati, 2010
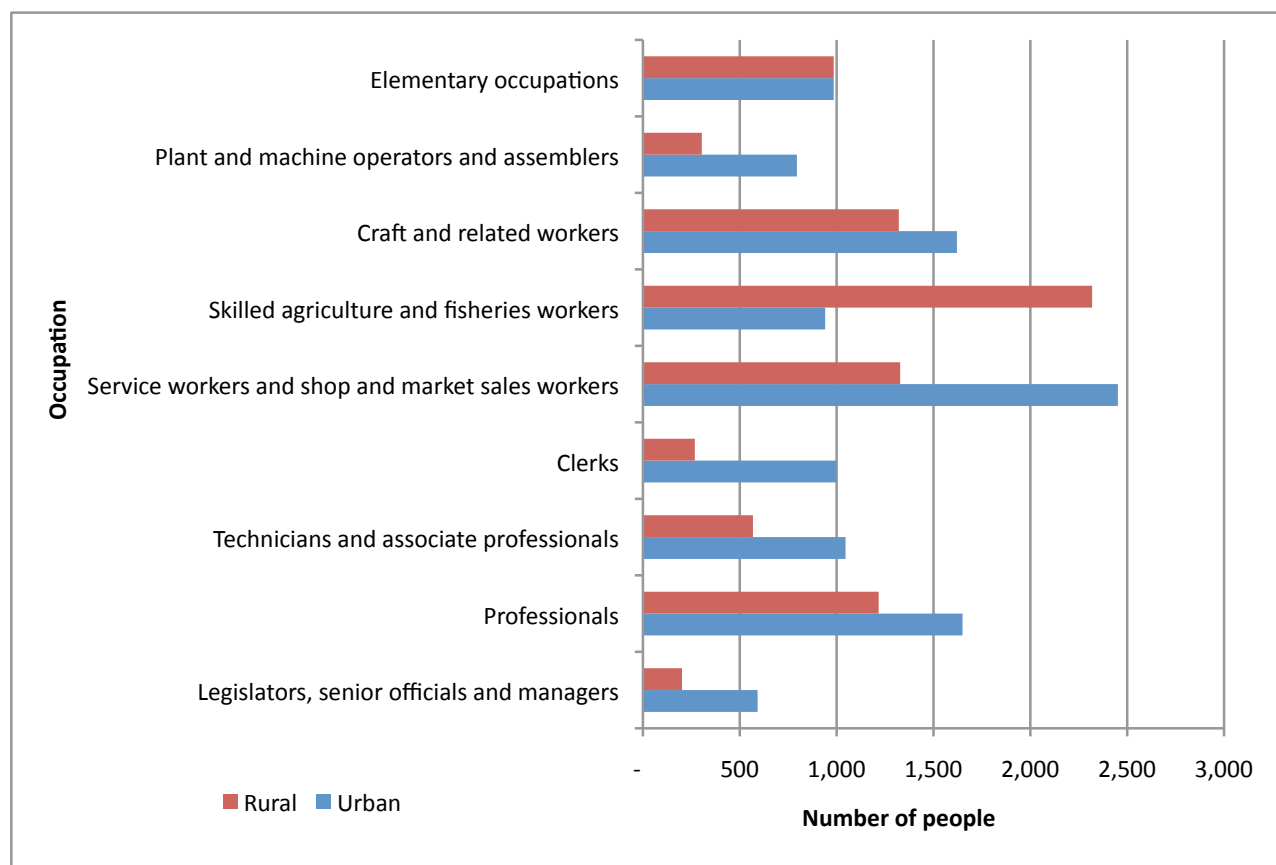
Chapter 8: Housing and household characteristics

8.1   Total number of households and household size

In a population and housing census, a household refers to a group of people who normally eat and live together. This chapter summarises the characteristics of physical dwelling units, and is followed by a description of the households within the dwelling units. In summary, the 2010 census enumerated 16,140 dwellings of which 16,043 (99.4%) were private dwellings while 97 (0.6%) were non-private dwellings or institutions.

The primary focus of this chapter's analysis is on occupied private dwelling units. There has been an increase of 2,044 dwelling units between 2005 and 2010. Most of this increase has been in South Tarawa, which has 1,460 more dwelling units. In contrast, many of the outer islands experienced a decrease in the number of dwelling units (see Table 8.1).

The 2010 census also enumerated 97 institutions such as boarding schools, hotels, hospitals, *maneaba*s and others.

Table 8.1: Number of private dwellings, occupants and average household size in Kiribati in 2000, 2005 and 2010

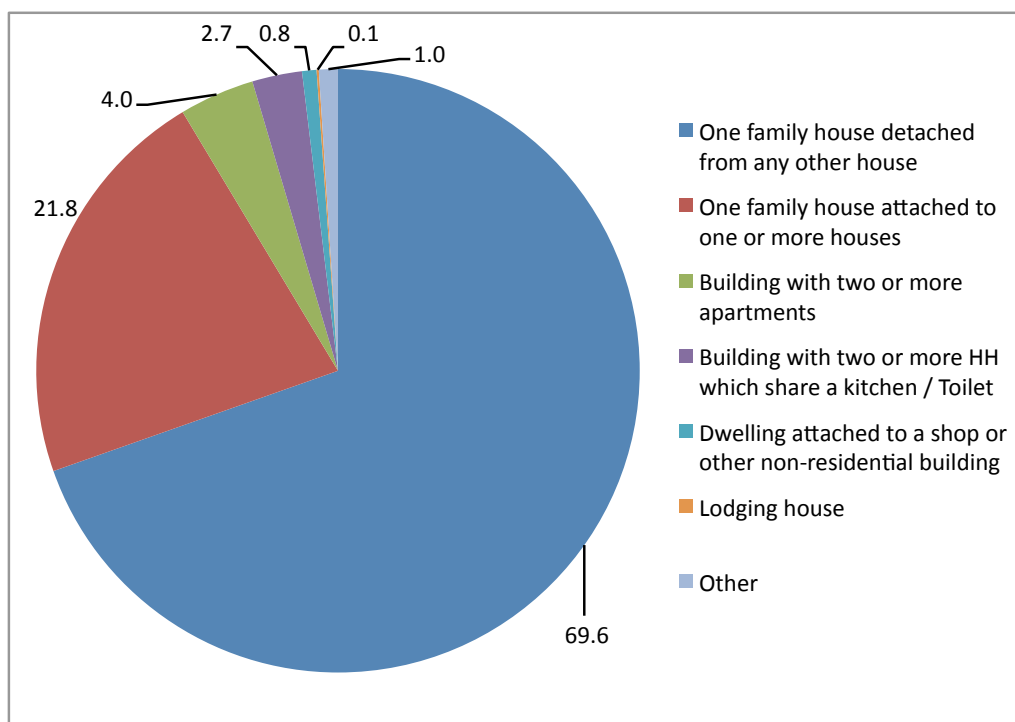| Island/Region	Number of private households			Number of people in private households			Average household size (number of people per household)		
	2000	2005	2010	2000	2005	2010	2000	2005	2010
Banaba	54	61	57	262	301	295	4.9	4.9	5.2
Makin	292	328	347	1,679	1,858	1,798	5.8	5.7	5.2
Butaritari	592	561	630	3,464	3,279	3,546	5.9	5.8	5.6
Marakei	429	437	492	2,523	2,664	2,856	5.9	6.1	5.8
Abaiang	843	853	926	5,093	5,008	5,330	6.0	5.9	5.8
North Tarawa	693	867	1,002	4,294	5,404	5,927	6.2	6.2	5.9
South Tarawa	**4,530**	**5,245**	**6,705**	**35,499**	**39,186**	**49,250**	**7.8**	**7.5**	**7.3**
Maiana	376	354	383	2,048	1,894	2,016	5.4	5.4	5.3
Abemama	533	592	583	2,753	3,059	2,826	5.2	5.2	4.8
Kuria	182	202	190	958	1,082	980	5.3	5.4	5.2
Aranuka	194	211	214	963	1,158	1,057	5.0	5.5	4.9
Nonouti	508	540	508	2,850	3,068	2,549	5.6	5.7	5.0
North Tabiteuea	600	573	682	3,214	3,332	3,573	5.4	5.8	5.2
South Tabiteuea	230	262	249	1,207	1,298	1,290	5.2	5.0	5.2
Beru	492	462	449	2,419	2,022	1,991	4.9	4.4	4.4
Nikunau	333	335	365	1,733	1,912	1,858	5.2	5.7	5.1
Onotoa	354	332	332	1,668	1,644	1,519	4.7	5.0	4.6
Tamana	214	196	202	962	875	951	4.5	4.5	4.7
Arorae	244	241	238	1,225	1,250	1,261	5.0	5.2	5.3
Teeraina	169	198	278	1,003	1,155	1,690	5.9	5.8	6.1
Tabuaeran	282	438	348	1,591	2,470	1,943	5.6	5.6	5.6
Kiritimati	458	702	857	3,386	4,684	5,423	7.4	6.7	6.3
Kanton	9	9	6	61	41	31	6.8	4.6	5.2
Total	**12,611**	**13,999**	**16,043**	**80,855**	**88,644**	**99,960**	**6.4**	**6.3**	6.2
Rural	8,081	8,754	9,338	45,356	49,458	50,710	5.6	5.6	5.4
Line&Phoenix Islands	918	1,347	1,489	6,041	8,350	9,087	6.6	6.2	6.1
Gilbert Islands	11,693	12,652	14,554	74,814	80,294	90,873	6.4	6.3	6.2

Table 8.1 also provides information on the average household size per dwelling unit in Kiribati (by islands) for the last three censuses of 2000, 2005 and 2010. In 2010, the average household size for Kiribati was 6 people, although in South Tarawa it was higher (7 people) and in rural areas it was lower (5 people). Kiribati's long history of large households has contributed to prevailing social problems, particularly in South Tarawa.

8.2   Type of private dwellings

Figure 8.1 shows the distribution of dwelling units in 2010 by type of construction. About 70% (11,167 units) of all occupied units are one-family houses that are detached from any other family house; while 22% are one-family houses attached to one or more houses. Over 2% of dwelling units were in one building that has a common kitchen and toilet facilities.

Figure 8.1: Types of dwellings, Kiribati 2010

Legend:
- One family house detached from any other house
- One family house attached to one or more houses
- Building with two or more apartments
- Building with two or more HH which share a kitchen / Toilet
- Dwelling attached to a shop or other non-residential building
- Lodging house
- Other

8.3   Housing conditions

8.3.1   Housing construction

The 2010 census collected information on the type of construction materials used in each dwelling; that is, whether the house was constructed with permanent materials (e.g. cement, bricks, aluminium roofing), local materials (e.g. coconut leaves, mangrove wood, etc) or a combination. As seen in Figure 8.2, 28.3% of occupied dwellings were constructed with permanent materials while almost half of the dwellings used local materials (e.g. coconut leaves, mangrove wood, etc) for construction. A further 21.9% used a combination of permanent and local materials.

Housing units constructed with permanent materials were more common in South Tarawa than in rural areas, where three-quarters of all private dwelling units in rural areas used local materials, while 14.4% of rural dwelling units used a combination of materials.

Figure 8.2: Dwellings by construction type, Kiribati 2010
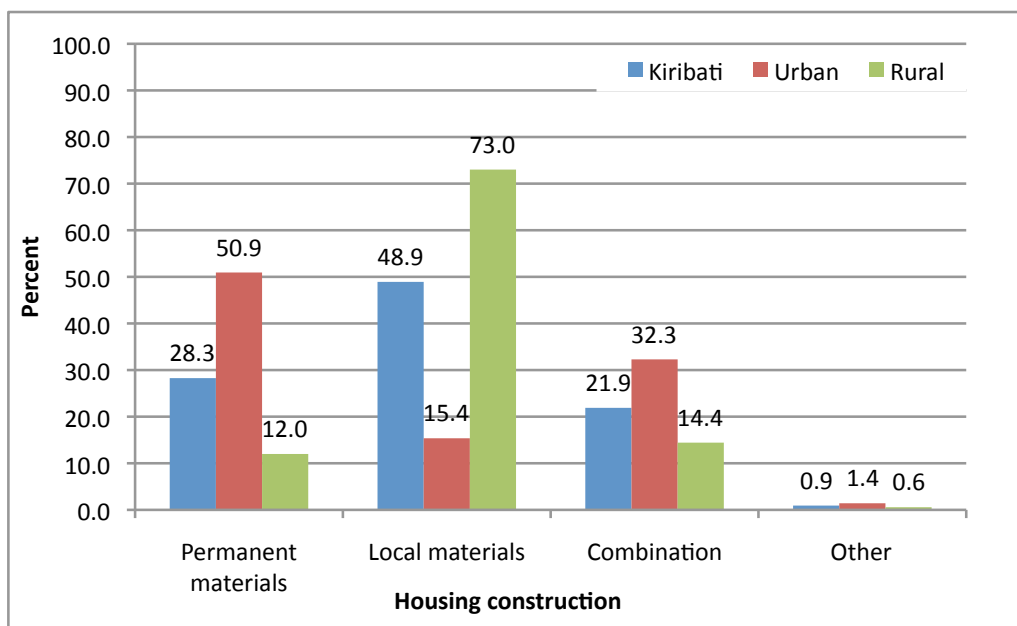
8.3.2   House ownership

Heads of households were asked about house ownership, and whether the house was government owned, privately owned, owned by the island council, or rented from other private owners.

Figure 8.3: Dwellings by ownership, Kiribati 2010
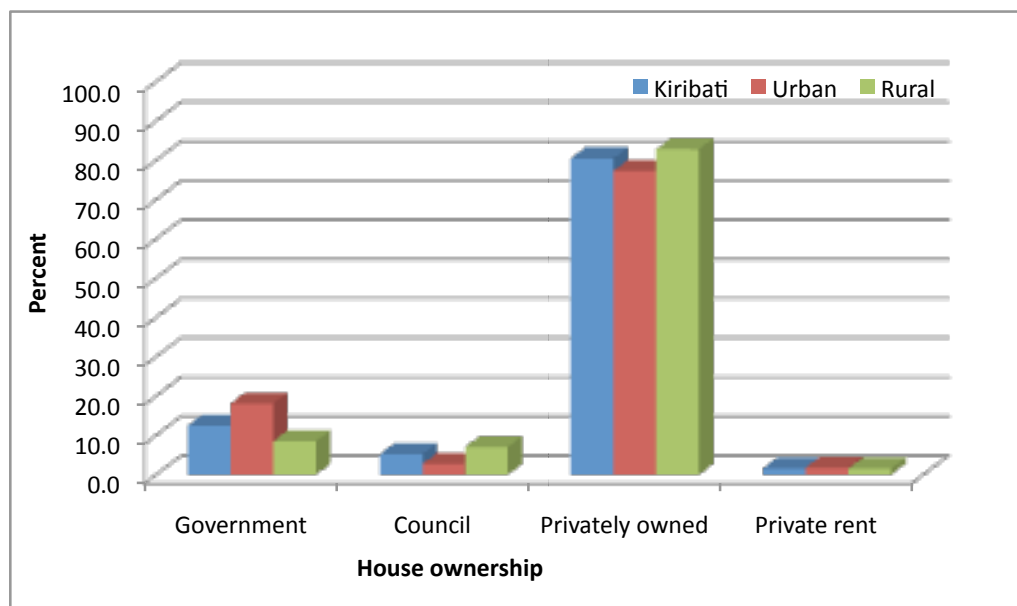
Most dwelling units (80.5%) were privately owned, meaning that the head of the household or the spouse or one of the family members owned the house. Private ownership was common in both urban areas (77.3%) and rural areas (82.9%). Government-owned houses accounted for 18% in South Tarawa where most government workers live. Private rented houses were estimated to account for only 1.7% of the total dwelling units in Kiribati in 2010.

8.3.3 Land ownership

Heads of households were asked whether the land that the house was built on was:

- owned by the head of the household, spouse or other family member;
- government leased, in which the land was owned by the government and the household occupants paid a lease to the government for a specified period;
- privately leased, where the land belonged to someone else and that the household occupants paid for the land;
- personal agreement, where the land belongs to someone else but where the occupants and land owner have some agreed on method pf payment (other than cash); or
- Other referred to households built on lands that did not belong to the households and had no other agreement or arrangement with the land owner.

As seen in Figure 8.4, more than three-fifths of all dwelling units were built on the land that belonged to the head of the household, or the spouse, or one of the household members while about one-fifth were built on government leased land. One out of ten dwelling units was built on land under private lease arrangement. The remaining 10% of dwelling units were on land where there was a personal arrangement with regard to payment or other arrangement.

Dwelling units built on a household's own land is higher in rural areas (67.6%) than in the urban area (56.8%). In contrast, housing units built on government-owned land are more common in the urban area where most land belongs to the government. A little over 5% of households in rural areas were built on land belonging to other people.

Figure 8.4: Dwelling units by ownership of land on which the main house was built, Kiribati 2010
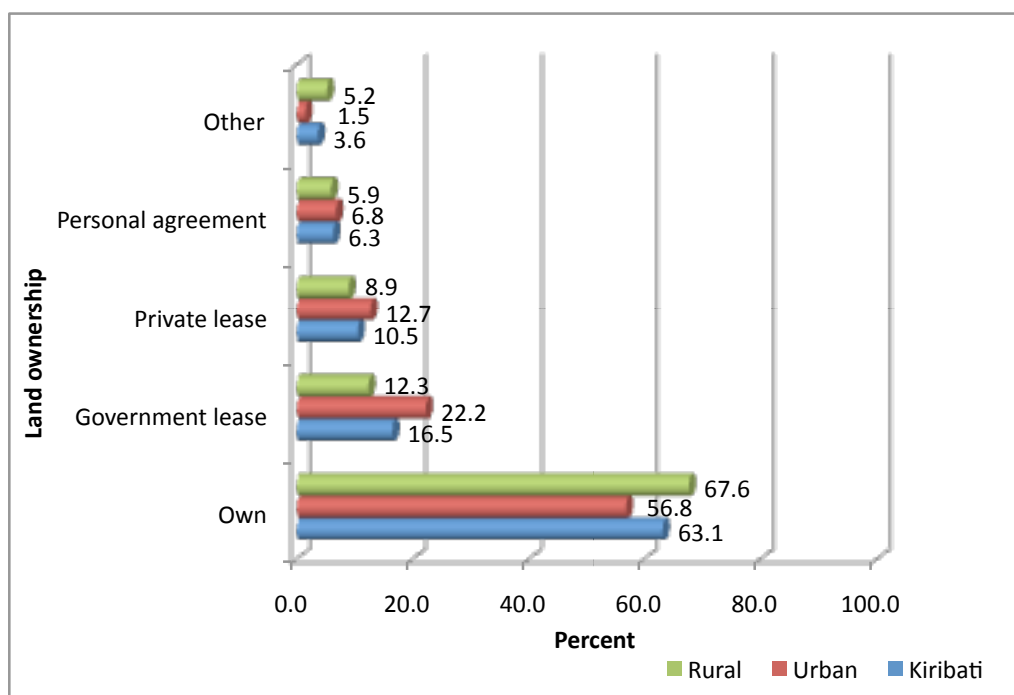
8.3.4   Age of dwelling unit
The 2010 census included questions about the age of the building. Figure 8.5 presents the year in which the dwelling units were constructed.

About 5.6% of occupied dwelling units were newly built or constructed in one year prior to the 2010 census, and these are more likely to be found in rural areas than in the urban area. One out of five dwelling units was constructed in the last ten years while a little more than 10% were constructed in the last 30 years. About 7% of all dwelling units constructed in the last 40 years are still occupied by household members.

Figure 8.5: Dwellings by age of construction, Kiribati 2010
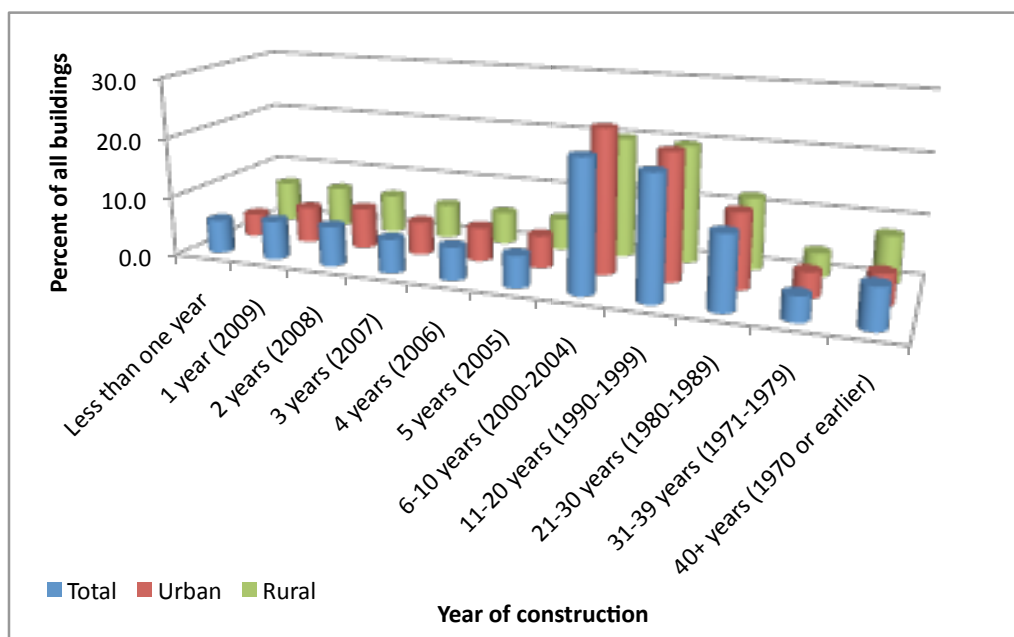
8.4   Household health and sanitation

8.4.1   Drinking water
The main source of drinking water in Kiribati was from well water (protected and open well), used in three-fifths of all dwelling units; 31.7% of dwelling units accessed drinking water from the Government Public Utilities Board (PUB) pipe system, while 6.4% of dwelling units accessed rain water for their drinking water. The most common water source for urban dwellings was the PUB pipe system (67.2% of all dwelling units) while 88.5% of rural dwellins accessed water from wells.

Safe drinking water was available to 63.8% of all dwelling units (10,236 units), which included drinking water sourced from rainwater, pipe, protected well water and bottle water.

Figure 8.6: Dwellings by source of drinking water, Kiribati 2010

- Rain water tank
- Pipe system (PUB)
- Open well water
- Protected well water
- Bottle water (shop)
- Other
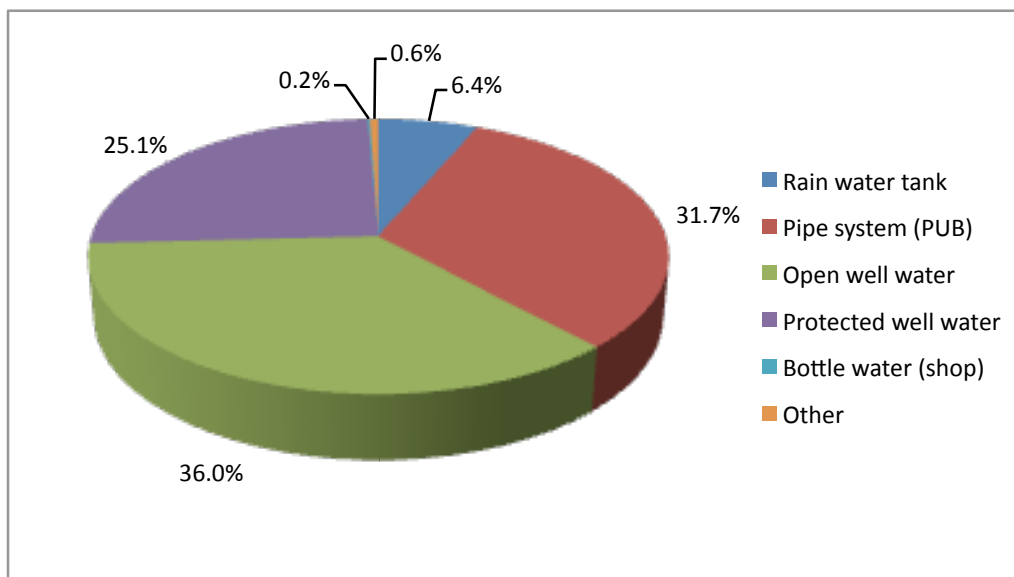
8.4.2   Toilet facility

Table 8.2 shows the percent distribution of dwelling units by type of toilet facility. About 40% (6,410) of units in Kiribati did not have any toilet facility at all, with 29.7% using the beach, 6.7% using the 'sea' and another 3.6% using the 'bush' for a toilet facility. There were 1,496 urban dwelling units (22.3%) without a toilet facility and more than half the total rural households (52.6%) did not have a toilet facility.

Improved toilet facility accessibility was reported by 48.7 percent (7,871) of the dwelling units, which includes 12.0% with a flush toilet connected to a public sanitation system and another 36.8% with a flush toilet that was connected to its own septic tank.

- The remaining dwelling units (41.3%) had access to non-improved toilet facilities such as pit latrines, atolletes/*kamkamka,* the beach, sea, bush, and other types of toilets.

Table 8.2: Types of toilet facilities by urban and rural households (%), Kiribati 2010

Toilet facility	Region		
	Urban	Rural	Kiribati
Flush toilet, public system	26.5	1.5	12.0
Flush toilet, own septic	38.9	35.3	36.8
Pit latrine	7.9	8.1	8.0
Beach	14.8	40.5	29.7
Atollete/*kamkamka**	2.6	1.8	2.1
Sea	6.2	7.0	6.7
Bush	1.3	5.2	3.6
Other	1.8	0.7	1.2
Total	**100.0**	**100.0**	**100.0**

Note: * Similar to composting toilet by which excreta and carbon-rich material are combined (vegetable wastes, straw, grass, sawdust, ash) and special conditions maintained to produce inoffensive composting smell.

8.4.3   Waste disposal

The most common method of waste disposal is a ground pit, used by 35.0% percent of dwelling units. followed by burning, reported by 21.9% of dwelling units. Both the beach and roadside point waste disposal methods were used by 14.1% of dwelling units (Table 8.3).

The most commonly used methods of waste disposal by rural households were ground pit (used by (37.9% of dwelling units) and burning (32.5% used by dwelling units). In South Tarawa, roadside point waste and ground pit were the most common methods.

Disposing waste in the sea was reported by 5.2% of all dwelling units: 6.4% of urban dwelling units and 4.4% of rural dwelling units.

Table 8.3: Method of waste disposal by urban and rural households (%), Kiribati 2010

Method of waste disposal	Urban	Rural	Kiribati
Ground pit	30.8	37.9	34.9
Burn	7.1	32.5	21.9
Beach	10.0	17.0	14.1
Road side point	30.1	2.4	14.0
Community pile point	12.1	2.0	6.2
Sea	6.4	4.4	5.2
Other places	3.7	3.8	3.8
Total	**100.0**	**100.0**	**100.0**

8.5   Household amenities

Wood and coconut shells were the main source of cooking fuel in Kiribati (used by 68.2% of dwelling units), followed by kerosene (used by 28.6% of dwelling units). The remaining dwelling units used other cooking fuel such as gas propane, electricity, copra mill residue, and others (Table 8.4).

Kerosene fuel use was highest in South Tarawa (59.6), followed by wood and coconut shells. In contrast, almost all rural households (93.0%) used wood and coconut shells as the main cooking fuels.

The 2010 census data indicated that very few households had access to clean cooking fuel, with only 0.1% of dwelling units using electricity and 2.5% using gas propane.

Table 8.4: Types of cooking fuel used by urban and rural households (%), Kiribati 2010

Type of fuel used	Urban	Rural	Kiribati
Fuel for Cooking			
Copra mill residue	1.2	0.0	0.5
Kerosene	59.6	6.3	28.6
Wood / Coconut shells	33.5	93.0	68.2
Gas	5.4	0.4	2.5
Other	0.1	0.1	0.1
Electricity	0.2	0.1	0.1
Fuel for Lighting			
Solar	0.9	28.7	17.1
Public Utility Board electricity	88.7	10.5	43.2
Kerosene	8.7	53.0	34.5
Own generator	0.2	4.8	2.9
Other	1.6	2.9	2.4
Total	**100.0**	**100.0**	**100.0**

Overall, electricity was the main means of lightning in Kiribati, used by 43.2% of dwelling units and more commonly used by urban households (88.7%) than rural households (11.3%).

The second main source of lightning was kerosene, accounting for 34.5% of dwelling units. Kerosene was more popular in rural areas (53.0%) than in the urban area (8.7%).

Solar power was available to 17.1% of dwelling units, with more dwelling units in rural areas it (28.7%) than the urban area (1%).

8.6   Ownership of capital goods and items

8.6.1   Transport and communication

Figure 8.7 shows that bicycles and motorbikes were owned by residents in 34.9% and 21.2% of dwelling units, respectively. By region, these were more commonly owned by members in rural dwelling units than urban dwelling units.

In terms of ownership of communication items, more than two-fifths of all dwelling units owned a radio and three in ten households owned a mobile phone. A computer and television were owned by the same proportion of dwelling units (more than 11%). A landline phones were used in 8.4% of dwelling units, while the Internet and citizen band (CB) radio were accessible by less than 5% of dwelling units.

Figure 8.7: Ownership of transport and communication assets, Kiribati 2010
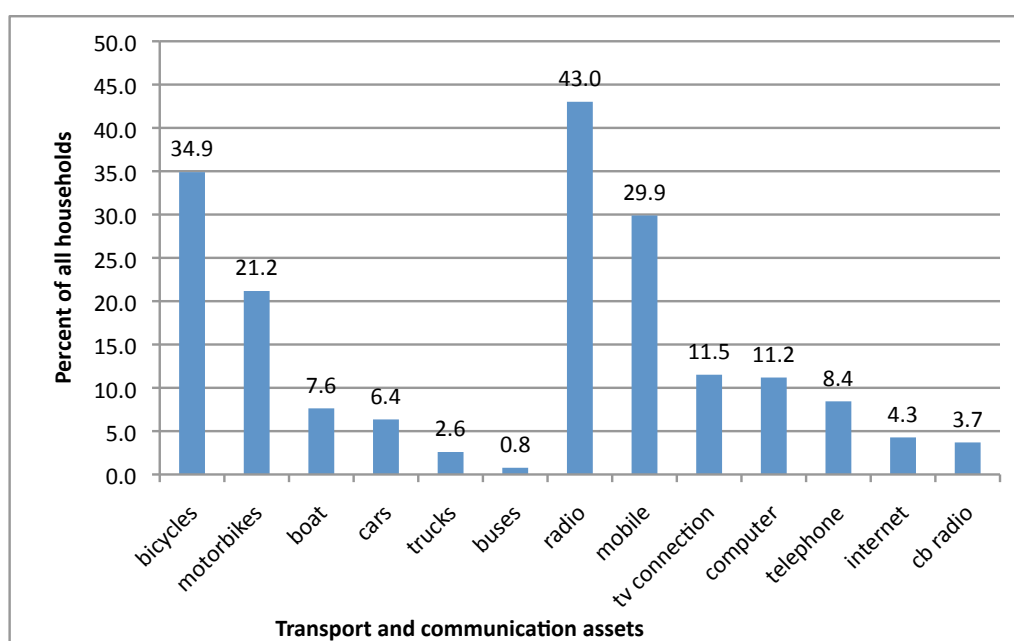
8.6.2   Other capital goods

Figure 8.8 shows the type of capital goods owned by households. A deck was the most popular capital good in Kiribati, owned by 41.5% of dwelling units; followed by a refrigerator or freezer, owned by 22.4% of dwelling units. A propane gas stove, generator and manual water pump were owned by 10% of dwelling units. A cassette player and electric water pump were owned by less than 10% of dwelling units.

Not surprisingly, appliances were more likely to be owned by urban than rural residents, with the exception of manual water pumps and generators, which were more likely to be used by rural residents.

Figure 8.8: Percent of dwellings that own other capital goods, Kiribati 2010
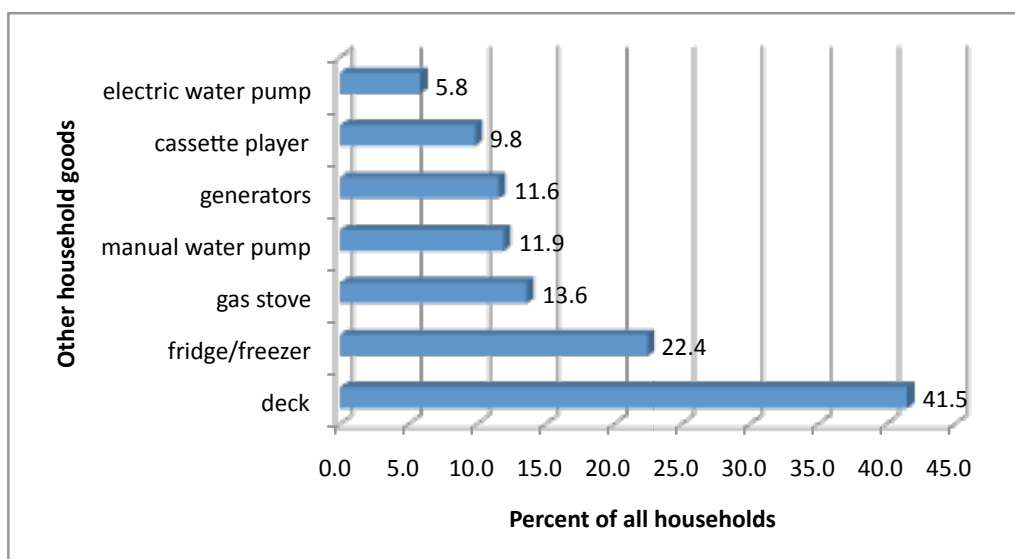
8.7   Private households involved in agricultural and fisheries activities

Based on questions asked about the types of agricultural food crops grown by household members, the data show that more than-three quarters of household members (78.5%) grew coconut trees, 60.3% grew pawpaw, 54.3% grew *te kaina* (pandanas trees), 54.3% grew 'short coconut trees locally known as "dwarf coconut trees', and 56.6% were engaged in tapping palms to make toddy (an alcoholic drink) (Fig. 8.9).

Rural households are more likely to grow food crops than urban households who typically only grow pawpaw and breadfruit.

Figure 8.9: Proportion of food crops grown by all households, Kiribati 2010
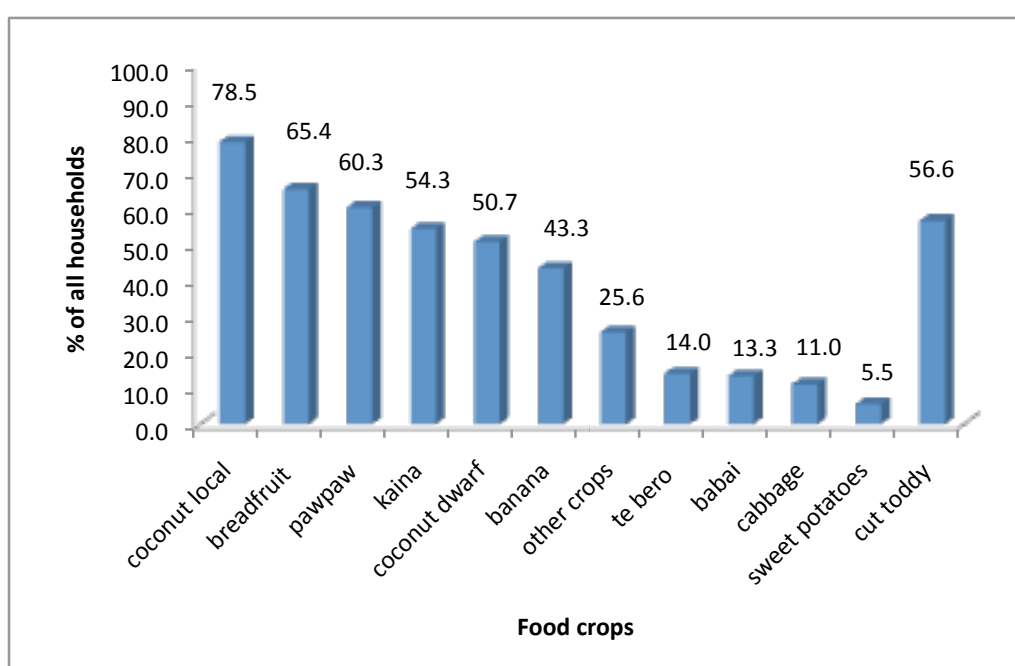
Figure 8.10 presents the proportion of dwellings (by region) whose household members were involved in fishing activities. Overall, more than half of all dwelling units had household members who were engaged in fishing (i.e. collecting in the lagoon or on the reef, lagoon fishing and reef fishing). Less than 40% of dwelling units had household members who were engaged in fish collection from the ocean and in ocean fishing. Rural household members are more likely to be engaged in fishing activities than urban household members.

Figure 8.10: Proportion of households by fishing activity, Kiribati 2010

	collection (lagoon & reef)	collection ocean	lagoon fishing	ocean fishing	reef fishing
Total	58.8	35.3	55.8	31.6	54.5
Rural	59.3	39.4	63.0	37.3	62.3
Urban	58.1	29.5	45.7	23.6	43.6

Method and place of fishing
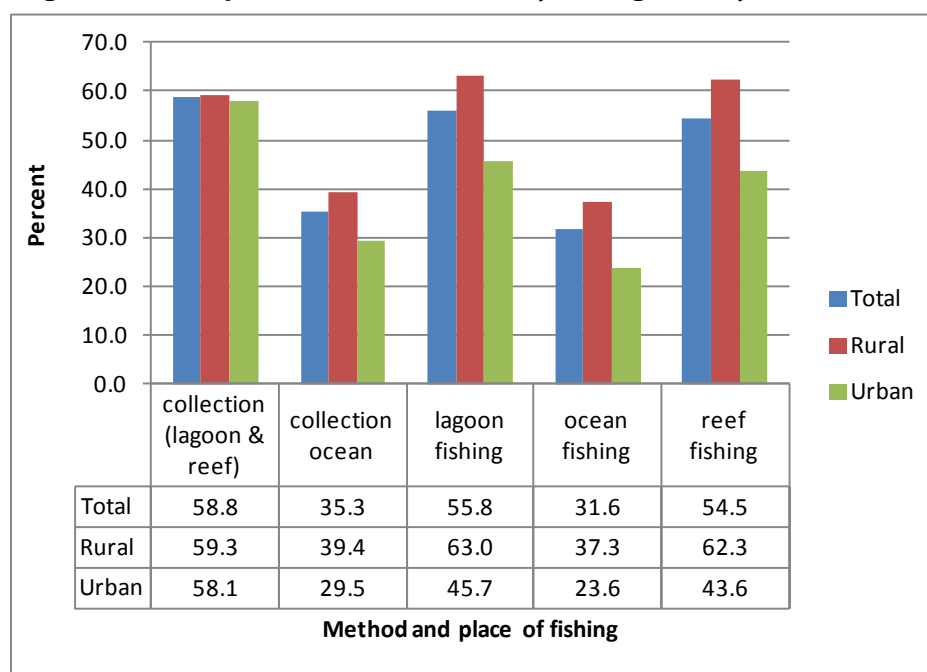
8.8   Household income

Heads of households were asked about the main source of income for their household. Table 8.5 presents the percent distribution of dwelling units by main income source of household members. The data indicate that 50.2% of dwelling units had household members receiving income from wages, followed by 39.5% of dwellings whose members were receiving income from the sale of fish, crops and other items.

About 72% of urban households received income from wages, compared with 35% of rural households. While urban households are more likely to receive income from wages, rural households are more likely to receive income from the sale of fish and crops (49%) than urban households (26%). Urban households are more likely to receive income from own business (27%) than rural households (8%) (Table 8.5).

Table 8.5: Distribution of urban and rural dwelling units by source of cash income, Kiribati 2010

Cash income source	Urban	Rural	Kiribati
Wages	71.7	34.8	**50.2**
Rental property	3.5	0.9	**2.0**
Seaman's remittances	17.9	9.1	**12.8**
Land rent	15.9	13.7	**14.6**
Sale of fish, crops	25.9	49.2	**39.5**
Other remittances	16.1	19.8	**18.3**
Own business	26.6	8.3	**15.9**

Appendix 1: Arriaga method for estimating Age-Specific Fertiltiy Rates (ASFR) for two points in time and age patterns of fertility (Ariaga-Brass)*

First enumeration: 2005

Fertility pattern is tabulated by age of woman at enumeration

November 2005 to November 2006

Age group of woman	Children ever born	Age-Specific Fertility Pattern (A.S.F.R)	Fertility consistent with C.E.B (A.S.F.R)	Fertility pattern by age at survey date	Fertility pattern by age at birth of child	Cumulation of			Age Specific Fertility Rates based on adjustment factor for the age group		
						A.S.F.R.	Fertility pattern by age at birth	Adjustment factors	20–25	25–30	30–35
				Recorded	Calculated						
15–20	0.070	0.031	0.057	0.031	0.039	0.057	0.039	1.456	0.046	0.046	0.046
20–25	0.640	0.147	0.173	0.147	0.156	0.229	0.195	1.176	0.184	0.185	0.184
25–30	1.580	0.171	0.206	0.171	0.172	0.436	0.367	1.188	0.202	0.204	0.203
30–35	2.650	0.163	0.202	0.163	0.159	0.638	0.526	1.213	0.187	0.189	0.188
35–40	3.580	0.110	0.108	0.110	0.104	0.746	0.630	1.184	0.122	0.124	0.123
40–45	4.110	0.049	0.051	0.049	0.043	0.797	0.673	1.184	0.051	0.052	0.051
45–50	4.490	0.008	0.019	0.008	0.006	0.816	0.679	1.202	0.007	0.007	0.007
Total Fertility Rate			4.1		3.4				4.0	4.0	4.0

Last enumeration: November 2010

Fertility pattern is tabulated by age of woman at enumeration

November 2009 to November 2010

Age group of woman	Children ever born	Age-Specific Fertility Pattern (A.S.F.R)	Fertility consistent with C.E.B (A.S.F.R)	Fertility pattern by age at survey date	Fertility pattern by age at birth of child	Cumulation of			Age Specific Fertility Rates based on adjustment factor for the age group		
						A.S.F.R.	Fertility pattern by age at birth	Adjustment factors	20–25	25–30	30–35
				Recorded	Calculated						
15–20	0.088	0.038	0.064	0.038	0.047	0.064	0.047	1.346	0.051	0.051	0.051
20–25	0.681	0.161	0.169	0.161	0.171	0.233	0.218	1.065	0.182	0.182	0.182
25–30	1.594	0.193	0.205	0.193	0.193	0.438	0.411	1.065	0.205	0.205	0.205
30–35	2.628	0.170	0.183	0.170	0.165	0.621	0.576	1.076	0.176	0.176	0.176
35–40	3.385	0.118	0.094	0.118	0.111	0.715	0.687	1.040	0.118	0.118	0.118
40–45	4.035	0.043	0.060	0.043	0.037	0.775	0.725	1.070	0.040	0.040	0.040
45–50	4.265	0.007	0.022	0.007	0.005	0.797	0.729	1.093	0.005	0.005	0.005
Total Fertility Rate			4.0		3.6				3.9	3.9	3.9

* MORTPAK 4.1, procedure FERTPF, United Nations
Note: CEB = children ever born

Appendix 2: Fertility estimates based on the Ariaga method*

Year and Item or age	ASFR from CEB		ASFR pattern		Adjusting factor	Adjusted ASFR's based on age group			
	ASFR	Cumula-tive	ASFR	Cumula-tive		20–29	25–29	25–34	30–34
2005 Census									
ASFR pattern corrected for one-half year period between birth and reporting									
15–19	0.0569	0.0569	0.0381	0.0381	1.4929	0.0452	0.0453	0.0458	0.0462
20–24	0.1726	0.2294	0.1557	0.1938	1.1837	0.1848	0.1853	0.1871	0.1890
25–29	0.2063	0.4358	0.1724	0.3662	1.1898	0.2046	0.2051	0.2072	0.2092
30–34	0.2018	0.6376	0.1593	0.5255	1.2132	0.1890	0.1895	0.1914	0.1933
35–39	0.1083	0.7459	0.1042	0.6298	1.1843	0.1237	0.1240	0.1252	0.1265
40–44	0.0509	0.7967	0.0434	0.6732	1.1835	0.0515	0.0517	0.0522	0.0527
45–49	0.0173	0.8141	0.0062	0.6794	1.1983	0.0073	0.0074	0.0074	0.0075
TFR	**4.07**		**3.40**			**4.03**	**4.04**	**4.08**	**4.12**
Mean age			**29.64**						
2010 Census									
ASFR pattern corrected for one–half year period between birth and reporting									
15–19	0.0639	0.0639	0.0468	0.0468	1.3655	0.0500	0.0499	0.0501	0.0504
20–24	0.1688	0.2327	0.1708	0.2175	1.0697	0.1824	0.1821	0.1830	0.1839
25–29	0.2051	0.4378	0.1930	0.4105	1.0665	0.2061	0.2058	0.2068	0.2077
30–34	0.1827	0.6205	0.1659	0.5764	1.0766	0.1772	0.1769	0.1777	0.1786
35–39	0.0943	0.7148	0.1106	0.6870	1.0405	0.1181	0.1179	0.1185	0.1191
40–44	0.0547	0.7695	0.0376	0.7246	1.0620	0.0402	0.0401	0.0403	0.0405
45–49	0.0168	0.7863	0.0048	0.7294	1.0780	0.0052	0.0051	0.0052	0.0052
TFR	**3.93**		**3.65**			**3.90**	**3.89**	**3.91**	**3.93**
Mean age			**29.25**						

*PAS spreadsheet procedure ARFE-2, US CENSUS Bureau

Note: TFR = Total Fertility Rate; ASFR = Age-Specific Fertility Rate

Appendix 3: Child mortality indices based on number of children ever born and still alive, for males*, Kiribati 2010

Age group of women	United Nations Models						Coale-Demeny Model				
	Reference	(Palloni-Heligman Equations)					Reference	(Trussell Equations)			
Infant mortality rate	Date	Latin Am.	Chilean	So. Asian	Far East	General	Date	West	North	East	South
15–20	Oct 2009	0.041	0.045	0.041	0.041	0.041	Dec 2009	0.044	0.043	0.044	0.042
20–25	Sep 2008	0.049	0.055	0.05	0.05	0.05	Sep 2008	0.051	0.047	0.053	0.052
25–30	Mar 2007	0.05	0.058	0.051	0.051	0.051	Dec 2006	0.051	0.046	0.055	0.055
30–35	Feb 2005	0.056	0.066	0.057	0.057	0.057	Oct 2004	0.057	0.05	0.062	0.061
35–40	Sep 2002	0.053	0.064	0.056	0.055	0.055	Apr 2002	0.053	0.047	0.06	0.061
40–45	Nov 1999	0.062	0.078	0.066	0.063	0.064	Aug 1999	0.063	0.054	0.071	0.071
45–50	Jul 1996	0.069	0.086	0.074	0.068	0.07	Aug 1996	0.067	0.057	0.078	0.077
Probability of dying between ages 1 and 5											
15–20	Oct 2009	0.014	0.006	0.013	0.012	0.012	Dec 2009	0.014	0.021	0.008	0.006
20–25	Sep 2008	0.019	0.009	0.017	0.016	0.017	Sep 2008	0.017	0.023	0.011	0.011
25–30	Mar 2007	0.02	0.009	0.018	0.017	0.018	Dec 2006	0.018	0.023	0.012	0.012
30–35	Feb 2005	0.024	0.012	0.022	0.021	0.021	Oct 2004	0.021	0.026	0.015	0.017
35–40	Sep 2002	0.022	0.011	0.021	0.019	0.02	Apr 2002	0.019	0.023	0.014	0.016
40–45	Nov 1999	0.028	0.016	0.029	0.025	0.026	Aug 1999	0.024	0.029	0.019	0.023
45–50	Jul 1996	0.034	0.019	0.034	0.027	0.03	Aug 1996	0.027	0.031	0.021	0.028

*= using procedure CEBCS of MORTPAK 4.1

Appendix 4: Child mortality indices based on number of children ever born and still alive, for females*, Kiribati 2010

Age group of women	United Nations Models						Coale-Demeny Model				
	Reference	(Palloni-Heligman Equations)					Reference	(Trussell Equations)			
Infant mortality rate	Date	Latin Am.	Chilean	So. Asian	Far East	General	Date	West	North	East	South
15–20	Oct 2009	0.078	0.086	0.078	0.078	0.078	Nov 2009	0.082	0.081	0.083	0.078
20–25	Sep 2008	0.039	0.043	0.039	0.039	0.039	Sep 2008	0.04	0.037	0.042	0.041
25–30	Feb 2007	0.048	0.055	0.049	0.049	0.049	Nov 2006	0.049	0.044	0.053	0.052
30–35	Feb 2005	0.044	0.052	0.046	0.045	0.045	Sep 2004	0.045	0.04	0.049	0.05
35–40	Sep 2002	0.046	0.054	0.047	0.046	0.047	Apr 2002	0.045	0.041	0.051	0.052
40–45	Dec 1999	0.054	0.067	0.058	0.055	0.056	Aug 1999	0.054	0.047	0.062	0.063
45–50	Jul 1996	0.054	0.068	0.058	0.054	0.056	Aug 1996	0.052	0.045	0.061	0.063
Probability of dying between ages 1 and 5											
15–20	Oct 2009	0.042	0.019	0.037	0.035	0.036	Nov 2009	0.037	0.053	0.024	0.029
20–25	Sep 2008	0.013	0.006	0.012	0.011	0.011	Sep 2008	0.012	0.016	0.007	0.006
25–30	Feb 2007	0.018	0.009	0.017	0.016	0.016	Nov 2006	0.016	0.021	0.011	0.011
30–35	Feb 2005	0.016	0.008	0.015	0.014	0.014	Sep 2004	0.014	0.018	0.01	0.01
35–40	Sep 2002	0.017	0.009	0.016	0.015	0.015	Apr 2002	0.014	0.018	0.01	0.012
40–45	Dec 1999	0.023	0.012	0.023	0.02	0.02	Aug 1999	0.019	0.023	0.014	0.017
45–50	Jul 1996	0.023	0.013	0.023	0.019	0.02	Aug 1996	0.018	0.021	0.014	0.018

*= using procedure CEBCS of MORTPAK 4.1