2007 Fiji Census of Population and Housing

Analytical Report

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FIJI BUREAU OF STATISTICS
SUVA, FIJI

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2007 FIJI CENSUS OF POPULATION AND HOUSING

ANALYTICAL REPORT

PREFACE AND ACKNOWLEDGEMENTS

The Population and Housing Census is conducted once every 10 years and provides benchmark data that serves as a key reference for population and housing related statistics in subsequent years. Given that it is conducted at great cost and covers all households and institutions in the country, it is an invaluable data source for a good number of users. It is important therefore that we maximize the use of data collected during the exercise. This is exactly what has been attempted in this Analytical Report.

The conduct of such a huge national exercise also contributes to Staff development. The report was prepared under the guidance of renowned Demographer, Dr. Martin Bakker. It brings out a lot of detailed information on the following demographic processes; Births, Deaths and Internal Migration in addition to the Housing Particulars of Fiji's population. I commend the effort and commitment of Dr. Bakker and his core team of Mr. Jone Fifita (Acting Principal Statistician), Ms. Maria Musudroka (Research Officer), Ms. Sereima Rokobuli (Research Officer), Ms. Salanieta Tubuduadua (Assistant Statistician) and Ms. Belinda Seruilumi (Secretary). The data processing work of Mr. Serevi Baledrokadroka (Acting Deputy Government Statistician) is greatly acknowledged with special praise for his ability to generate the very complex tables required for this report. The training component of the Census Analysis work was very useful given that some of the indirect estimation techniques used are no longer taught at training institutions so the exposure of our staff ensures that such knowledge remains at the Fiji Bureau of Statistics. Some discussions have been generated on the relevance of such techniques today given the improvements in health data. The team however, has found that current shortcomings are unlikely to be resolved in the coming decade or so. This means that the calculation of an important health indicator such as Life Expectancy at the sub national level will remain dependent on the indirect method using Census data.

The report provides users with a very detailed level of information and I urge all to fully utilize it. There is very useful information on population distribution and change, labour force, education, mortality, fertility, internal migration and urbanization and wherever possible historical data is presented for comparison purposes.

The Chapter on Labour Force would be of great interest to Human Resource Planners, with information on the employed and unemployed persons as well as the inactive population of working age. The size and structure of the country's workforce have been determined with a measurement of the labour supply and the extent to which available human resources are being utilised in the different sectors of the economy.

The Report also provides information on education. Such information is important in the design and evaluation of overall government policies which are aimed at promoting and creating employment.

The contribution of the Census Commissioner, Ratu Timoci Bainimarama, to census taking in Fiji is also acknowledged with gratitude. His initiatives have been adopted across the Pacific Region resulting in better quality data for users.

Finally, all this work will not be possible without Government's continuing support to Population Census work and for this we are truly grateful.

The Population Census operation is a huge undertaking and contributors are too numerous to list here. I take this opportunity to thank you all for your valuable input. The key to evidence based policy formulation is good data and a Population Census will remain a key source.

Epeli Waqavonovono
Government Statistician

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SUMMARY OF KEY DEMOGRAPHIC AND SOCIO-ECONOMIC INDICATORS FOR THE TOTAL POPULATION BY SEX IN 2007, 1996 AND 1986

Indicator		1986			1996			2007		
		Persons	Males	Females	Persons	Males	Females	Persons	Males	Females
Population (de-facto)	**Nr**	**715,375**	**362,568**	**352,807**	**775,077**	**393,931**	**381,146**	**837,271**	**427,160**	**410,111**
Annual rate of growth	**%**	2.0	2.0	1.9	0.8	0.8	0.8	0.7	0.7	0.7
Rate of natural increase	**%**	-	-	-	-	-	-	1.4	1.4	1.4
Doubling time	**yr**	35	-	-	86	-	-	99	-	-
Crude population density	**km²**	39	-	-	42	-	-	46	-	-
Sex Ratio		103	-	-	103	-	-	104	-	-
Myers' Index		2.6	2.8	2.4	2.3	2.3	2.4	2.8	3.4	2.3
Proportion< age 15	**%**	38.4	38.8	37.9	35.4	35.8	34.9	29.0	29.4	28.6
Proportion age 15-64	**%**	58.7	58.3	59.1	61.5	61.3	61.7	66.3	66.4	66.3
Proportion ≥ age 65	**%**	2.9	2.9	3.0	3.1	2.9	3.4	4.6	4.2	5.1
Dependency Ratio	**%**	70.4	74.8	66.7	62.6	63.2	62.1	50.8	50.6	50.8
Child-Woman Ratio	**%**	-	-	55.5	-	-	46.7	-	-	36.9
Median Age	**yr**	20.6	20.5	20.8	21.2	20.9	21.6	25.1	24.8	25.4
Proportion never married	**%**	-	35.7	26.7	-	36.1	26.8	-	38.2	28.5
Proportion married	**%**	-	61.5	63.5	-	60.8	63.0	-	57.6	60.8
Proportion widowed	**%**	-	1.6	7.4	-	1.9	8.1	-	2.9	9.0
Prop. divorced/separated	**%**	-	1.2	2.3	-	1.2	2.1	-	1.3	1.8
Mean age at Marriage	**yr**	-	25.3	22.5	-	26.1	22.9	-	27.7	24.1
Infant Mortality Rate	**‰**	22	24	20	21	21	22	20	21	19
Child Mortality Rate	**‰**	5	5	5	5	5	5	7	7	6
Av. Life Expectancy at Birth	**yr**	67.1	65.1	69.0	66.5	64.4	68.6	67.4	65.2	69.5
Av. Life Expectancy-age 25	**yr**	44.9	43.1	46.5	44.3	42.3	46.1	45.2	43.1	47.0
Av. Life Expectancy-age 65	**yr**	-	-	-	11.8	10.7	12.8	13.4	12.3	14.4
Crude Death Rate	**‰**	-	-	-	6	7	5	8	8	7
Intrinsic Death Rate	**‰**	14.9	15.4	14.5	15.0	15.5	14.5	14.8	15.3	14.4
Total Fertility Rate		3.5	-	-	2.7	-	-	2.6	-	-
Gross Reproduction Rate		1.7	-	-	1.3	-	-	1.3	-	-
Net Reproduction Rate		1.6	-	-	1.3	-	-	1.2	-	-
Crude Birth Rate	**‰**	-	-	-	20	-	-	22	-	-
Mean age Mothers-childbirth	**yr**	-	-	26.3	-	-	27.6	-	-	27.2
Mean age Fathers-childbirth	**yr**	-	29.1	-	-	30.8	-	-	30.8	-
Interprovincial Migrants.	**%**	35.0	-	-	36.5	34.0	39.1	39.4	36.6	42.4
Recent Interprov. Migrants	**%**	15.9	-	-	16.2	16.0	16.4	15.6	15.3	16.0
International Net Migr. Rate	**%**	-	-	-	-	-	-	0.7	-	-
Urban Population	**%**	38.7	-	-	46.4	-	-	50.7	-	-
In Labour Force	**Nr**	-	-	-	297,770	200,052	97,718	326,496	217,168	109,328
-Employed	**Nr**	-	-	-	286,646	194,350	92,296	298,276	202,401	95,875
.Money Income	**Nr**	-	-	-	219,314	166,299	53,015	240,908	174,599	66,309
.Subsistence only	**Nr**	-	-	-	67,332	28,051	39,281	57,368	27,802	29,566
-Unemployed	**Nr**	-	-	-	11,214	5,702	5,422	28,220	14,767	13,453
Not in Labour Force	**Nr**	-	-	-	203,143	52,670	150,473	267,660	84,350	183,310
Unemployment Rate	**%**	-	-	-	3.7	2.9	5.5	8.6	6.8	12.3
Crude LF Participation Rate	**%**	-	-	-	38.4	50.7	25.7	39.1	51.5	27.3
Attending School	**Nr**	167,980	85,614	82,366	221,174	112,747	108,427	231,050	118,999	112,051
Gross Attendance Ratio	**%**	-	-	-	106.9	107.2	106.7	108.5	109.3	107.6
Completed Degree	**Nr**	-	-	-	7,005	4,471	2,534	14,318	8,111	6,207
Adult Literacy Ratio		-	-	-	95.1	96.6	93.6	98.7	98.8	98.6
Christian	**Nr**	378,452	192,431	186,021	449,482	228,482	221,000	545,517	278,307	267,210
Hindu	**Nr**	273,088	137,813	135,275	261,097	132,578	128,519	232,103	118,514	113,589
Moslem	**Nr**	56,001	28,162	27,839	54,323	27,504	26,819	52,594	26,692	25,902
Households (in Priv. Dwellings)	**Nr**	124,098	-	-	144,239	-	-	174,117	-	-
Average Household Size		5.8	-	-	5.3	-	-	4.8	-	-

SUMMARY OF KEY DEMOGRAPHIC AND SOCIO-ECONOMIC INDICATORS FOR THE ETHNIC FIJIAN POPULATION BY SEX IN 2007, 1996 AND 1986

Indicator		1986			1996			2007		
		Persons	Males	Females	Persons	Males	Females	Persons	Males	Females
Population (de-facto)	Nr	329,305	167,256	162,049	393,575	199,895	193,680	475,739	242,469	233,270
Proportion of Total Population	%	46.0	-	-	50.8	-	-	56.8	-	-
Annual rate of growth	%	2.4	2.4	2.4	1.8	1.8	1.8	1.7	1.7	1.7
Rate of natural increase	%	-	-	-	-	-	-	1.7	-	-
Doubling time	yr	29	-	-	39	-	-	40	-	-
Sex Ratio		103	-	-	103	-	-	104	-	-
Myers' Index		2.9	2.4	3.4	1.8	1.8	1.8	3.1	3.7	2.6
Proportion< age 15	%	39.2	39.7	38.6	37.9	38.6	37.2	32.8	33.4	32.2
Proportion age 15-64	%	57.0	56.5	57.4	58.7	58.2	59.1	62.7	62.4	63.0
Proportion ≥ age 65	%	3.8	3.7	4.0	3.4	3.2	3.7	4.5	4.2	4.8
Dependency Ratio	%	74.8	76.8	74.2	70.5	71.8	69.2	59.6	60.3	58.7
Child-Woman Ratio	%	-	-	61.5	-	-	55.4	-	-	44.9
Median Age	yr	20.2	-	-	20.1	19.6	20.5	23.0	22.6	23.4
Proportion never married	%	-	39.8	30.1	-	39.4	30.1	-	41.8	32.5
Proportion married	%	-	56.8	59.9	-	57.1	60.0	-	54.2	58.0
Proportion widowed	%	-	1.9	7.4	-	2.2	7.6	-	2.9	7.9
Prop. Divorced/separated	%	-	1.4	2.7	-	1.4	2.3	-	1.1	1.6
Mean age at Marriage	yr	-	26.6	23.4	-	27.0	23.9	-	28.2	24.7
Infant Mortality Rate	‰	26	27	25	25	25	26	21	22	20
Child Mortality Rate	‰	6	7	6	6	6	6	8	7	8
Av. Life Expectancy at Birth	yr	67.0	64.9	69.0	66.5	64.8	68.1	66.3	65.2	67.4
Av. Life Expectancy-age 25	yr	45.1	43.2	46.9	44.5	42.9	46.0	44.1	43.1	45.1
Av. Life Expectancy-age 65	yr	-	-	-	12.0	11.0	12.9	12.7	12.1	13.2
Crude Death Rate	‰	-	-	-	6	7	6	6	7	5
Intrinsic Death Rate	‰	14.9	15.4	14.5	15.0	15.4	14.6	15.1	15.3	14.8
Total Fertility Rate		-	-	-	3.3	-	-	3.2	-	-
Gross Reproduction Rate		-	-	-	1.6	-	-	1.6	-	-
Net Reproduction Rate		-	-	-	1.5	-	-	1.5	-	-
Crude Birth Rate	‰	-	-	-	22	-	-	25	-	-
Mean age Mothers-childbirth	yr	-	-	-	-	-	28.5	-	-	27.8
Mean age Fathers-childbirth	yr	-	-	-	-	31.6	-	-	31.3	-
Interprovincial Migrants.	%	-	-	-	41.2	-	-	41.5	-	-
Recent Interprov. Migrants	%	-	-	-	19.5	-	-	17.3	-	-
International Net Migr. Rate	%	-	-	-	-	-	-	0.0	-	-
Proportion Urban Fijians	%	-	-	-	41.0	-	-	44.5	-	-
In Labour Force	Nr	-	-	-	156,409	96,927	59,482	178.884	113,541	65,343
-Employed	Nr	-	-	-	150,987	-	-	161,105	103,996	57,109
.Money Income	Nr	-	-	-	99,966	-	-	118,744	82,468	36,276
.Subsistence only	Nr	-	-	-	51,021	-	-	42,361	21,528	20,833
-Unemployed	Nr	-	-	-	5,422	-	-	17,779	9,545	8,234
Not in Labour Force	Nr	-	-	-	88,014	25,875	62,139	140,780	47,966	92,814
Unemployment Rate	%	-	-	-	3.5	2.9	4.5	9.9	8.4	12.6
Crude LF Participation Rate	%	-	-	-	39.7	51.9	25.2	38.4	51.6	25.4
Attending School	Nr	76,202	38,923	37,279	113,247	57,944	55,503	139,703	72,196	67,507
Gross Attendance Ratio	%	-	-	-	109.3	109.7	108.9	109.0	110.0	107.9
Completed Degree	Nr	-	-	-	1,911			4,802		
Adult Literacy Ratio		-	-	-	98.1	98.4	97.8	99.3	99.2	99.3
Christian	Nr	327,767	-	-	390,380	-	-	472,682	-	-
Hindu	Nr	699	-	-	864	-	-	1,101	-	-
Moslem	Nr	326	-	-	324	-	-	858	-	-
Households (in Priv. Dwellings)	Nr	53,000	-	-	66,782	-	-	88,826	-	-
Average Household Size		6.2	-	-	5.8	-	-	5.3	-	-

SUMMARY OF KEY DEMOGRAPHIC AND SOCIO-ECONOMIC INDICATORS FOR THE INDIAN POPULATION BY SEX IN 2007, 1996 AND 1986

Indicator		1986			1996			2007		
		Persons	Males	Females	Persons	Males	Females	Persons	Males	Females
Population (de-facto)	Nr	348,704	175,829	172,875	338,818	171,796	167,022	313,801	159,868	153,933
Proportion of Total Population	%	48.7	-	-	43.7	-	-	37.5	-	-
Annual rate of growth	%	1.8	1.8	1.8	-0.3	-0.3	-0.3	-0.7	-0.7	-0.7
Rate of natural increase	%	-	-	-	-	-	-	0.8	-	-
Doubling/Halving Time	yr	40	-	-	-241	-	-	-100	-	-
Sex Ratio		102	-	-	103	-	-	104	-	-
Myers' Index		3.0	2.7	3.4	2.9	2.8	3.1	2.6	3.2	2.1
Proportion< age 15	%	37.6	38.0	37.1	32.6	32.9	32.3	23.3	23.4	23.1
Proportion age 15-64	%	59.9	59.4	60.3	64.7	64.7	64.7	72.0	72.5	71.5
Proportion ≥ age 65	%	2.6	2.6	2.6	2.7	2.4	3.0	4.7	4.1	5.4
Dependency Ratio	%	66.7	68.4	65.8	54.6	54.6	54.6	38.9	37.9	39.9
Child-Woman Ratio	%	-	-	50.4	-	-	37.4	-	-	25.4
Median Age	yr	20.9			22.4	22.1	22.7	27.9	27.6	28.2
Proportion never married	%	-	31.9	25.5	-	32.3	22.5	-	33.3	22.4
Proportion married	%	-	66.8	68.4	-	65.2	66.9	-	62.4	64.9
Proportion widowed	%	-	0.8	4.8	-	1.6	8.8	-	2.8	10.7
Prop. divorced/separated	%	-	0.5	1.3	-	0.9	1.9	-	1.4	1.9
Mean age at Marriage	yr	-	24.3	21.6	-	25.2	21.6	-	27.0	23.0
Infant Mortality Rate	‰	19	22	16	18	18	19	21	23	19
Child Mortality Rate	‰	4	4	4	4	3	4	5	6	4
Av. Life Expectancy at Birth	yr	67.1	65.2	68.9	66.5	64.0	69.0	68.6	64.9	72.2
Av. Life Expectancy-age 25	yr	44.6	43.0	46.1	44.0	41.7	46.2	46.2	42.8	49.6
Av. Life Expectancy-age 65	yr	-	-	-	11.5	10.3	12.6	14.2	12.2	16.2
Crude Death Rate	‰	-	-	-	6	7	5	8	9	6
Intrinsic Death Rate	‰	14.9	15.3	14.5	15.0	15.6	124.5	14.6	15.4	13.9
Total Fertility Rate		-	-	-	2.2	-	-	1.9	-	-
Gross Reproduction Rate		-	-	-	1.1	-	-	0.9	-	-
Net Reproduction Rate		-	-	-	1.0	-	-	0.9	-	-
Crude Birth Rate	‰	-	-	-	17	-	-	16	-	-
Mean age Mothers-childbirth	yr	-	-	-	-	-	26.0	-	-	25.8
Mean age Fathers-childbirth	yr	-	-	-	-	29.6	-	-	29.8	-
Interprovincial Migrants.	%	-	-	-	28.6	-	-	33.9	-	-
Recent interprov. Migrants	%	-	-	-	10.5	-	-	11.7	-	-
International Net Migr. Rate	%	-	-	-	-	-	-	-1.5	-	-
Proportion Urban Indians	%		-	-	49.6	-	-	56.7	-	-
In Labour Force	Nr	-	-	--	125,200	92,767	32,433	129,045	92,028	37,017
-Employed	Nr	-	-	-	120,234	-	-	120,068	87,571	32,497
.Money Income	Nr	-	-	-	106,260	-	-	108,174	83,052	25,122
.Subsistence only	Nr	-	-	-	13,974	-	-	11,894	4,519	7,375
-Unemployed	Nr	-	-	-	4,966	-	-	8,977	4,457	4,520
Not in Labour Force	Nr	-	-	-	103,097	22,498	80,599	111,742	30,440	81,302
Unemployment Rate	%	-	-	-	4.0	2.8	7.4	7.0	4.8	12.2
Crude LF Participation Rate	%	-	-	-	37.0	49.5	26.2	41.6	50.0	28.1
Attending School	Nr	121,651	62,281	59,370	95,008	48,047	46,961	76,351	39,007	37,344
Gross Attendance Ratio	%	-	-	-	103.8	103.8	103.8	107.6	108.1	107.1
Completed Degree	Nr	-	-	-	3,225	-	-	6,658	-	-
Adult Literacy Ratio		-	-	-	91.6	94.4	88.8	97.9	98.1	97.6
Christian	Nr	15,699	-	-	20,719	-	-	30,734	-	-
Hindu	Nr	271,994	-	-	259,775	-	-	228,706	-	-
Moslem	Nr	55,442	-	-	53,753	-	-	51,031	-	-
Households (in Priv. Dwellings)	Nr	64,001	-	-	68,978	-	-	74,601	-	-
Average Household Size		5.4	-	-	4.9	-	-	4.2	-	-

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INTRODUCTION

For effective policy making and planning as well as the monitoring and evaluation of development programmes and projects, comprehensive, accurate and up to date statistical information is needed. Over the years, the demands for more and more detailed statistical information have increased dramatically. These demands do not only come from the national government but, as a result of the emphasis on small area planning, increasingly also from planners at the sub-national level. In Fiji, this is particularly the case for provincial planners. In addition, the data requirements of NGOs and institutions as well as individual researchers have also increased. This also applies to the private sector, especially in the case of business planners.

In Fiji, the Fiji Bureau of Statistics (FBoS) is the main provider of statistical information. This applies to demographic, socio-economic and most other types of data. So far, most FBoS publications mainly covered information at the national level, usually specified for the main ethnic groups (Fijians, Indians and Others) as well as for the geographic sectors (rural and urban). However, in order to facilitate small area planning, the Bureau decided that 2007 Census information will also be made available in separate reports for the 14 provinces and Rotuma District.[1] These reports at the provincial level are referred to as "Provincial Profiles" (PF).

This Analytical Report is mainly based on the analysis of data collected during the 2007 Census in Fiji. This data is available for several geographic subdivisions of the country and by geographic sector. Moreover, throughout the report, comparisons are made with the indices derived from previous censuses, especially the 1996 Census.

The Introduction of this report briefly discusses several issues with regard to census taking in Fiji in general and the 2007 Census in particular.

- Section 1 introduces a basic framework of information that ideally should be available to policy makers and planners at all levels.
- Section 2 reviews the various data collection systems that should provide this information and provides an assessment of the status of each of these systems in Fiji.
- Section 3 focuses on Fiji's principal data collection system, the national census
- Section 4 homes in on several aspects of the most recent census conducted in 2007.
- The final Section 5 provides a brief overview of the information contained in this Analytical Report.

[1] For the purposes of statistical/demographic analysis at the FBoS, Rotuma is considered as a province.

1. Basic framework of data requirements

Figure A presents an overview of the population database required for effective policy making, planning, monitoring and evaluation. It constitutes a conceptual framework of which basic demographic, socio-economic and other concepts are the elements. It also shows how the elements of the framework are interrelated.

In order to be useful for planners, all concepts of this framework need to be operationalized. In other words, they need to be translated into variables that can be measured. Moreover, effective intervention in the planning and monitoring process also requires that the nature and extent of the interrelationships between these variables is known.

The elements of the framework have been summarized into four categories viz.:

- *Population Characteristics*
- *Population Processes*
- *Determinants (or causes) of population change*
- *Consequences of population change.*

1.1. Population characteristics

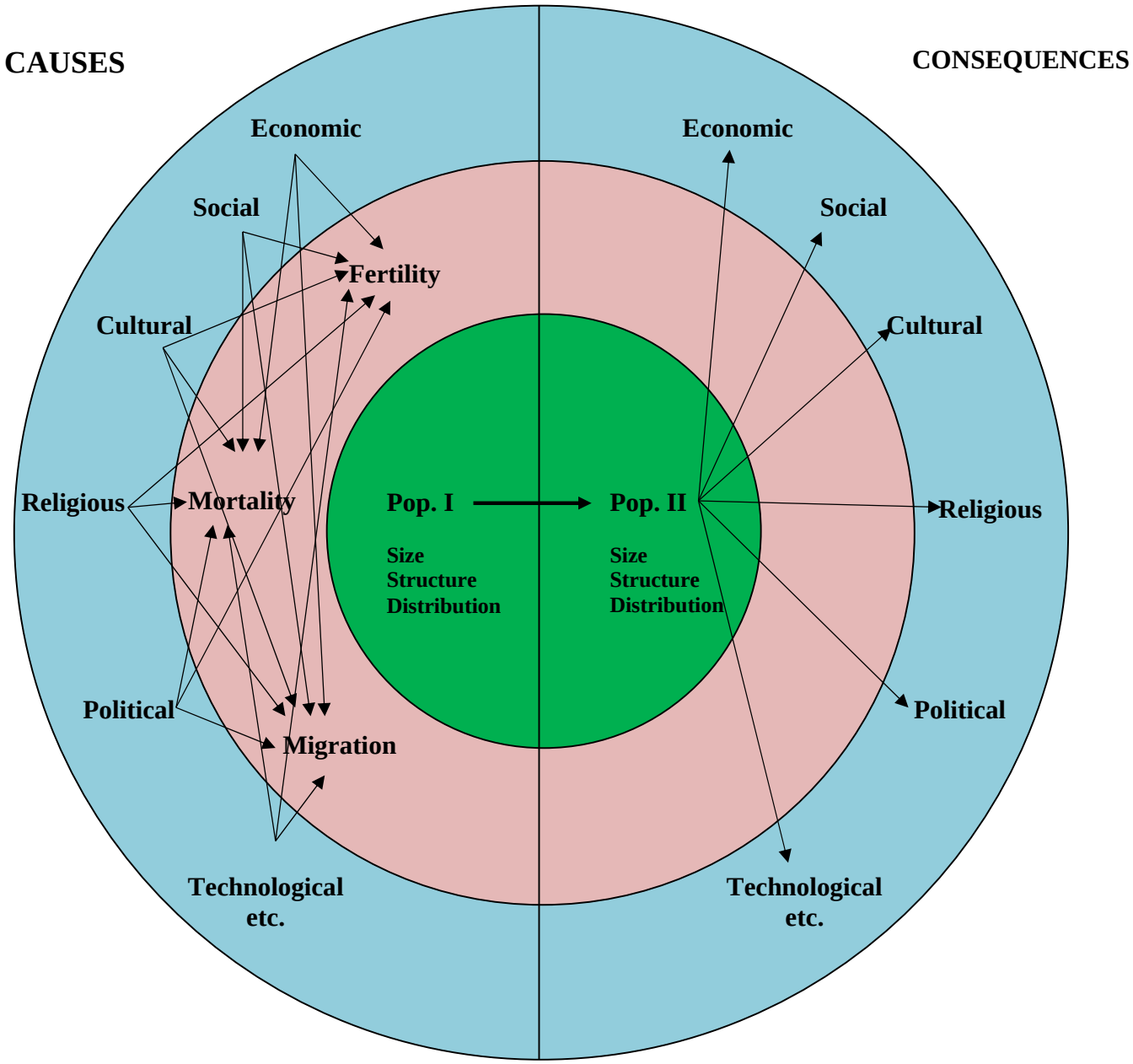
The most basic requirement for all policymakers and planners is the availability of an up to date and detailed picture of the characteristics of the population at a given point in time. These characteristics include:

- *Size*
- *Structure*
- *Distribution*

Nation-wide information concerning the size, structure and distribution of a population is collected during national censuses. By law, in most countries, censuses are conducted at regular intervals, usually a period of ten years. The Census Act in Fiji specifies that the intercensal period is ten years. In practice, some exceptions have been made, most importantly in the case of the most recent census in 2007. This census should have been conducted in 2006, or exactly ten years after the 1996 Census.

The census profile of a population can be considered as a snapshot or portrait of that population at the time of the census.

Figure A: Conceptual framework of the interrelationships between demographic, socio-economic and other variables.



Population characteristics: Size, Structure and Distribution
Population Processes: Fertility, Mortality and Migration (Variables of the first order)
Variables of the second order (or ultimate variables): Economic, Social, Cultural, Religious, Political, Technological etc.

Much of this report is concerned with the characteristics of the population of Fiji at the time of the 2007 Census. Structural characteristics of the population that have been analyzed include basic demographic variables (i.e. age, sex and marital status) as well as socio-economic characteristics (labour force participation, employment, unemployment, education, literacy and religion).

The characteristics of a population at a particular point in time are expressed in numbers, proportions and percentages, ratios etc.

1.2. Population processes

Everything is subject to change and this applies to demographic and socio-economic characteristics of a population as well. Consequently, policymakers and planners do not only need an accurate picture of the characteristics of the population at certain points in time but also of change that is taking place in these characteristics. Population change over a defined period of time (often a year) is measured by means of the population growth (r). This rate expresses growth as relative change in population size per year (in %).

The three demographic processes contributing to population change include:

- *Fertility*
- *Mortality*
- *Migration*

Fertility refers to the actual reproductive performance of a population and mortality to death as a component of population change. Natural increase is the surplus (or deficit) of births over deaths in a population in a given year. Natural increase is expressed in the form of a rate, the rate of natural increase (RNI). The RNI is defined as the crude birth rate (CBR) minus the crude death rate (CDR).[2]

[2] The following example provides an illustration of the computation of the CBR, CDR and RNI. According to the National Health Information System (NHIS) in Fiji, in census year 2007, 17,478 births and 6,359 deaths were recorded. The CBR and CDR are calculated by dividing the number of births and deaths by the population at mid-year 2007. In this example we will use the population enumerated during the 2007 Census, being 837,478 as a reasonable approximation of the mid-year population. Consequently the CBR in 2007 is:

CBR = 17,478 / 837,271 = .02087 or (rounded): 21 per thousand (‰)

Similarly, the CDR is:

CDR = 6,359 / 837,271 = .00759 or (rounded) 8 per thousand (‰)

From this, the RNI can be calculated as:

RNI = CBR – CDR = 21 – 8 = 13 per thousand (‰)

$$\mathbf{RNI = CBR - CDR}$$

The CBR and the CDR are usually expressed per thousand (‰).

Fertility and mortality are vital processes. Usually, these vital processes change only gradually.[3] Moreover, the determinants of change often affect fertility and mortality after a certain time lag. For instance, since the first coups in Fiji in 1987, the mortality transition began to level off, then stalled and there are now some indications that mortality (at least that of adults) may be increasing again. This is discussed in more detail in Chapter VII.

Population growth is not only the result of natural increase but also of migration. The population growth rate (r) is:

$$\mathbf{r = CBR – CDR + IMR – OMR}$$

or

$$\mathbf{r = CBR – CDR \pm NMR}$$

where

IMR is the in-migration rate
OMR is the out-migration rate
NMR is the net-migration rate

Migration, in the demographic/statistical sense implies a change in a person's "usual place of residence". Contrary to the vital processes, fertility and mortality, the level and pattern of migration often changes almost overnight due to socio-economic, political, religious and other push and pull factors. In other words, migration tends to disrupt the "normal" course of population change resulting from natural increase or decrease. Population change due to migration is often unpredictable and more difficult to measure than fertility and mortality change. International migration in Fiji since 1987 particularly that of the Indian component of the population, provides a very clear example of this.

In Chapter I of this Analytical Report, the population growth rate has been calculated from data from two successive censuses. This population growth rate must be interpreted as an average intercensal growth rate. For instance, if the growth rate is calculated from 1996 and 2007 census data for the total population of Fiji, the growth rate represents average annual growth over the 1996-2007 intercensal period for this population.

Contrary to the CBR and the CDR, the RNI is often expressed in %. In other words, the RNI for the year 2007 based on the vital events (births and deaths) recorded by the NHIS is 1.3 %.

[3] However, in the pre-transitional phase of the mortality transition in most countries, the level of mortality fluctuated wildly, due the combined impact of epidemics, famines, wars etc.

In order to measure the impact of demographic processes, a set of indices measuring the incidence and prevalence of demographic events, in other words statistics related to birth, death and migration over a certain period are required. Ideally, these statistics need to be collected on a continuous basis. In most countries, vital statistics (births and deaths) are a byproduct of the country's Civil Registration System (CRS).

The CRS has not been designed to collect migration statistics. In Fiji, the source of international migration statistics is the transit statistics (arrival and departure) collected by the Immigration Department at border checkpoints. On the other hand, information concerning internal movement of people should ideally be collected by means of a Continuous Population Register (CPR). Fiji does not have such a system. All these data collection systems are discussed in more detail in Section 2.

1.3. Determinants (causes) of population change

Apart from information on characteristics and processes, a comprehensive picture of a population should also include information concerning the causes of change, or in other words of the determinants of fertility, mortality and migration. These so-called ultimate variables are of an economic, social, cultural, religious, political or technological nature. As indicated in Figure A (by means of arrows), these factors are interrelated. A logical consequence of this is that studies dealing with the determinants of population change should adopt an interdisciplinary approach.

The following examples clarify how the determinants in Figure A may have an impact on the demographic processes:

- The first example refers to the relationship between economic determinants and mortality. Since the 1980s, the economy has stagnated. This stagnation is for instance suggested by some economic indicators like per capita national product, average household and personal income etc. It is likely that the stagnation in the economy has had an impact on the mortality trend in Fiji. The analysis in Chapter VII shows that, since the 1980s, the mortality transition (especially that of adults) has indeed stagnated as well. This is a functional relationship. The analysis cannot prove that there is a causal relationship between the stagnation in the economy and the stagnation in the mortality transition. However, it may reasonably be assumed that the stagnation in the economy has led to job losses, loss of income etc. These factors must have had a negative impact on the provision of health and educational services. In its turn, this has most likely led a stalling mortality transition, or even to an increase in the level of mortality. It is very difficult if not impossible to quantify exactly to what extent the stagnation in the economy has affected the stagnation in the mortality transition and to what extent other factors, i.e. the increase in lifestyle disease (cardiovascular disease, cancers, diabetes etc.) have contributed to the mortality trend in Fiji since the 1980s.

- A second example is concerned with the impact of social factors (for instance education) on fertility. Since the 1950s, the level of fertility of the Indian component of the population has decreased very fast. The fertility transition for the Fijian component started much later and has progressed at a very moderate pace. To what extent can the differential fertility

transition for the two main ethnic groups be explained by means of a change in the level of education? Census and other information shows that the level of education (as for instance measured in Chapter V (by means of enrollment rates, adult literacy rates etc.) has improved very significantly during the same period. Generally (but not necessarily always), an increased level of education and literacy leads to a decrease in the level of fertility. Generally, education and literacy are considered as important determinants of fertility. This is for instance suggested by a study of differential fertility in Fiji. Analysis of the results of recent censuses suggests that the level of fertility tends to decrease with an increasing level of education and literacy of women. However, this appears to be far more so in the case of Indian than in the case of Fijian women. This suggests that there must be other explanatory factors which also influence the level of fertility and which may be even more important than education. Examples include economic, religious and cultural factors. Once again, it is extremely difficult to quantify the exact impact of each potential determinant of fertility on the fertility transition of the two main ethnic groups since the 1950s.

- The last example concerns the impact of political factors on the third of the demographic processes: migration. Since the 1980s, migration, especially emigration from Fiji has increased dramatically. Once again, this is mainly so for the Indian population. To what extent are political factors responsible for this increased level of out-migration and how can the impact of political factors be separated from other possible determinants, for instance those of an economic nature (the “looking for greener pastures” factor)? Once again, in Fiji, the data to answer these questions is presently not available. It would need the results of a comprehensive and representative migration survey to separate the impact of the many determinants on migration trends in Fiji during the last few decades. A survey of this nature has never been conducted in Fiji.

The above examples can be extended ad infinitum. However, all examples would suggest that there is usually not just one explanatory variable (determinant) but a large number of them. Moreover, in most cases, these different determinants also influence each other. Figure A attempts to give an impression of the interdependency of the various explanatory factors and their impact on the demographic processes fertility, mortality and migration.

In most countries, especially in statistically underdeveloped countries, relatively little is known about the precise impact of all the possible determinants on the level and pattern of fertility, mortality and migration and therefore on the size, structure and distribution of the population. This kind of information cannot easily be collected in a census or by a registration system. It requires the conduct of in-depth surveys based on a representative sample of the population. Unfortunately, nationwide surveys of this nature are very costly and time-consuming. Consequently, they are seldom conducted and hardly ever on a regular basis.

In 2012, knowledge concerning the determinants of population change in many countries including Fiji is still based on small area studies and/or studies based on a small (often not random) sample of the population. These studies tend to be carried out by individual researchers such as economists, sociologists, social demographers, anthropologists etc. Unfortunately, it is not valid to extrapolate the findings of these studies to the nation as a whole or to its main

geographic subdivisions. Consequently, although the results of these studies are often of great value for the formulation of hypotheses concerning population change, they tend to be of limited value for day-to-day planning at the national and sub-national level.

In conclusion, our knowledge concerning the determinants of population change in Fiji is very limited, especially at the sub-national level. In many cases, our "knowledge" is based on conjecture instead of thorough scientific inquiry.

1.4. Consequences of population change

Finally, and probably most importantly, policy makers and planners require a picture of the likely size, structure and distribution of the population at some time in the future. This is a basic prerequisite for effective development planning. Moreover, they have to formulate the likely consequences of population change in the future.

In order to get an idea of the possible characteristics of the population at some future date, the population must be projected. Projections must be based on precisely defined assumptions with regard to future fertility, mortality and migration trends. These assumptions are sometimes based on trends in the recent past as well as official policy with regard to fertility, mortality and migration in the future.[4] The base of the projections is the present age-sex structure of the population.[5]In Fiji, the FBoS is responsible for the generation of official population projections.

Producing meaningful population projections is a far from easy task, particularly for populations with a very volatile pattern of population change. The comments about international migration made above, imply that it has become very difficult to formulate "reasonable" assumptions concerning future population change in Fiji. This is the reason why recent population projections made in Fiji are based on a wide range of scenarios and cover a relatively short period of time. It also needs to be stressed that, from the point of view of effective planning, it is essential that projections be updated at regular intervals and particularly after the country has experienced a major upheaval (i.e. a coup) which has changed migration levels and patterns significantly.

The study of the possible consequences of population change (i.e. economic, social, cultural, political, cultural, environmental and other consequences), is even more problematic than producing meaningful projections. This kind of study should once again be of an interdisciplinary nature.

In conclusion, in most countries much more is known about the "core" variables than about the "fringe" variables or the ultimate variables in the framework of Figure A. This is certainly the case in Fiji. The first and most basic responsibility of the FBoS is to collect information about the characteristics (size, structure and distribution) of Fiji's population at well-defined points in time. This implies that national censuses need to be conducted at regular intervals.

Secondly, as mentioned earlier, the responsibility for the collection of information concerning demographic processes (fertility, mortality and migration) lies with other government

[4] So far, Fiji has never adopted an official National Population Policy (NPP)

[5]In most countries, the most recent census age-sex structure is used as the base for population projections.

departments. However, many of these departments have, so far, not been able to provide complete and accurate information on a regular basis. This is particularly true for basic demographic statistics regarding birth and death that should be provided by the Civil Registration System (CRS) and the National Health Information System (NHIS). Consequently, during the last 60 years, the FBoS has also been charged with the collection of information from which basic fertility and mortality (as well as migration) indices can be estimated. The census contribution to the fertility, mortality and migration database in Fiji is discussed in detail in Chapters VII to IX of this Analytical Report.

2. Data collection systems in Fiji

This section provides a brief assessment (availability, level of completeness and accuracy) of the various data sources in Fiji.

A first general comment that needs to be made is that a comprehensive quantitative database should consist of two types of statistics viz.

- *Stock statistics*
- *Flow statistics.*

Stock statistics refer to a particular point in time. For instance, the 2007 Census provides a portrait (or snapshot) of the characteristics of the population (size, structure and distribution). More precisely, this portrait includes the main demographic and socio-economic characteristics of the population at midnight on Sunday, 16th of September (Census Night) of that year.

Flow statistics do not refer to a fixed point in time. These statistics are collected continuously by means of a recording or registration system. They are usually compiled for a particular period i.e. a year. In most countries, the most well-known examples of flow statistics are the vital events (births and deaths) collected by the Civil Registration System (CRS) of the Registrar General's Office (RGO) and the statistics concerning fertility, mortality, morbidity, cause of death etc. collected by the National Health Information System (NHIS) of the Department of Health (DOH).

Planners in most western countries rely on a large variety of data sources. In statistically underdeveloped countries, some of these sources are often either non-existent or incomplete and/or otherwise deficient. The most common data collection systems, which will briefly be discussed in this section, include the following primary sources:

- *Civil Registration System (CRS)*
- *Service (Administrative) Statistics*
- *Population Censuses*

- *Sample Surveys*

These systems should provide most of the information required by policy makers, planners and other users.

2.1. Civil Registration System (CRS)

Most countries have some form of legal provision and permanent organization for the registration of vital events (births and deaths). Compared to most countries in the developing world, including those in the South Pacific Region, civil registration in Fiji was introduced at a relatively early stage. The Registration Ordnance of 1892 was the first basis for registration of all vital events in Fiji. This ordinance has on several occasions been amended. Since 1975, the ordinance is referred to as the Births, Deaths and Marriages Registration Act. Citizens of Fiji are legally obliged to report all vital events to the Registrar General's Office. In the case of non-compliance, it is the task of the Civil Registration Office to enforce the act.

The CRS is primarily a legal/administrative system. The collection of vital statistics is a byproduct, albeit a very important byproduct of the system. In those countries where the CRS collects complete and accurate information concerning the events birth and death, this system provides a continuous picture of the mortality and fertility situation and trends in the country. Unfortunately, in many countries, the collection of vital events by the CRS tends to be incomplete and inaccurate. This also applies to Fiji. In spite of the fact that Fiji's CRS has now been in place for more than 100 years, all reviews that have been conducted indicate that this system never achieved a statistically satisfactory level of completeness and accuracy. This applies in particular to death registration. As a result, the CRS has contributed very little to our knowledge of the demographic situation and trends in Fiji. Furthermore, these reviews, including the most recent one conducted in 2006, suggest that Fiji's CRS will probably not be in a position to produce a complete and accurate set of statistics concerning vital events in the near future.

As a result, information concerning fertility and mortality in Fiji, has, since 1946 mainly been derived by means of indirect analysis of retrospective data collected during censuses. Recently, the service statistics included in the National Health Information System (NHIS) have played an increasingly more important role. This is discussed in the next section.

2.2. Service (administrative) statistics

Several government departments collect or are supposed to collect demographic, socio-economic and other flow statistics for their own purposes (planning, monitoring and evaluation etc.). These service or administrative statistics need to be collected on a continuous basis using the departmental network. In Fiji, the service statistics of some departments, especially those of the Department of Health (DOH) and the Department of Education (DOE) have been analyzed in conjunction with that of the censuses. The systems of service statistics of the DOH and the DOE are briefly discussed below and also in the relevant chapters of this Analytical Report.[6]

[6] Education data is discussed in Chapter V and mortality and fertility data in Chapter VII and VIII respectively.

- Department of Health: The National Health Information System

The National Health Information System (NHIS) routinely collects information on the incidence and prevalence of various aspects of health, morbidity, mortality, cause of death, fertility, reproductive health, family planning etc. It uses its own network of health facilities throughout the country. Because of the nature of most health, morbidity and mortality information, it can only be collected and recorded by trained health personnel. There is no alternative data collection system for the specialized information collected by the NHIS.

For the purposes of demographic analysis, it is important that the NHIS also records all vital events (births and deaths) that occur in hospitals and other health facilities throughout the country. Moreover, health personnel in the country has been instructed to record all other births and deaths they attend to at other places than these health facilities. Given full registration coverage of these vital events by doctors, nurses and other health personnel, the NHIS should be in a position to provide annual updates of fertility and mortality levels, patterns and trends.

Coverage of vital events by the NHIS has improved during the last few decades. However, reviews of the system in the recent past have shown that, in spite of these improvements, coverage is not yet complete. Nevertheless, since 1976, fertility and mortality indices have been estimated from the NHIS data. This has been done in conjunction with census fertility and mortality analysis. The results suggest that, since 1996, birth and death registration by the NHIS has achieved a reasonable level of completeness and accuracy. Unfortunately, this data cannot yet be published by usual place of residence of those undergoing the events birth and death. Consequently, it is not yet possible to estimate fertility and mortality indices at the sub-national (i.e. provincial) level from this data. Similarly, estimates for the geographic sectors cannot yet be made. Work is in progress to ensure that, in future, it will be possible to derive the usual place of residence at the provincial level and the rural/urban status of those undergoing the events births and deaths from all birth and death certificates.[7] Presently, for the estimation of fertility and mortality indices at the sub-national level and the geographic sectors, Fiji continues to rely on census data.

- Department of Education (DOE)

Like the DOH, this department also has its own network (of educational institutions) throughout the country. This system routinely collects information concerning access to school (enrollment), retention and achievement of the at-school population. The main drawback of the system of service statistics of the DOE is that it is restricted to the at-school population. For planners, it is equally and probably even more important to have

[7] It is particularly problematic to derive the rural/urban residence from birth and death certificates. It cannot be expected that all medical personnel completing birth and death certificates is familiar with the delineation of census/statistical urban areas in Fiji. They should provide a precise description of the place of birth of new-born babies and the usual place of residence of deceased persons. For statistical/demographic purposes, the place of birth of a person is the usual place of residence of the mother of this person at the time of his/her birth.

information concerning educational attainment for the not at school population. Consequently, all censuses in Fiji since 1946 have attempted to collect this information. The service statistics on education from the DOE and the education data from a census are complementary. This is briefly discussed in Chapter V of this Analytical Report.

The link between other systems of service statistics and census data is not as close. At present, their contribution to Fiji's database tends to be minimal. Ideally, there should be a close link between the system of service statistics from the Department of Labour and Employment (DLE) and census analysis of labour force, employment and unemployment data. This is not the case, simply because the system of service statistics of this department does not collect and publish nationwide statistics on labour force participation, employment and unemployment. The infrastructure for the collection of these statistics by the DLE is not in place. In Fiji, the FBoS collects detailed information on the labour force in specialized Employment and Unemployment Surveys. Moreover, censuses provide basic information on labour force participation, employment and unemployment at the national as well as the provincial level. This is discussed in Chapter IV of this Analytical Report.

Finally, it should be mentioned that the FBoS has its own collections of flow statistics with regard to national accounts, import, export, trade, business and other economic statistics.

2.3. Population census

The census is the main source of nation-wide stock statistics. Census information refers to a fixed point in time: Census Night. The census does not only provide statistics at the national level but at the sub-national level as well, down to the smallest geographical unit. This smallest census/statistical unit in Fiji is referred to as Enumeration Area (EA). The EA can be considered as a census/statistical "building block".

For operational, financial and other reasons, there are limitations to the amount and level of sophistication of stock information that can be collected nation-wide during a census. More complicated and specialized stock statistics are usually collected by means of a survey on a sample basis. It will be noted that census information provides the denominators of virtually all rates that are being.

In countries where complete and accurate flow statistics regarding birth and death are produced by the CRS and/or NHIS, a census only collects stock statistics. Unfortunately, since these primary sources in Fiji cannot yet provide complete and reliable birth and death statistics on a continuous basis, information related to fertility and mortality has, since 1946, been collected by means of retrospective questions on the census interview schedule. A brief history of census taking in Fiji is included in Section 3.

Finally, it will be realized that, even if in the coming years other data collection systems achieve a statistically acceptable level of completeness and accuracy, planners at the sub-national level, i.e. the provinces will largely remain dependent on census data. The most important reason for this is that (sample) surveys in Fiji do not provide information that is valid at the sub-national (i.e. provincial and lower) level. It is likely that this will remain so in the foreseeable future.

2.4. Survey

The collection of information through censuses is restricted to basic demographic and socio-economic characteristics of the population (and households). Whenever more specialized information is required, this should be collected in a survey based on a sample. A (sample) survey is a canvass of selected persons or households in a population. In other words, information is not collected for all persons (or households) in the country (like in a census) but only for a selection of the persons (or households) in the country. This selection is called a sample.

The most important characteristic of a proper scientific sample is that it is representative of the entire population or that it is designed to provide statistics that are representative of the entire population. In order to achieve this, the sample must be drawn according to definite rules. In a Simple Random Sample (SRS), elements included in the sample should be drawn from a universe (sampling frame) in such a way that every single element has an equal chance of being included. If this rule is followed to the letter, in other words, the sample is chosen completely randomly, it will be representative of the entire population. The main objective of a (sample) survey is therefore to infer demographic and socio-economic characteristics or trends for a larger segment or the entire population from the sample data.

The design of the sample depends on the objectives and purposes of the survey, the parameters that need to be estimated, the detail of the data that is required and of course time and cost factors. Surveys can be Single Round Retrospective Surveys (SRRS) or Multi Round Retrospective Surveys (MRRS).

During the last few decades, survey taking has become increasingly more important. This is the result of the ever-increasing demand for more and more detailed data by policy makers, planners and other users. For operational, financial and other reasons, a census cannot meet all these additional demands. Moreover, there is often an immediate demand for this data. In most countries, the census is only conducted once every ten years. However, any time a country experiences a major upheaval, it is likely that health, education and other services will suffer, that many people lose their job, that wages will be reduced and that nutritional standards will drop. This implies that expenditure patterns will change and this affects the “basket of goods” for the Consumer Price Index (CPI). In these cases, the country needs to conduct a Household Income and Expenditure Survey (HIES) that represents the altered socio-economic realities in the country.[8]

For obvious reasons, surveys in Fiji are usually based on multi-stage sampling (area sampling at one or more stages i.e. administrative subdivisions, geographic sectors etc.) combined with the use of clusters that have clearly delineated boundaries. So far, all sample surveys in the country have been of the SRRS variety. In spite of the many sample surveys that have been conducted in

[8] Under normal circumstances, a HIES is usually carried out at regular intervals. This interval should preferably not be more than ten years.

Fiji, this data collection system must be considered as underutilized, especially with regard to non-economic (demographic and social) surveys.[9]

During the most recent intercensal period 1996-2007, the FBoS has conducted two sample surveys viz. a Household Income and Expenditure Survey (HIES) in 2002 – 2003 and an Employment/Unemployment Survey in 2004-2005. For policy makers and planners at the provincial level, it is important to note that the results of these and other sample surveys are only valid at the national level and sometimes at the divisional level, but not at the provincial level. In order to get survey results that are valid at the provincial level, the size of the sample would have to be increased very drastically. In this respect, it should also be mentioned that, in countries with enormous disparities between geographic subdivisions or subgroups, national averages, provided by sample surveys are not a very useful guide for sub-national planners.[10]

In conclusion, for small area planning in Fiji (i.e. planning at the province and the tikina level), the census will probably always remain the main data source.

3. Censuses in Fiji

Fiji has a longer history of census taking than most developing countries. Its first census (a mere headcount of the population) was carried out by the British Administration, as early as 1881. After this, until 1921, censuses (headcounts) were conducted at an interval of 10 years. Due to the worldwide recession in the 1930s, the next census had to be postponed to 1936. In 2012, no records of the censuses prior to 1911 have survived. However, the number of persons by sex that were enumerated during these censuses is known, since this information has been reproduced in the Report of the Census carried out in 1911. The data from these early censuses shows that, until 1901, the population of what was then known as the Colony of Fiji, steadily decreased. Moreover, the sex ratio of the population at that time appears to be very high. (See Table A).

Printed reports of the 1911, 1921 and 1936 Censuses are still in existence. It appears that, after 1901, the population started to increase steadily at a rate between one and two percent per year. Although these censuses provided somewhat more information than the early ones, they are, as far as the indigenous people is concerned, still not much more than simple headcounts.

Formal census taking only started in 1946. This census, conducted soon after the end of World War II, provides more detailed information than the previous ones. The Interview Schedule of the 1946 Census included the usual basic questions such as age, sex, ethnicity, place of birth, usual place of residence, marital status, religion, language and school attendance as well as

[9] In this respect, it is important to note that Fiji has never conducted a Demographic and Health Survey (DHS). It will be clear that in order to be able to derive statistically valid basic demographic indices from a SRRS, i.e. age and sex specific death rates required for the production of lifetables, the size of the sample should be at least 100,000. Otherwise, the sampling errors, especially for ASDRs for the age range where mortality is low, will become unacceptably high. Ideally, the future DHS should therefore be a MRRS, in which case a smaller sample size will suffice.

[10] Within the South Pacific Region, a typical example of this can be found in Papua New Guinea (PNG). The differences in demographic and socio-economic indices between the provinces of this country are enormous. Differences between the provincial indices in Fiji are much smaller.

highest level of education completed. It is particularly important to note that this census included questions from which fertility and infant and child mortality can be estimated indirectly. The 1946 Census in Fiji was one of the first in the entire world to do so. As a result, it has been possible to derive basic parameters of fertility and mortality of the population of Fiji for the entire post World War II period. The 1946 Census also included some basic housing questions and questions concerning "infirmities" and poultry.

Unfortunately, most of this information has only been compiled and published at the national level. It will be realized that, at the time of the 1946 Census, all information was processed, edited, compiled and tabulated by hand. The production of very detailed cross tabulations was not feasible. This also applies to more detailed tabulations at the sub-national level i.e. the provinces. However, for the provincial authorities, it is important to note that the 1946 Census was the first one that provided a picture of the most basic characteristics of the population of their province, most importantly the age-sex structure of the population.

The census conducted in 1956, deserves a special mentioning. In some ways, it can be considered as the first modern census in Fiji. Moreover, this census, particularly the design of its questionnaire, served as a blueprint for future censuses in all British colonies in the South Pacific as well as some other territories in the region. During the subsequent four censuses, until 1996, the census questionnaire was gradually extended and improved.

The historical development of the total population by sex from the time the first census (headcount) was taken in 1881 to the last one in 2007 is presented in Table A.

Table A: Total population of Fiji enumerated during the censuses from 1881 to 2007

Census		Interc.	Population			Sex
Year	Date	Period	P	M	F	Ratio*
1881	**4 April**	-	127,486	70,401	57,085	123
1891	**5 April**	10.003	121,180	66,367	54,813	121
1901	**31 March**	9.986	120,124	66,874	53,250	126
1911	**2 April**	10.006	139,541	80,008	59,533	135
1921	**24 April**	10.060	157,266	88,464	68,802	129
1936	**26 April**	15.006	198,379	107,194	91,185	118
1946	**2 October**	10.436	259,638	136,731	122,907	111
1956	**26 September**	9.984	345,737	178,475	167,262	107
1966	**12 September**	9.962	476,727	242,747	233,980	104
1976	**13 September**	10.003	588,068	296,950	291,118	102
1986	**31 August**	9.964	715,375	362,568	352,807	103
1996	**25 August**	9.984	775,077	393,931	381,146	103
2007	**16 September**	11.060	837,271	427,160	410,111	104

* The sex ratio is the number of males divided by the number of females times 100

In conclusion, in the absence of complete and reliable data from most other sources, policy makers, planners and researchers in Fiji have so far relied very heavily on census data. In fact, the census has remained the main source of complete and reliable, albeit rather basic information in Fiji. In particular, for planning at the sub-national level, one remains, until today, almost entirely dependent on census information. Consequently, all policy makers, planners, researchers and other users of census data need to be thoroughly familiar with this data, including their potential and quality as well as their shortcomings and limitations.

4. The 2007 Census

This section provides some additional comments on the most recent census conducted in 2007.

4.1. Legal base

All censuses since 1946 were conducted under the provisions of the Census Act of 20th July 1946 (Ordinance No. 6 of 1946). With regard to the 2007 Census, the Minister of Finance issued a Census Order in July 2007. This order states that a census of all the inhabitants of Fiji must be conducted between 16th September and 16th October 2007. Subsequently, the Public Services Commission (PSC) appointed the incumbent Government Statistician (GS) as the Census Commissioner. After the Census Order came into effect, the Census Commissioner issued the Census Regulations for the 2007 Census. These regulations state that all persons in Fiji (including any vessels within the territorial waters of Fiji) on Census Night should be included in the 2007 Census.

4.2. Census objectives

The objectives of the 2007 Census are stated in the Census Regulations for this census. These Regulations also specify that the following information needs to be collected:

- Size of the population.

  The first requirement of the census is that it should establish the number of people staying in the country on Census Night as well as the rate at which the population is growing.[11]

- Structure (composition) of the population

  This refers to the main demographic and socio-economic characteristics of the population on Census Night. (This refers first of all to the age-sex structure of the population but also to marital status, religion, education and training, labour force etc.).

[11]By comparing the enumerated during the 2007 Census with that of the previous census in 1996, an estimate can be made of the average annual rate at which the population has been growing during the intercensal period.

- The distribution of the population

  The census does this by recording the place where people are enumerated at the time of the census. In this respect, it is important to note that the 2007 Census did not only record the place of enumeration of all respondents but also their usual place of residence. The 2007 Census was the first one to do so. In Fiji, the census is the only data source that provides basic information about the distribution of the population for all geographic subdivisions down to the Enumeration Area (EA) level.

- The type of dwelling.

  Like in 1996, the 2007 Census is not only a Census of Population but also a Census of Housing.

- Demographic processes

  Last but not least, since complete and reliable information concerning fertility and mortality from the primary source of this data, the CRS remains very incomplete and deficient and NHIS data with regard to fertility and mortality remains very limited and unavailable at the provincial level and for the geographic sectors, the 2007 Census also included once again a series of retrospective questions from which this information can be estimated indirectly. Moreover, in the absence of a Continuous Population register, the census also collected basic information on internal migration.

In addition, as a result of special requests made by members of the Census Users Advisory Committee, the 2007 Census also included some basic questions concerning koro dina, disability, remittances and mode of transport.

In conclusion, the 2007 census was first of all concerned with the core variables of the population of Fiji on Census Night, viz. its characteristics (size, structure and distribution). Furthermore, in the absence of complete and accurate service statistics concerning demographic processes (fertility, mortality and migration), it also collected this information by means of retrospective questions. Finally, it collected some basic household and housing information.

4.3. Census principle of periodicity

Between 1936 and 1996, the timing of all censuses has been in agreement with the Census Act. They have been conducted at a decennial interval. According to the Census Act, the most recent census should have been conducted in 2006. Unfortunately, because of the national elections in 2006, this census was postponed to 2007. This postponement is not only in disagreement with the Census Act, but also with one of the most basic principles of census taking, that of periodicity. The postponement of the census has negative implications, especially with regard to census analysis in particular areas such as fertility and mortality.[12]

[12] An important part of the indirect analysis of fertility and particularly mortality from census (survey) data is the use of models. In most of these models, it is assumed that the interval between subsequent censuses is a multiple of five years. In those cases where this ideal requirement is not met, adjustments should preferably be made. An example is

4.4. Exact timing of the census

A census should ideally be conducted during a "quiet" and stable period of the year, when the number of people away from their usual place of residence, is minimal. Moreover, in Fiji, the hurricane season from October to April should be avoided as well as periods of political or other instability. In Fiji, these concerns have become particularly important since the coups of 1987 and even more so the coup in 2000. In 2006, the period leading up to, during, and after the national elections was also considered as a period of potential instability. Because of the coup in December 2006, the census had to be further postponed. Census Night was finally firmly established as midnight of Sunday the 16th of September 2007.

Because of a large variety of practical considerations, the census date that is selected is seldom ideal. It will, however be realized that, the choice of a less than ideal period of the year for the conduct of a census will most likely have a negative impact on census coverage as well as on the quality of the collected data.

4.5. Coverage

Even under the most ideal conditions during a census, it is far from easy to achieve optimal coverage and adequate data quality. This applies in particular to difficult areas of the country. In Fiji, difficult areas for census/enumeration purposes are first and foremost some of the numerous squatter areas. Generally, it is easier to achieve good coverage in the rural than in the urban sector of Fiji, partly because of the much higher mobility of the urban population. Coverage problems in Fiji tend to be largely concentrated in the Lami-Suva-Nasinu-Nausori Corridor and to a less extent in the Nadi-Lautoka Corridor.

4.6. Census forms

During the 2007 Census, information was collected on three different forms viz.:

- Interview Schedule (IS)

  This schedule was used for the vast majority of households residing in private dwellings (PD). Enumerators collected the information about household members in face-to-face interviews. Readers are again reminded that during a census, one senior member of the household often answers the census questions for all household members.[13]

- Self-Filling Questionnaire (SQ).

  This questionnaire includes the same questions as the Interview Schedule. In 2007, this questionnaire has been used for self-enumeration by a relatively small number of

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the estimation of adult mortality from maternal and paternal orphanhood data from two censuses, i.e. the 1996 and 2007 Censuses of Fiji. This is explained in Chapter VI.

[13] This is not the case during a much more manageable specialized survey based on a sample of the population, where everybody included in the sample is subjected to a personal interview by an experienced interviewer.

households. Virtually all these households are residing in parts of a few urban areas that have been classified as high-class. Access to and interviewing of the members of these high-class households is sometimes very difficult.[14] An investigation of the information collected by means of the Self-Filling Questionnaire during the 2007 Census, confirms the concerns that were already expressed after the Pilot Test of the census. Generally, contrary of what one would expect, this data is of lower quality than that collected during face-to-face interviews. In future, for operational, financial and other reasons, census information for an ever increasing proportion of all households will undoubtedly be collected by means of a self-filling questionnaire. However, so far, this approach in Fiji has not yet become very promising. For the near future, the use of a Self-Filling Questionnaire will probably remain a last resort.

- Special questionnaire for institutionalized persons residing in Non-Private Dwellings (NPD)

  Some people do not live in a private household but in an institution (hospital, corrective institution, barracks, boarding school etc.) or on board of a ship. For census purposes, these persons are members of a collective household. A special questionnaire has been used for the enumeration of the members of these collective households. It contains a subset of the questions included on the Interview Schedule and the Self-Filling Questionnaire and is therefore referred to as the "Short Form". The basic information that is required for the "institutionalized" persons is available from the official records of these institutions. Prior to the census, the FBoS appointed a Census Coordinator for each of these institutions. These Census Coordinators are persons employed by these institutions who have access to the personal records of the institutionalized persons in their institution. These Census Coordinators have completed the special questionnaire for their institution using the recorded information.

4.7. The census and national elections

The small area data provided by the 2007 Census (down to the EA level), has been used by the Electoral Boundary Commission (EBC) to redraw the boundaries of the Constituencies.

5. Contents of this Analytical Report

The analysis in this Analytical Report is not only based on 2007 Census data. Whenever this is possible, comparisons have been made with the results from previous censuses, especially the 1996 Census. Furthermore, the analysis has been carried out for the main ethnic groups in Fiji (Fijians, Indians and Others) as well as by geographic sector (rural and urban). In many cases, provincial level estimates have also been included. However, more comprehensive information at the provincial level will be published in the Provincial Profiles. Finally, as in the case of the

[14] In many cases, these high class dwellings are fenced in and access to the inhabitants is often far from easy, even in those cases where the property is protected by security guards. The dogs on the compounds of many of these high class properties form an additional problem for enumerators. Finally, the owners of these properties tend to be absent during the day, and it is often far from easy to arrange a suitable time for a census interview.

1996 Census, an analysis of vital registration data has again been incorporated. Unfortunately, because of unavailability of NHIS data regarding birth, the analysis had to be restricted to death registration data.

- Chapter I is concerned with the most basic characteristics of the population of Fiji, viz. its size, growth, distribution and density.

- Chapter II focuses on the most basic structural characteristics of the population: age and sex.

- Chapter III deals with marital status.

- Chapter IV presents a very detailed analysis of the structure of the labour force. After the 1996 Census, the analysis only included a very basic analysis of labour force, employment and unemployment issues. A more comprehensive analysis of the relevant 1996 census data is included in this chapter.

- Chapter V deals with education, training and literacy but concentrates on the not-at-school population. An analysis of the relevant 1996 Census data is again included.

- Chapter VI includes a basic comparative analysis of religious affiliation as reported during recent censuses

- Chapter VII consists of three parts, A, B and C. Part A deals with the direct analysis of mortality data recorded by the National Health Information System (NHIS) of the Department of Health. Part B contains an indirect analysis of retrospective mortality data collected during the 2007 Census. Part C presents a picture of the mortality situation and trend based on the analysis of the data from these two sources.

- Chapter VIII is concerned with the analysis of retrospective census data on lifetime and current fertility. A comparative analysis of fertility data collected by the NHIS has not been included since the required detailed birth registration data from this source covering the last 10 years has not yet been made available.

- Chapter IX consists of two parts, A and B. Part A contains an analysis of the different types of internal migrants and also lifetime and recent interprovincial migration. It presents the inter-provincial net-migration rates required as input for the sub-national population projections. Part B is concerned with inter-sectoral migration especially between the rural and urban sector as well as migration to individual urban areas.

- Chapter X presents a basic picture of household and housing information collected during recent censuses.

- The final Chapter XI contains a summary as well as some recommendations for future censuses.

Several appendices, dealing with specialized topics related to the census have been attached.

6. Further Research

This Analytical Report is only the first step in the analysis of the 2007 Census. It will be followed by a series of Provincial Profiles, Research Monographs and research papers/reports.

- Provincial Profiles

  The FBoS will produce a Provincial Profile mainly based on census data for each of the 14 provinces and Rotuma.

- Research Monographs

  Several 2007 census topics will be the subject of a Census Research Monograph, written by non-FBoS staff with funding provided by UNFPA. Monographs concerning the following census topics have been scheduled:

  - Fertility
  - Gender
  - Urbanization
  - Housing.
  - Labour force

Further census related research to be carried out by the FBoS has been detailed in Chapter XI.

I. POPULATION SIZE, GROWTH, DISTRIBUTION AND DENSITY

1. De-facto and de-jure censuses

The census is the only data source that has been designed to provide basic demographic and socio-economic information for all persons within its defined scope at one particular point in time. A census is either conducted as a *de-facto* or *de-jure* operation.

- In a *de-facto* census, all persons present in the country at a certain point in time (census night) are included in the enumeration. Moreover, all persons (with the exception of a few well-defined cases) are enumerated in the household where they happen to be on census night.

- A *de-jure* census is an enumeration of all those who are usually present in the household (or those who belong to the household). In other words, a de-jure census provides a picture of the usual composition of a household irrespective of where household members actually were on census night.

Generally, census administrators prefer the de-facto approach since it is conceptually easier than a de-jure enumeration. A de-jure census needs to be defined in terms of "duration of stay" and this often causes significant problems of interpretation. It is more straightforward to organize and manage a de-facto census.

On the other hand, policy makers and planners are not only interested in a de-facto but often even more in a de-jure picture of the population of all geographic subdivisions of the country. In order to accommodate their requirements to some extent, several countries that conduct their census on a de-facto basis, have included a de-jure element. This de-jure element entails that all those who are covered under the de-facto rule, are asked an additional question about their "usual place of residence" on census night. However, the addition of this de-jure element does not mean that the census has become a de-jure census. In principle, it remains a de-facto operation.

All censuses in Fiji so far have been conducted on a de-facto basis. The 2007 Census was also a de-facto census, but it included the above-mentioned de-jure element. This means that all persons present in the country at midnight 16 September have been included in the census. They have been enumerated at the place (household) where they spent census night, irrespective of their usual place of residence. However, the usual place of residence of all these persons on Census Night was also recorded. Table I-1 provides a comparison of the 2007 Census populations by province of enumeration (de-facto) and by province of usual residence (de-jure).The information is given for the main ethnic components of the population: Fijians, Indians and Others.

Table I-1: Comparison of the 2007 Census population by province of enumeration (de-facto) and by province of usual residence (de-jure).

Province	Type of Enum.	Total Pop.	Fijians	Indians	Others
Fiji	**De-facto**	837,271	475,739	313,801	47,731
	De-jure	837,271	475,739	313,801	47,731
	Difference	0	0	0	0
Provinces of the Central Division					
Naitasiri	**De-facto**	160,760	93,124	58,496	9,140
	De-jure	156,284	90,822	56,630	8,832
	Difference	4,476	2,302	1,866	308
Rewa	**De-facto**	100995	62173	24082	14740
	De-jure	100406	62387	23976	14043
	Difference	589	-214	106	697
Tailevu	**De-facto**	55692	40186	14212	1294
	De-jure	56087	40583	14241	1263
	Difference	-395	-397	-29	31
Namosi	**De-facto**	6898	6159	514	225
	De-jure	7859	6570	919	370
	Difference	-961	-411	-405	-145
Serua	**De-facto**	18249	11138	5830	1281
	De-jure	17065	10732	5248	1085
	Difference	1184	406	582	196
Provinces of the Western Division					
Ba	**De-facto**	231760	96852	126142	8766
	De-jure	232217	96212	127508	8497
	Difference	-457	640	-1366	269
Nadroga	**De-facto**	58387	35075	22140	1172
	De-jure	56328	33692	21583	1053
	Difference	2059	1383	557	119
Ra	**De-facto**	29464	20259	8888	317
	De-jure	30219	20820	9104	295
	Difference	-755	-561	-216	22
Provinces of the Northern Division					
Bua	**De-facto**	14176	11183	2367	626
	De-jure	14829	11700	2483	646
	Difference	-653	-517	-116	-20
Cakaudrove	**De-facto**	49344	35978	7929	5437
	De-jure	50622	37149	7986	5487
	Difference	-1278	-1171	-57	-50
Macuata	**De-facto**	72441	28197	42550	1694
	De-jure	73075	28111	43174	1790
	Difference	-634	86	-624	-96

Provinces of the Eastern Division					
Kadavu	**De-facto**	10167	9964	49	154
	De-jure	10835	10569	30	236
	Difference	-668	-605	19	-82
Lau	**De-facto**	10683	10540	88	55
	De-jure	11451	11311	73	67
	Difference	-768	-771	15	-12
Lomaiviti	**De-facto**	16253	14822	494	937
	De-jure	16226	14883	475	868
	Difference	27	-61	19	69
Rotuma	**De-facto**	2002	89	20	1893
	De-jure	2156	138	29	1989
	Difference	-154	-49	-9	-96
Outside Fiji	**De-jure**	1,612	60	342	1,210

Provinces with a larger de-facto than de-jure population include Naitasiri, Serua, Rewa, Nadroga and Lomaiviti. The difference between the two counts is by far the largest in the case of Naitasiri. It has been suggested that this may be due to the fact that many students residing and enumerated in Naitasiri Province have reported their province of origin as their usual place of residence. This may be a factor but, if so, it would not explain why students in Rewa Province have not done this to the same extent. For all other provinces, apart from the above-mentioned, the de-jure population is larger than the de-facto population.

The sum of the differences between the de-facto and de-jure populations at the provincial level does and should add up to 0. The reason is that the 2007 Census was basically a de-facto census with a de-jure element. Only the usual place of residence of those present in Fiji at the time of the census was recorded and not of those who were temporary overseas at the time of the census.

2. Population change since 1881

During the 2007 Census, 837,271 persons (citizens and residents) were enumerated in Fiji. Table I-2 provides an overview of the growth of the total population during all intercensal periods since 1881. Population growth in this table (as well as in subsequent tables) is expressed:

- In absolute terms or as the increase in numbers during the intercensal period.
- In relative terms or as the percentage increase during the intercensal period
- As an average intercensal rate of growth per year (r in %)

Furthermore, the last column in Table I-2 refers to the doubling time (d) corresponding with the growth rate (r) in the previous column. It expresses the number of years it would take for the population to double in size, given continuation of that growth rate.

Table I-2: Size and growth of the total population between 1881 and 2007

Interc. Period.		Census Population		Intercensal Pop. Change			Doubl. Time (yrs)[@]
P_1 (Yr)	P_2 (Yr)	P_1 (Nr)	P_2 (Nr)	Abs. (Nr)	Rel. (%)	r* (%)	
1881	**1891**	127,486	121,180	-6,306	-4.9	-0.5	-137
1891	**1901**	121,180	120,124	-1,056	-0.9	-0.1	-791
1901	**1911**	120,124	139,541	19,417	16.2	1.5	46
1911	**1921**	139,541	157,266	17,725	12.7	1.2	58
1921	**1936**	157,266	198,379	41,113	26.1	1.6	45
1936	**1946**	198,379	259,638	61,259	30.9	2.6	27
1946	**1956**	259,638	345,737	86,099	33.2	2.9	24
1956	**1966**	345,737	476,727	130,990	37.9	3.2	21
1966	**1976**	476,727	588,068	111,341	23.4	2.1	33
1976	**1986**	588,068	715,375	127,307	21.6	2.0	35
1986	**1996**	715,375	775,077	59,702	8.3	0.8	86
1996	**2007**	775,077	837,271	62,194	8.0	0.7	99

Notes:

* The annual rate of growth (r) has been calculated from the formula $r = \ln (P_2/P_1)/n$, where n is the length of the intercensal period (given in Table I).

[@] The doubling time (d) has been calculated from the formula $d = \ln 2/r$. A minus sign means that this is a "halving" time.

The rates (r) in Table I-2 indicate that during the first decades after World War II, Fiji's population experienced a very high rate of growth. Since 1966, the situation started to change rapidly, mainly due to very fast decrease in Indian fertility. By 1980, the national population growth rate was down to about 1 percent per year.

After 1986, the growth rate dropped below 1 percent per year, mainly due to a very high rate of emigration of the Indian component of the population as well as further fertility decrease. During the 1996-2007 intercensal period, the growth rate decreased further, albeit very marginally, to 0.7 percent per year. It will be noted that, in spite of increased emigration and further decline in fertility (especially that of Indians), the increase in numbers between 1996 and 2007 is still somewhat higher than between 1986 and 1996.[15]A possible reason is that coverage in 2007 may have been slightly more complete than in 1996. There is some circumstantial evidence that this may have been the case.

[15] The Net Reproduction Rate (NRR) of the Indian population is now less than 1.0. This implies that this population is now below replacement level. (See Chapter VIII).

3. Population size and growth by ethnicity

3.1. The variable ethnicity in statistics in Fiji

Fiji is a country with people from a large variety of ethnic backgrounds. By far the largest groups are the Fijians and Indians. For policy makers, planners, researchers and other users it is very important to have a detailed picture of the ethnic composition of the population and changes in the composition over time. The reason is that in most demographic and socio-economic analysis in Fiji, ethnicity emerges as a principal explanatory variable. Demographic examples include fertility, mortality and migration whereas socio-economic examples include health, labour force participation, employment, unemployment, occupation and many other variables. Consequently, virtually all data provided by the FBoS is cross-classified with the variable ethnicity.

Recently, it has been suggested that, in future, the variable ethnicity should be removed from all data collection and analysis in Fiji. However, ignoring this crucial variable will lead to far from optimal analysis and data utilization. It will affect evidence-based and target oriented planning in a very negative manner.

Fortunately the variable ethnicity was maintained on the 2007 Census Interview Schedule.[16] In the meantime, in many countries in the South Pacific Region, including Fiji, recording of ethnicity has become more difficult over time due to intermarriage and other factors. Reality in the 21st century is that the ethnicity of many respondents is mixed. In this respect, it is important to emphasize that in the data collection systems of the FBoS, ethnicity is always based on reports of the respondents themselves. In other words, respondents are what they say they are.

3.2. Population size and growth for the main ethnic groups

Table I-3 presents the change in the main ethnic components of the population (Fijians, Indians and Others) during all intercensal periods since 1946. This change is also portrayed in Figure I-1.

The main feature of this table and figure is the dramatic decline in the growth rate of the Indian component of the population after 1966. Until 1986, the main reason for the decline was the very vast decrease in the level of fertility of Indians. After 1986, emigration became, however an even more important contributor to the decrease in the Indian growth rate. As a result, during the last two decades, the Indian population has decreased very significantly, even in absolute terms.

It is somewhat surprising that, after 1996, the annual rate of growth of Fijians has hardly changed. It dropped only very marginally from 1.8 percent per year (between 1986 and 1996) to 1.7 percent per year (between 1996 and 2007). Since far more Fijians were outside the country in 2007 than in 1996 (and were therefore not included in the de-facto enumerations during these two censuses), a more significant decrease in the Fijian growth rate was expected.

[16] Moreover, this census included for the first time a question concerning “residency status”.

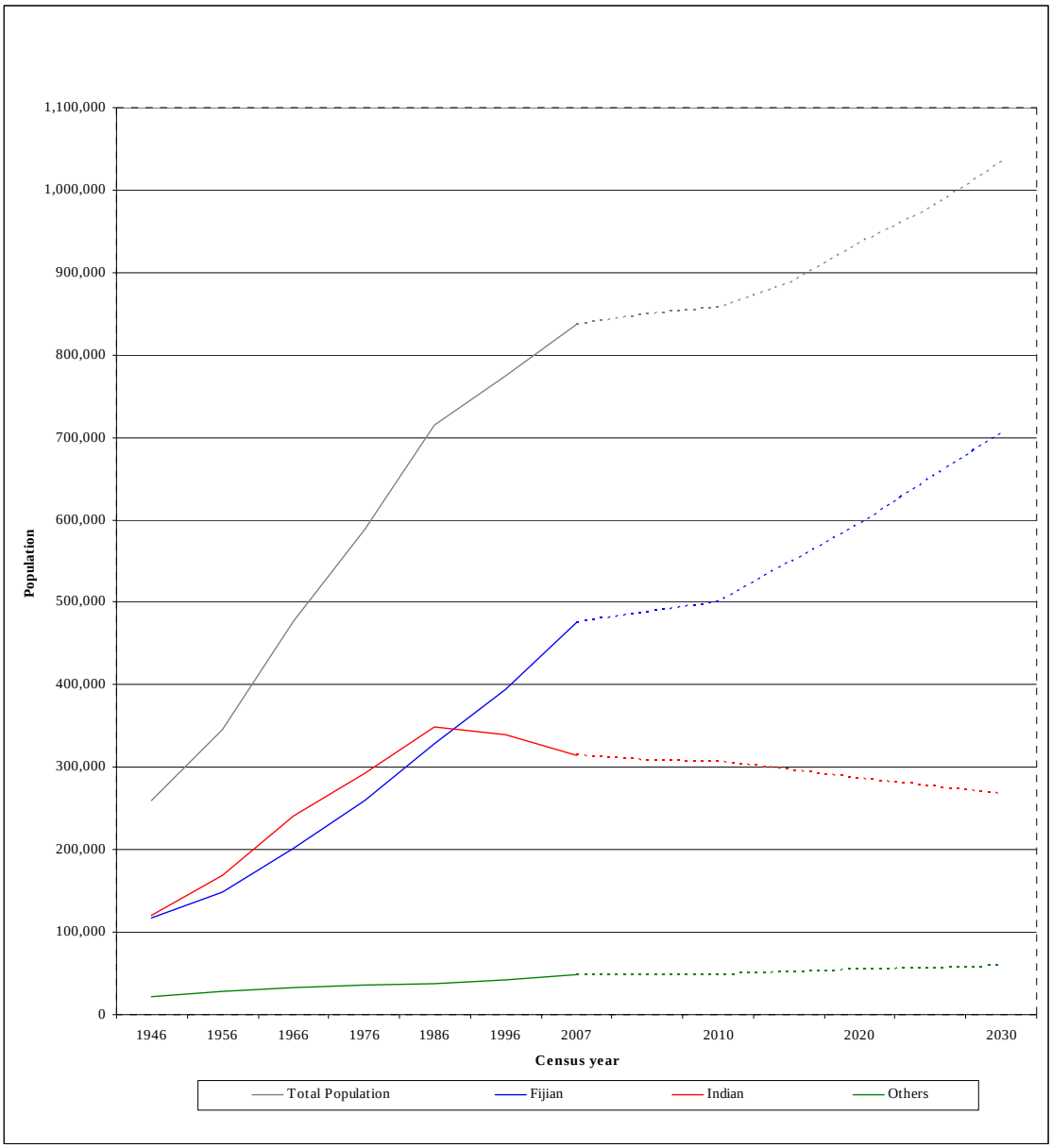
Table I-3: Size and growth of the main ethnic components of the population between 1946 and 2007

Interc. Period.		Census Population		Intercensal Pop. Change			Doubl Time (Yrs)@
P_1 (Yr)	P_2 (Yr)	P_1 (Nr)	P_2 (Nr)	Abs. (Nr)	Rel. (%)	r* (%)	
Total Population							
1946	**1956**	259,638	345,737	86,099	33.2	2.9	24
1956	**1966**	345,737	476,727	130,990	37.9	3.2	21
1966	**1976**	476,727	588,068	111,341	23.4	2.1	33
1976	**1986**	588,068	715,375	127,307	21.7	2.0	35
1986	**1996**	715,375	775,077	59,702	8.3	0.8	86
1996	**2007**	775,077	837,271	62,194	8.0	0.7	99
Fijian Component							
1946	**1956**	118,070	148,134	30,064	25.5	2.3	31
1956	**1966**	148,134	202,176	54,042	36.5	3.1	22
1966	**1976**	202,176	259,932	57,756	28.6	2.5	28
1976	**1986**	259,932	329,305	69,373	26.7	2.4	29
1986	**1996**	329,305	393,575	64,270	19.5	1.8	39
1996	**2007**	393,575	475,739	82,164	20.9	1.7	40
Indian Component							
1946	**1956**	120,414	169,403	48,989	40.7	3.4	20
1956	**1966**	169,403	240,960	71,557	42.2	3.5	20
1966	**1976**	240,960	292,896	51,936	21.6	2.0	36
1976	**1986**	292,896	348,704	55,808	19.1	1.8	40
1986	**1996**	348,704	338,818	-9,886	-2.8	-0.3	-241
1996	**2007**	338,818	313,801	-25,017	-7.4	-0.7	-100
Others							
1946	**1956**	21,154	28,200	7,046	33.3	2.9	24
1956	**1966**	28,200	33,591	5,391	19.1	1.8	39
1966	**1976**	33,591	35,240	1,649	4.9	0.5	145
1976	**1986**	35,240	37,366	2,126	6.0	0.6	118
1986	**1996**	37,366	42,684	5,318	14.2	1.3	52
1996	**2007**	42,684	47,731	5,047	11.8	1.0	69

Notes: * The annual rate of growth (r) has been calculated from the formula $r = \ln (P_2/P_1)/n$, where n is the length of the intercensal period (given in Table I).

@ The doubling time (d) has been calculated from the formula $d = \ln 2/r$. A minus sign means that this is a "halving" time.

Figure I-1: Population growth for the total population and its main ethnic components between 1946 and 2007 and projected until 2030 based on a "no-change" scenario.



Possible reasons why the 2007 Census suggests such a minor decrease in the growth rate of Fijians during the 1996-2007 intercensal period include:

- More complete coverage during the 2007 Census than during the 1996 Census

- Stagnation in the fertility transition of Fijians. In this connection, it should be mentioned that the Fijian fertility transition started much later and that the rate of decline was far more modest than that of the Indian component. Moreover, after 1986, there were some indications that the Fijian fertility transition might be leveling off. This conclusion is based on analysis of data from the National Health Information System (NHIS), in combination with 1996 Census data. This analysis suggests that the Total Fertility Rate (TFR) for Fijians only dropped from 3.6 in 1986 to 3.5 in 1996. It seems, however, that this stagnation in the fertility transition of Fijians was only of a temporary nature. The analysis in Chapter VIII suggests that, after 1996, the Fijian fertility transition probably got some new momentum.

- A combination of the above two factors.

In interpreting the present growth rates of Indians and Fijians, it should be kept in mind that it is very unlikely that change in mortality has had a very significant impact on the recent trend in their growth rates. Before 1986, all components of the population experienced significant mortality decrease. However, since that time, the mortality transition has first leveled off and then came almost to a standstill. The mortality analyses of the 2007 Census and NHIS data suggest that adult mortality may have increased again in recent years. Whatever the case may be it is very unlikely that recent mortality trends have had a significant impact on the 1996-2007 intercensal growth rates.

The ethnic components of the population in Figure I-1have been projected to 2030. These projections are based on a "no-change" scenario. This means that it is assumed that between the base year 2007 and the final year of the projections, 2030, the combined impact of fertility, mortality and migration and consequently the rate of growth of these populations will not change. Considering the drastic changes in the population growth rates in the past, especially in the case of the Indians, the "no-change" scenario is probably a very unlikely scenario even in the short term.

4. Population size and growth by geographic level

4.1. Geographic subdivisions in Fiji

Geographic levels in Fiji refer to the hierarchical framework of official geographic subdivisions in the country: divisions, provinces and tikinas (tikina vou). Apart from a small correction of the Ba-Ra provincial boundary, all these divisional, provincial and tikina vou boundaries remained unchanged since 1946.[17] The FBoS has further subdivided the tikinas into enumeration areas (EA). The EA is a purely statistical/census unit, which does not have any legal or administrative significance. The EAs make the geographical system flexible. It is possible to combine EAs to

[17] Since the 1956 Census, the tikina makawa has not been used anymore as a geographical subdivision for census/statistical purposes. The tikina makawa is basically a grouping of villages. In many cases, the tikina makawa has never been properly delineated and in other cases, especially in areas with extensive modern-type development, the precise boundaries of tikina makawas are not known anymore. This problem is particularly serious in the urbanized areas of the provinces in the Central Division.

form any kind of larger area that is required for planning or research purposes. It is the smallest geographical unit (building block) for which census information is made available.

4.2. Population size and growth for the divisions and provinces

Population change at the division and province level is presented in Table I-4.

Table I-4: Population size and growth by division and province during the 1986-1996 and 1996-2007 intercensal periods.

Geographic Level	Interc Period	Census Population		Intercensal Population Change		
		P_1 (Nr)	P_2 (Nr)	Abs (Nr)	Rel (%)	r (%)
Fiji	**86-96**	**715,375**	**775,077**	**59,702**	**8.4**	**0.8**
	96-07	**775,077**	**837,271**	**62,194**	**8.0**	**0.7**
Central Division						
Tot. Central Div.	**86-96**	260,110	297,607	37,497	14.4	1.3
	96-07	297,607	342,594	44,987	15.1	1.3
09: Naitasiri	**86-96**	100,227	126,641	26,414	26.4	2.3
	96-07	126,641	160,760	34,119	26.9	2.2
10: Namosi	**86-96**	4,836	5,742	906	18.7	1.7
	96-07	5,742	6,898	1,156	20.1	1.7
12: Rewa	**86-96**	97,442	101,547	4,105	4.2	0.4
	96-07	101,547	100,995	-552	-0.5	-0.1
13: Serua	**86-96**	13,356	15,461	2,105	15.8	1.5
	96-07	15,461	18,249	2,788	18.0	1.5
14: Tailevu	**86-96**	44,249	48,216	3,967	9.0	0.9
	96-07	48,216	55,692	7,476	15.5	1.3
Northern Division						
Tot. North. Div.	**86-96**	129,154	139,516	10,362	8.0	0.8
	96-07	139,516	135,961	-3,555	-2.6	-0.2
01: Bua	**86-96**	13,986	14,988	1,002	7.2	0.7
	96-07	14,988	14,176	-812	-5.4	-0.5
03: Cakaudrove	**86-96**	40,433	44,321	3,888	9.6	0.9
	96-07	44,321	49,344	5,023	11.3	1.0
07: Macuata	**86-96**	74,735	80,207	5,472	7.3	0.7
	96-07	80,207	72,441	-7,766	-9.7	-0.9

Eastern Division						
Tot. East. Div.	**86-96**	42,762	40,770	-1,992	-4.7	-0.5
	96-07	40,770	39,105	-1,665	-4.1	-0.4
04: Kadavu	**86-96**	9,805	9,535	-270	-2.8	-0.3
	96-07	9,535	10,167	632	6.6	0.6
05: Lau	**86-96**	14,203	12,211	-1,992	-14.0	-1.5
	96-07	12,211	10,683	-1,528	-12.5	-1.2
06: Lomaiviti	**86-96**	16,066	16,214	148	0.9	0.1
	96-07	16,214	16,253	39	0.2	0.0
15: Rotuma	**86-96**	2,688	2,810	122	4.5	0.4
	96-07	2,810	2,002	-808	-28.8	-3.1
Western Division						
Tot. West. Div.	**86-96**	283,349	297,184	13,835	4.9	0.5
	96-07	297,184	319,611	22,427	7.6	0.7
01: Ba	**86-96**	197,633	212,197	14,564	7.4	0.7
	96-07	212,197	231,760	19,563	9.2	0.8
08: Nadroga	**86-96**	54,431	54,083	-348	-0.6	-0.1
	96-07	54,083	58,387	4,304	8.0	0.7
11: Ra	**86-96**	31,285	30,904	-381	-1.2	-0.1
	96-07	30,904	29,464	-1,440	-4.7	-0.4

4.2.1. Central Division

Population growth for the different ethnic groups in the provinces of the Central Division has been detailed in Table I-5a.

As expected, during the 1996-2007 intercensal period, the Central Division is the only division where the population has increased at a rate higher than the national average of 0.7 percent. During this period, growth in this division has remained at the same level as during the previous intercensal period, viz. 1.3 percent per year, which is about double the national average rate. However, population growth within this division remains very uneven.

- Naitasiri Province

During the 1996-2007 intercensal period, about 76 percent of the population growth in the Central Division has occurred in Naitasiri Province. The growth in this province amounted to 55 percent of the total national growth. Furthermore, growth in this province is almost entirely (more than 95 percent) due to growth in just one of its tikinas. This is Naitasiri Tikina.

In order to put population change in Fiji during the most recent intercensal period 1996-2007 into perspective, it needs to be realized that more than 50 percent of the total intercensal growth for the entire country was due to growth in the urban sector of this tikina alone! This is a continuation of the trend that started already during the 1986-1996 intercensal period. It needs to be stressed that the urban sector of Naitasiri Tikina is one of the few places in Fiji, which still

experiences very significant growth of the Indian population. In the meantime, the growth of the Fijian population in the urban sector of this tikina has even increased at a much faster rate. Growth is to a large extent due to massive in-migration from other provinces.

It will also be noted that, in 2007, the population of Naitasiri Province is still significantly smaller than that of the most populous province, Ba. However, since the growth rate of the population of Naitasiri (2.2 percent annually) is much faster than that of Ba (0.8 percent annually), Naitasiri is catching up very fast. Continuation of present rates implies that Naitasiri would become the largest province 26 years after the 2007 Census, which is in 2033. Furthermore, it is clear that the urban sector of Naitasiri Tikina has now established itself as the growth center in the eastern part of Fiji. It is likely that in the foreseeable future most of the problems related to rapid urbanization will be concentrated here.

Table I-5a: Size and growth of the main ethnic components of the population in the provinces in the Central Division for the intercensal period 1996-2007

Geogr. Level	Ethnic Group	Census Population		Intercensal Population Change		
		1996 (Nr)	2007 (Nr)	Abs (Nr)	Rel (%)	r (%)
Central Div.	**Total**	**297,607**	**342,594**	**44,987**	**15.1**	**1.3**
	Fijian	**175,878**	**212,780**	**36,902**	**21.0**	**1.7**
	Indian	**98,660**	**103,134**	**4,474**	**4.5**	**0.4**
	Other	**23,069**	**26,680**	**3,611**	**15.7**	**1.3**
09: Naitasiri	**Total**	126,641	160,760	34,119	26.9	2.2
	Fijian	70,837	93,124	22,287	31.5	2.5
	Indian	49,023	58,496	9,473	19.3	1.6
	Other	6,781	9,140	2,359	34.8	2.7
10: Namosi	**Total**	5,742	6,898	1,156	20.1	1.7
	Fijian	5,221	6,159	938	18.0	1.5
	Indian	411	514	103	25.1	2.0
	Other	110	225	115	104.6	6.5
12: Rewa	**Total**	101,547	100,995	-552	-0.5	-0.1
	Fijian	58,893	62,173	3,280	5.6	0.5
	Indian	28,330	24,082	-4,248	-15.0	-1.5
	Other	14,324	14,740	416	2.9	0.3
13: Serua	**Total**	15,461	18,249	2,788	18.0	1.5
	Fijian	8,465	11,138	2,673	31.6	2.5
	Indian	6,003	5,830	-173	-2.9	-0.3
	Other	993	1,281	288	29.0	2.3
14: Tailevu	**Total**	48,216	55,692	7,476	15.5	1.3
	Fijian	32,462	40,186	7,724	23.8	1.9
	Indian	14,893	14,212	-681	-4.6	-0.4
	Other	861	1,294	433	50.3	3.7

- Rewa Province

  In contrast to Naitasiri Province, population growth during the 1996-2007 intercensal period in Rewa province has now become negative. As in the case of Naitasiri, changes in Rewa Province are once again largely due to changes in the urban sector of one tikina, viz. Suva Tikina. During the 1996-2007 intercensal period, the population in the urban sector of this tikina (mainly Suva City) has actually decreased. The very significant loss of Indians has only partially been compensated by gains for the Fijians. For the immediate future, no significant change in this trend is expected.

- Namosi, Serua and Tailevu Provinces

  During the 1996-2007 intercensal period, the population of the remaining provinces of the Central Division, viz. Namosi, Serua and Tailevu continued to grow at a rate that is significantly higher than the national average but at a much lower rate than that of the population of Naitasiri. Moreover, the population of these provinces, particularly Namosi and Serua is only very small compared to that of Naitasiri and Rewa. Growth in Namosi Province is probably mainly due to natural increase. A large proportion of the mainly Fijian population of this province is Roman Catholic and their level of fertility is higher than the national average for Fijians.

4.2.2. Eastern Division

Population growth for the different ethnic groups in the provinces of the Eastern Division has been detailed in Table I-5b.

Table I-5b: Growth of the main ethnic components of the population in the provinces in the Eastern Division during the intercensal period 1996-2007

Geogr. Level	Ethnic Group	Census Population		Intercensal Population Change		
		1996 (Nr)	2007 (Nr)	Abs (Nr)	Rel (%)	r (%)
Eastern Div.	**Total**	**40,770**	**39,105**	**-1,665**	**-4.1**	**-0.4**
	Fijian	**36,302**	**35,415**	**-887**	**-2.4**	**-0.2**
	Indian	**695**	**651**	**-44**	**-6.3**	**-0.6**
	Other	**3,773**	**3,039**	**-734**	**-19.5**	**-2.0**
04: Kadavu	**Total**	9,535	10,167	632	6.6	0.6
	Fijian	9,413	9,964	551	5.9	0.5
	Indian	48	49	1	2.1	0.2
	Other	74	154	80	108.1	6.6
05: Lau	**Total**	12,211	10,683	-1,528	-12.5	-1.2
	Fijian	12,002	10,540	-1,462	-12.2	-1.2
	Indian	88	88	0	0.0	0.0
	Other	121	55	-66	-54.6	-7.1

06: Lomaiviti	**Total**	16,214	16,253	39	0.2	0.0
	Fijian	14,719	14,822	103	0.7	0.1
	Indian	536	494	-42	-7.8	-0.7
	Other	959	937	-22	-2.3	-0.2
15: Rotuma	**Total**	2,810	2,002	-808	-28.8	-3.1
	Fijian	168	89	-79	-47.0	-5.7
	Indian	23	20	-3	-13.0	-1.3
	Other	2,619	1,893	-726	-27.7	-2.9

In 2007, the population of the four provinces that comprise the Eastern Division was only 4.7 percent of the total population of Fiji. During the 1996-2007 intercensal period, population decrease in the Eastern Division has continued, but this is mainly due to further very significant out-migration of Fijians from Lau Province and of Rotumans from Rotuma. During this intercensal period, Lau Province lost another 1,528 persons, which is about 13 percent of its 1996 population. The population of Rotuma has also decreased by an additional 808 persons. However, in the case of this province, it should be kept in mind that the 1996 figure for this province is somewhat inflated since participants of the Catholic Church Conference in Rotuma at the time of that census were included in the de-facto figures for Rotuma. The population of Kadavu and Lomaiviti increased marginally during the intercensal period.

4.2.2. Northern Division

Population growth for the different ethnic groups in the provinces of the Northern Division is detailed in Table I-5c.

Table I-5c: Growth of the main ethnic components of the population in the provinces in the Northern Division during the intercensal period 1996-2007

Geogr. Level	Ethnic Group	Census Population		Intercensal Population Change		
		1996 (Nr)	2007 (Nr)	Abs (Nr)	Rel (%)	r (%)
Northern Div.	**Total**	**139,516**	**135,961**	**-3,555**	**-2.6**	**-0.2**
	Fijian	64,940	75,358	10,418	16.0	1.4
	Indian	66,488	52,846	-13,642	-20.5	-2.1
	Other	8,088	7,757	-331	-4.1	-3.8
01: Bua	**Total**	14,988	14,176	-812	-5.4	-0.5
	Fijian	10,992	11,183	191	1.7	0.2
	Indian	3,356	2,367	-989	-29.5	-3.2
	Other	640	626	-14	-2.2	-0.2
03: Cakaudrove	**Total**	44,321	49,344	5,023	11.3	1.0
	Fijian	31,585	35,978	4,393	13.9	1.2
	Indian	6,838	7,929	1,091	16.0	1.3
	Other	5,898	5,437	-461	-7.8	-0.7

07: Macuata	**Total**	80,207	72,441	-7,766	-9.7	-0.9
	Fijian	22,363	28,197	5,834	26.1	2.1
	Indian	56,294	42,550	-13,744	-24.4	-2.5
	Other	1,550	1,694	144	9.3	0.8

- Macuata Province

  Population decrease in the Northern Division is almost entirely due to losses in Macuata Province. This province lost 7,766 persons, which is almost 10 percent of its 1996 population. Within this province, losses were mainly in Labasa, Macuata and Sasa Tikina.

  During the 1996-2007 intercensal period, Labasa Tikina lost about 8 percent of its 1996 population. However, it is the change in the composition of the population of this tikina, which is even more significant. During the intercensal period, a very large number of Indians left Labasa Tikina. Of these, more than 90 percent were rural dwellers. Although at this stage, it is not yet possible to establish the destination of all these out-migrants, it seems that significant proportions have either emigrated or moved to the urban sector of Naitasiri Tikina (the UAs of Nasinu and Nausori). Others have moved to the UA Savusavu.

  All these Indian out-migrants from Labasa Tikina have partially been replaced by Fijian in-migrants. However most of these Fijian in-migrants moved to the urban sector of this tikina, that is the UA of Labasa. The implications of this for the sugar cane sector as well as overall development in Macuata Province are clearly very important not least from the socio-economic point of view.

  In addition to the exodus of Indians from the rural sector of Labasa Tikina, a very large number of Indians have also left the rural sector of Macuata Tikina. Contrary to the situation in Labasa Tikina, Indians in this tikina have, however not (partially) been replaced by Fijian rural-urban migrants. It will be noted that the urban sector of Macuata Tikina (the unincorporated township of Seaqaqa) is very small.

  Rural Sasa Tikina also lost a large proportion of its Indian population. Moreover, a large number of Fijians also left this tikina. All in all, during the 1996-2007 intercensal period, this tikina lost more than 30 percent of its population.

  In 2007, Macuata Province is (apart from Ba Province) still a province with a predominantly Indian population. However, during the 1996-2007-intercensal period, the ethnic composition in this province has changed dramatically. In 1996, Indians still comprised 70 percent of the population of this province but in 2007, this had been reduced to 59 percent. Given continuation of present trends, the Fijian population of Macuata will surpass the Indian population by 2016.

- Cakaudrove Province

  Contrary to Macuata Province, Cakaudrove Province is a predominantly Fijian Province. Population growth in this province during the 1996-2007 intercensal period remained almost the same as during the previous intercensal period, viz. 1.0 percent per annum. The population of most tikinas in this province is relatively small. Most of the intercensal growth in this province occurred in the three largest tikinas, Cakaudrove, Nasavusavu (including the Savusavu Urban Area) and Wailevu. During this period, most of the other tikinas experienced marginal population growth or some loss.

- Bua Province

  During the 1996-2007 intercensal period, Bua Province has also remained an out-migration Province. The loss of Indians was 990 persons, in other words, about 30 percent of the 1996 Indian population left the province.

Finally, during the intercensal period 1996-2007, the Northern Division as a whole has joined the Eastern Division as a division of out-migration. It has become a division with a negative population growth rate. Furthermore, the category of emigrants and out-migrants from the Northern Division consists mainly of Indians. In fact, population losses for this division would have been far more dramatic, if it had not been for the fact that the growth of the Fijian component in this division is still high. Judging from the 2007 Census data for this division, Fiji's "Looking North Policy" is clearly not yet much more than just a policy.

4.2.3. Western Division

Population growth for the different ethnic groups in the provinces of the Western Division is detailed in Table I-5d. During the 1996-2007 intercensal period, the population of the Western Division was growing at the national average rate of 0.7 percent.

Table I-5d: Growth of the main ethnic components of the population in the provinces in the Western Division during the intercensal period 1996-2007

Geogr. Level	Ethnic Group	Census Population		Intercensal Population Change		
		1996 (Nr)	2007 (Nr)	Abs (Nr)	Rel (%)	r (%)
Western Div.	**Total**	**297,184**	**319,611**	**22,427**	**7.6**	**0.7**
	Fijian	116,455	152,186	35,731	30.7	2.4
	Indian	172,975	157,170	-15,805	-9.1	-0.9
	Other	7,754	10,255	2.501	32.3	2.5
01: Ba	**Total**	212,197	231,760	19,563	9.2	0.8
	Fijian	69,902	96,852	26,950	38.6	2.9
	Indian	135,492	126,142	-9,350	-6.9	-0.7
	Other	6,803	8,766	1,963	28.9	2.3

08: Nadroga	**Total**	54,083	58,387	4,304	8.0	0.7
	Fijian	28,180	35,075	6,895	24.5	2.0
	Indian	25,244	22,140	-3,104	-12.3	-1.2
	Other	659	1,172	513	77.9	5.2
11: Ra	**Total**	30,904	29,464	-1,440	-4.7	-0.4
	Fijian	18,373	20,259	1,886	10.3	0.9
	Indian	12,239	8,888	-3,351	-27.4	-2.9
	Other	292	317	25	8.6	0.7

- Ba Province

  In spite of the very significant decrease in its Indian population, the total population of Ba Province is still growing at a rate close to the national average. This is due to the very fast increase of its Fijian population. About 87 percent of growth in the Western Division occurred in Ba Province. As in the case of Naitasiri Province, this growth is highly localized. It is due to the dramatic increase of the Fijian population in the urban sector of Nadi, Nawaka and Vuda Tikina (the Nadi and Lautoka UAs). Growth of the Indian population in these tikinas, with the exception of the urban sector of Nadi Tikina is now close to nil.

  In the meantime, Ba Tikina experienced a very significant decrease in its rural Indian population and the same applies to Tavua Tikina.

  In spite of the massive emigration of Indians, Ba remains, in 2007, the province with by far the largest population in Fiji. However, as already mentioned, given continuation of present trends, the population of Ba will be surpassed by that of Naitasiri in 2033.

  As in the case of Macuata Province, changes in the population of Ba Province have altered the ethnic composition dramatically. In 1996, there were still 94 percent more Indians than Fijians in this province but in 2007, this had been reduced to only 30 percent. Given continuation of the present growth rates of Fijians and Indians implies that the Fijian population will overtake the Indian population in 2014.

- Nadroga/Navosa Province

  During the 1996-2007 intercensal period, the population of Nadroga/Navosa Province also increased at about the national average. As in the case of Ba Province, its Indian population decreased very significantly but this was cancelled out by a large increase in the Fijian population. The substantial increase in the category “Others” is probably related to the relative abundance of Coral Coast freehold leases.

- Ra Province

  During the 1996-2007 intercensal period, the population of Ra Province continued to decrease but at a faster rate than during the 1986-1996 intercensal period. Losses for the Indian component, many as a result of expired leases, were very significant.

5. Population size and growth by geographic sector

5.1 Geographic sectors in Fiji

Like most countries, Fiji is subdivided into a rural and an urban sector. However, countries differ greatly in their definition of what is considered as "urban". Prior to the 1966 Census, statistical boundaries for all urban areas in Fiji were for the first time officially delineated. Subsequently, before the 1976 Census, these urban boundaries were reviewed and adapted. Unfortunately, no urban boundary revision was carried out before the 1986 Census. During the twenty-year period between 1976 and 1996, many developments in the public and private sector occurred and these have affected the rural-urban divide very significantly. Consequently, the 1996 Census was preceded by a major revision of all urban boundaries. This comprehensive revision was based on a set of five statistical criteria.[18] Prior to the 2007 Census, the boundaries of some UAs areas have again been revised. The revision was once again based on the same five criteria as in 1996.

It is important to note that studies of rural-urban migration, urbanization, urban growth etc. should be based on the census/statistical urban areas and not on the official cities and towns. The reason is that the delineation of these cities and towns is not based on statistical criteria.

5.2. Population size and growth for the rural and urban sector

Table I-6 provides an overview of population change for the rural and urban sector during the intercensal periods 1986-1996 and 1996-2007. It will be noted that, in 2007, the urban population has surpassed the rural population for the first time.

Table I-6: Population size and growth by geographic sector for the 1986-1996 and 1996-2007 intercensal periods.

Interc. Period	Geogr Sector	Census Population		Intercensal Population Change			Doubl. Time (Yrs)
		P_1 (Nr)	P_2 (Nr)	Abs (Nr)	Rel (%)	r (%)	
86-96	**All**	715,375	775,077	59,702	8.3	0.8	86
	Rural	438,350	415,582	-22,768	-5.2	-0.5	-130
	Urban	277,025	359,495	82,470	29.8	2.6	27
96-07	**All**	775,077	837,271	62,194	8.0	0.7	99
	Rural	415,582	412,410	-3,172	-0.8	-0.1	-1,001
	Urban	359,495	424,861	65,366	18.2	1.5	46

During the 1996-2007 intercensal period, the population of the rural sector has continued to decrease, albeit at a somewhat more moderate pace than during the previous intercensal period 1986-1996. The opposite has happened for the urban sector: its population has continued to

[18] FBoS, 1997

increase. Once again, the increase between 1996 and 2007 has been somewhat lower than during the previous intercensal period. In interpreting these changes, it should be kept in mind that the somewhat lower rate of decrease for the rural and the somewhat lower rate of increase for the urban sector during the 1996-2007 intercensal period as compared to the previous intercensal period 1986-1996, is largely the result of the very substantial revision of several urban boundaries prior to the 1996 Census. As a result of the UA boundary extensions, a large part of the decrease in the rural population and increase in the urban population between 1986 and 1996 is not due to natural increase and rural-urban migration but to the incorporation of formerly rural areas into the urban sector.

In comparison to the UA boundary revision prior to the 1996 Census, the revision carried out before the 2007 Census was relatively modest. Prior to this census, only the urban area boundaries of Nadi and Lautoka required extension.

6. **Population size and growth for urban areas**

6.1 Urban Areas and their subdivisions in Fiji

At the time of the 1996 Census, Fiji had eighteen urban areas (UA). Eleven of these were UAs of the first category. These UAs consist of an incorporated (gazetted) city/town and a peri-urban area that surrounds it. The eleven UAs of the first category included Suva, Lautoka, Lami, Nausori, Nadi, Ba, Tavua, Sigatoka, Labasa, Savusavu and Levuka. It will be noted that two of these UAs included an incorporated (gazetted) city, i.e. Suva and Lautoka. The remaining nine UAs included an incorporated (gazetted) town. All cities and towns are further subdivided into wards.

After 1996, the main change in the above picture was the incorporation of another town, viz. Nasinu. As noted before, the entire urban area of Nasinu (NasinuTown as well as its peri-urban area) has been carved out of the peri-urban area of Suva. This brings the total number of UAs of the first category in 2007 to twelve.

In addition, prior to the 2007 Census, the urban boundary of Lautoka and Nadi has also been extended. Finally, during this period, some town boundaries were also adjusted. This applies first and foremost to the town boundary of Nadi. More recently, the town boundary of Labasa has also slightly been extended to the west.

Apart from the above UAs of the first category, there were, at the time of the 1996 Census, seven UAs of the second category. These UAs do not include an incorporated (gazetted) town. The UAs in this category are UAs for census/statistical purposes only. They are also referred to as unincorporated towns. In 1996, this second category included the UAs (unincorporated towns) Vatukoula, Rakiraki, Korovou, Navua, Pacific Harbor, Nabouwalu and Seaqaqa.[19] During the 2007 Census, the boundaries of all these unincorporated towns were the same as during the 1996 Census. Moreover, after 1996, the FBoS has not created any new UA of the second category.

[19] During the years prior to the 2007 Census, it was considered to incorporate Rakiraki. This finally happened after the 2007 Census.

6.2. Population size and growth for urban areas and their subdivisions

Table I-7 presents population change during the 1996-2007 intercensal period for the UAs of the first and second category, as well as for the subdivisions (incorporated city/town and peri-urban area) of the first category.

It appears that during the 1996-2007-intercensal period, the total population residing in an UA of the first category has increased dramatically, whereas the total population residing in an UA of the second category has hardly changed at all. It will, however be noted that the dramatic increase for UAs of the first category during the intercensal period is entirely due to increase in the total city/town population by 104,681 persons which corresponds with an average increase of 4.6 percent per annum.

During the intercensal period, the total population residing in peri-urban areas decreased by 39,475persons, which constitutes an average decrease of -2.2 percent per annum. The main reason for these drastic changes is obvious. During the 1996-2007 intercensal period, Nasinu Town has been incorporated. At the time of the 2007 Census, this was a town with 76,064 inhabitants. This accounts for 76 percent of the total intercensal increase in the city/town population. Prior to the incorporation of Nasinu, the inhabitants of NasinuTown were part of the peri-urban population of Suva.

Table I-7: Population size and growth for the urban sector and its subdivisions for the 1986-1996 and 1996-2007 intercensal periods.

Urban Area (UA)	Interc. Period	Census Population		Intercensal Population Change			Doubl Time (yrs)
		P_1 (Nr)	P_2 (Nr)	Abs (Nr)	Rel (%)	R (%)	
All UAs (Total urban sector)	**86-96**	**277,025**	**359,495**	**82,470**	**29.7**	**2.6**	**27**
	96-07	**359,495**	**424,861**	**65,366**	**18.2**	**1.5**	**46**
1. All UAs of the 1st category	**86-96**	265,760	340,486	74,726	28.1	2.5	28
	96-07	340,486	405,692	65,206	19.2	1.6	44
-Incorporated cities/towns	**86-96**	136,755	158,352	21,597	15.8	1.5	47
	96-07	158,352	263,033	104,681	66.1	4.6	15
-Peri-urban areas	**86-96**	129,005	182,134	53,129	41.2	3.5	20
	96-07	182,134	142,659	-39,475	-21.7	-2.2	-31
2. All UAs of the 2nd category	**86-96**	11,265	19,009	7,744	68.7	5.2	13
	96-07	19,009	19,169	160	0.8	0.1	915

6.2.1. Urban Areas of the 1st category and their subdivisions

Table I-8 homes in on population change during the intercensal periods 1986-1996 and 1996-2007 for the twelve individual UAs of the first category. It will be noted that these twelve UAs have been listed in alphabetical order and not by province or by size.

The information in Table I-9 supplements that of Table I-8. It takes the analysis one step further since it also looks at population change for the subdivisions (incorporated city/town and peri-urban area) of the twelve UAs of the first category. However, this analysis is limited to the most recent intercensal period 1996-2007.

As during the previous intercensal period 1986-1996, it appears that during the 1996-2007 intercensal period, growth of individual UAs has continued to be very unequal. Firstly, the enormous decrease in the population of the UA Suva is almost entirely due to the fact that this city lost almost its entire peri-urban area when Nasinu Town was carved out of its peri-urban area. As a result, the UA Suva has lost its position as the largest UA area in Fiji to Nasinu. Even more significant is that Suva City has a smaller population than NasinuTown. We now have the rather odd situation that the largest incorporated place in Fiji is not a city but a town and that the second city in Fiji, Lautoka has a population that is only 57 percent of that of Nasinu Town. Having said this, there are reasons why Nasinu has not yet been considered as a city. The promotion of a town to city status should also be based on several other criteria than just population size.

During the 1996-2007 intercensal period, the urban sector as a whole has been growing at an average rate of 1.6 percent per year. Of the urban areas that already existed in 1996, growth in the urban area of Nausori has been by far the fastest, viz. at an average intercensal rate of 7.1 percent per year. By far the largest proportion of this growth (74 percent) occurred in Nausori Town. However, it must be stressed that most of this growth is not due to rural-urban migration but to incorporation. During the 1996-2007 intercensal period, the town as well as the urban area boundary of urban Nausori has been extended very drastically, once again at the expense of the Suva peri-urban area. The Nausori UA now includes Nakasi, Davuilevu Housing Estate and Wainibuku.

Table I-8: Population size and growth for urban areas of the first category (those with an incorporated city/town) for the 1986-1996 and 1996-2007 intercensal periods.

Urban Area	Interc. Period	Census Population		Intercensal Population Change			Doubl. Time (yrs)
		P1 (Nr)	P2 (Nr)	Abs. (Nr)	Rel. (%)	r (%)	
Total	**86-96**	**265,760**	**340,486**	**74,726**	**28.1**	**2.5**	**28**
	96-07	**340,486**	**405,692**	**65,206**	**19.2**	**1.6**	**44**
Ba	**86-96**	10,260	14,716	4,456	43.4	3.6	19
	96-07	14,716	18,526	3,810	25.9	2.1	33
Labasa	**86-96**	16,537	24,095	7,558	45.7	3.8	18
	96-07	24,095	27,949	3,854	16.0	1.3	52
Lami	**86-96**	16,707	18,928	2,221	13.3	1.3	55
	96-07	18,928	20,529	1,601	8.5	0.7	94
Lautoka	**86-96**	39,057	43,274	4,217	10.8	1.0	68
	96-07	43,274	52,220	8,946	20.7	1.7	41
Levuka	**86-96**	2,895	3,746	851	29.4	2.6	27
	96-07	3,746	4,397	651	17.4	1.5	48
Nadi	**86-96**	15,220	30,884	15,664	102.9	7.1	10
	96-07	30,884	42,286	11,402	36.9	2.8	24
Nasinu	**86-96**	-	-	-	-	-	-
	96-07	-	87,446	87,446	-	-	-
Nausori	**86-96**	13,982	21,617	7,635	54.6	4.4	16
	96-07	21,617	47,604	25,987	120.2	7.1	10
Savusavu	**86-96**	2,872	4,970	2,098	73.1	5.5	13
	96-07	4,970	7,034	2,064	41.5	3.1	22
Sigatoka	**86-96**	4,730	7,862	3,132	66.2	5.1	14
	96-07	7,862	9,622	1,760	22.4	1.8	38
Suva	**86-96**	141,273	167,975	26,702	18.9	1.7	40
	96-07	167,975	85,691	-82,284	-49.0	-6.1	-11
Tavua	**86-96**	2,227	2,419	192	8.6	0.8	84
	96-07	2,419	2,388	-31	-1.3	-0.1	-594

Table I-9: Population size and growth for individual urban areas of the first category and their subdivisions for the 1996-2007 intercensal period.

Urban Area	Subdiv. of Urban Area	Census Population		Intercensal Population Change			Doubl. Time (yrs)
		1996 (Nr)	2007 (Nr)	Abs. (Nr)	Rel. (%)	r (%)	
Total	**All**	**340,486**	**405,692**	**65,206**	**19.2**	**1.6**	**44**
	City/Town	**158,352**	**263,033**	**104,681**	**66.1**	**4.6**	**15**
	Peri-Urban	**182,134**	**142,659**	**-39,475**	**-21.7**	**-2.2**	**-31**
Ba	**All**	14,716	18,526	3,810	25.9	2.1	33
	Town	6,314	6,826	512	8.1	0.7	98
	Peri-Urban	8,402	11,700	3,298	39.3	3.0	23
Labasa	**All**	24,095	27,949	3,854	16.0	1.3	52
	Town	6,491	7,706	1,215	18.7	1.6	45
	Peri-Urban	17,604	20,243	2,639	15.0	1.3	55
Lami	**All**	18,928	20,529	1,601	8.5	0.7	94
	Town	10,556	10,752	196	1.9	0.2	417
	Peri-Urban	8,372	9,777	1,405	16.8	1.4	49
Lautoka	**All**	43,274	52,220	8,946	20.7	1.7	41
	City	36,083	43,473	7,390	20.5	1.7	41
	Peri-Urban	7,191	8,747	1,556	21.6	1.8	39
Levuka	**All**	3,746	4,397	651	17.4	1.5	48
	Town	1,096	1,131	35	3.2	0.3	244
	Peri-Urban	2,650	3,266	616	23.3	1.9	37
Nadi	**All**	30,884	42,286	11,402	36.9	2.8	24
	Town	9,170	11,683	2,513	27.4	2.2	32
	Peri-Urban	21,714	30,603	8,889	40.9	3.1	22
Nasinu	**All**	-	87,446	87,446	-	-	-
	Town	-	76,064	76,064	-	-	-
	Peri-Urban	-	11,382	11,382	-	-	-
Nausori	**All**	21,617	47,604	25,987	120.2	7.1	10
	Town	5,744	24,919	19,175	333.8	13.3	5
	Peri-Urban	15,873	22,685	6,812	42.9	3.2	21
Savusavu	**All**	4,970	7,034	2,064	41.5	3.1	22
	Town	2,652	3,285	633	23.9	1.9	36
	Peri-Urban	2,318	3,749	1,431	61.7	4.4	16
Sigatoka	**All**	7,862	9,622	1,760	22.4	1.8	38
	Town	1,597	1,634	37	2.3	0.2	335
	Peri-Urban	6,265	7,988	1,723	27.5	2.2	32
Suva	**All**	167,975	85,691	-82,284	-49.0	-6.1	-11
	City	77,366	74,481	-2,885	-3.7	-0.3	-202
	Peri-Urban	90,609	11,210	-79,399	-87.6	-18.9	-4
Tavua	**All**	2,419	2,388	-31	-1.3	-0.1	-594
	Town	1,283	1,079	-204	-15.9	-1.6	-44
	Peri-Urban	1,136	1,309	173	15.2	1.3	54

During the 1996-2007 intercensal period, the Nadi UA also continued to experience rapid growth at a rate of 2.8 percent per year. However, contrary to the case of Nausori, growth in Nadi mainly (about 78 percent) occurred in its peri-urban area. Much of this growth is due to in-migration of Fijians.

Savusavu, experienced an average intercensal growth rate of 3.1 percent per year and almost 70 percent of this growth occurred in its per-urban area. Growth in the Savusavu UA is, however far more ethnically balanced than in the case of Nadi.

Intercensal growth of the population of the UAs Lautoka, Sigatoka and Ba continued at a rate slightly above the national average rate for the urban sector.

Growth in the urban areas of Lami has been at a much lower rate than that for the entire urban sector. At first sight, the stagnation in the population growth rate of the Lami UA comes as a bit of a surprise. Furthermore, whatever growth has occurred in this UA, is almost entirely due to growth in its peri-urban area (88 percent). The population of Lami Town has hardly changed during the 1996-2007 intercensal period. The question that needs to be answered is why the UA Lami hardly contributes to the rapid population growth of the Lami-Suva-Nasinu-Nausori corridor or in other words, why it is that growth in this corridor is almost entirely restricted to the area north of Suva City and not to the area west of Suva City. One important factor is clearly lack of space. Due to the mountainous character of the Lami hinterland, there is relatively little scope for further inland extension. Moreover, the possibilities for the development of low-cost housing areas are also limited. However, it is unlikely that this is the entire explanation for the relative stagnation of the UA Lami.

As already mentioned, during the 1996-2007-intercensal period, the main looser has been the UA Suva. During this period, this UA lost 50 percent of its population (and 88 percent of its peri-urban population) to Nasinu and Nausori. Apart from Suva, the only UA with a decreasing population is the very small UA Tavua.

Not only growth but also the structure of the UAs of the 1st category in Fiji is very different. More precisely, the variation in the ratio town population to peri-urban population is extreme. On the one hand, some UAs have a peri-urban population that is many times larger than its town population. UAs that include a town with rather conservative boundaries include Sigatoka, Labasa, Levuka and Nadi.

The Nadi UA is easily the most “unbalanced” UA in Fiji. Right from its inception, Nadi Town has had a very conservative boundary. During the 1996-2007 intercensal period, this town boundary has finally been extended somewhat. This boundary extension was long overdue. More importantly, it has done little to rectify the unbalanced structure of this UA. In 2007, Nadi’s peri-urban population still accounts for 72 percent of the total UA population. A very large proportion of the population of the peri-urban area is Fijian. They reside in one of the many “urban villages” that are included in the UA Nadi. The developmental (including the health) implications of a continuation of this undesirable situation have been discussed for more than 30 years. It remains unlikely that a change of status of the urban villages will be considered any time soon.

On the other hand, some UAs mainly consist of its incorporated city/town and their peri-urban population is only a small fraction of the city/town population. This applies first and foremost to the three largest urban areas of Fiji viz. Nasinu, Suva and Lautoka. In all three cases, the city/town population is far more than 80 percent of the total urban area population.

6.2.2. Urban Areas of the 2nd category

Table I-10 details population change during the intercensal periods 1986-1996 and 1996-2007, for the seven UAs of the second category. As already mentioned, these townships have not (yet) been incorporated, but they are considered as urban areas for census (statistical) purposes.

Table I-10: Population growth for unincorporated towns (urban areas for census purposes) for the 1986-1996 and 1996-2007 intercensal periods.

Urban Area	Interc. Period	Census Population		Intercensal Population Change			Doubl. Time (Yrs)
		P1 (Nr)	P2 (Nr)	Abs. (Nr)	Rel. (%)	r (%)	
Total	**86-96**	**11,265**	**19,009**	**7,744**	**68.7**	**5.2**	**13**
	96-07	**19,009**	**19,169**	**160**	**0.8**	**0.1**	**915**
Korovou	**86-96**	340	318	-22	-6.5	-0,7	-103
	96-07	318	349	31	9.8	0.8	82
Nabouwalu	**86-96**	-	592	592	-	-	-
	96-07	592	592	0	0.0	0.0	-
Navua	**86-96**	2,775	4,183	1,408	50.7	4.1	17
	96-07	4,183	5,048	865	20.7	1.7	41
Pacific Harbor	**86-96**	-	1,607	1,607	-	-	-
	96-07	1,607	1,819	212	13.2	1.1	62
Rakiraki*	**86-96**	3,361	4,836	1,475	43.9	3.6	19
	96-07	4,836	4,965	129	2.7	0.2	291
Seaqaqa	**86-96**	-	394	394	-	-	-
	96-07	394	816	422	107.1	6.6	11
Vatukoula	**86-96**	4,789	7,079	2,290	47.8	3.9	18
	96-07	7,079	5,580	-1,499	-21.2	-2.2	-32

Note * The unincorporated township of Rakiraki was incorporated after the 2007 Census

During the 1996-2007 intercensal period, population growth in most of these unincorporated townships has been minimal. One of them, Vatukoula, actually experienced a significant population loss due to the problems associated with the Emperor Gold Mine. Navua, which, prior to the 1996 Census, was already considered for incorporation, but still maintains its unincorporated status, experienced some growth. Growth in the UA of Rakiraki has come to a

standstill.[20] The only UA in this category that has grown at a rate that is higher than the national average rate for the urban sector is the small UA of Seaqaqa.

7. Population density

Population density is defined as the number of persons per km^2. The denominator of this index includes all land irrespective of its land use capability. This index is therefore referred to as "crude" population density. Crude population densities in 2007 at the national, divisional and provincial level are shown in Table I-10.Table I-10 also shows which percentage of the total land area of Fiji and which percentage of its total population can be found in each of the divisions and provinces.

Table I-11: Population, land area and population density in 2007 by division and province

Division/ Province	Location in Fiji	Land Area [km^2]	Population 2007	Population Density	% of Total Land Area	% of Total Population
Total Fiji	**-**	**18,272**	**837,271**	**46**	**100.0**	**100.0**
Western Div	**Viti Levu**	**6,360**	**319,611**	**50**	**34.8**	**38.2**
01: Ba	Viti Levu	2,634	231,760	88	14.4	27.7
08: Nadroga	Viti Levu	2,385	58,387	24	13.1	7.0
11: Ra	Viti Levu	1,341	29,464	22	7.3	3.5
Central Div	**Viti Levu**	**4,293**	**342,386**	**80**	**23.5**	**40.9**
09: Naitasiri	Viti Levu	1,666	160,760	96	9.1	19.2
10: Namosi	Viti Levu	570	6,898	12	3.1	0.8
12: Rewa	Viti Levu	272	100,787	371	1.5	12.0
13: Serua	Viti Levu	830	18,249	22	4.5	2.2
14: Tailevu	Viti Levu	955	55,692	58	5.2	6.7
Northern Div	**Vanua Levu**	**6,198**	**135,961**	**22**	**33.9**	**16.2**
02: Bua	Vanua Levu	1,378	14,176	10	7.5	1.7
03: Cakaudrove	Vanua Levu	2,816	49,344	18	15.4	5.9
07: Macuata	Vanua Levu	2,004	72,441	36	11.0	8.7
Eastern Div	**Outlying Is**	**1,422**	**39,313**	**28**	**7.8**	**4.7**
04: Kadavu	Outlying Is	478	10,167	21	2.6	1.2
05: Lau	Outlying Is	487	10,683	22	2.7	1.3
06: Lomaiviti	Outlying Is	411	16,461	40	2.2	2.0
15: Rotuma	Outlying Is	46	2,002	44	0.3	0.2

[20] In the meantime (after the 2007 Census), the township of Rakiraki has been incorporated. Moreover, incorporation of the township Navua (sometimes a combination of the townships Navua and Pacific Harbour) has on several occasions been considered in the past.

Rewa, the most urbanized province, remains by far the most densely populated one. It will be noted that this province has, with the exception of Rotuma, the smallest land area in Fiji. Naitasiri and Ba, two other provinces with a high level of urbanization, also have a higher population density than the national average. However, their land area is much larger than that of Rewa.

On the other hand, the provinces with the lowest population density are the entirely rural Namosi Province as well as Bua Province, which has a fairly large land area but only one very small urban area, the unincorporated township of Nabouwalu.

Only the Western Division has approximately the same share of Fiji's population and land. The Central Division has a much higher share of population than share of land whereas the opposite is the case in the Northern Division.

The following Table I-12 portrays the change in crude population density at the national, divisional and provincial level since 1986. Although Rewa remains by far the most densely populated province, Naitasiri is catching up fast due to the high urbanization rate in this province whereas urbanization in Rewa is stagnating.

For most users, crude population density is not a very meaningful density measure. It is clearly more useful to relate the population of a particular area to the amount of arable land of that area. This results in a measure of physiological or nutritional density. Unfortunately, the estimates of the amount of arable land, made by the Agricultural Department, are restricted to the provinces located on Viti Levu. Estimates for the provinces on Vanua Levu and the outer islands have not yet been made available.

Of the provinces on Viti Levu, the proportion of arable land is lowest in Namosi (9.4 percent). This proportion is also low in Nadroga and Naitasiri (14.8 percent and 17.3 percent of the total land area). For instance, if the relatively large population of Naitasiri Province is related to its rather restricted area of arable land, the physiological density of this province becomes 562 persons per km^2. However, this more refined index is also rather meaningless, since the population of Naitasiri is mainly concentrated in the urban sector of the province. For their livelihood, most of these urban people do not directly depend on land. It may therefore be more meaningful to relate Naitasiri's rural population of only 25,727 persons (in 2007) to the arable land of the province. This results in a far more reasonable estimate of physiological density of 90 persons per km^2.

Table I-12: Change in population density at the national, divisional and provincial level since 1986.

Division/ Province	Enumerated Population			Land Area [km^2]	Population Density		
	1986	1996	2007		1986	1996	2007
Total Fiji	**715,375**	**775,077**	**837,271**	**18,272**	**39**	**42**	**46**
Western Div	**283,349**	**297,184**	**319,611**	**6,360**	**45**	**47**	**50**
01: Ba	197,633	212,197	231,760	2,634	75	81	88
08: Nadroga	54,431	54,083	58,387	2,385	23	23	24
11: Ra	31,285	30,904	29,464	1,341	23	23	22
Central Div	**260,110**	**297,607**	**342,386**	**4,293**	**61**	**69**	**80**
09: Naitasiri	100,227	126,641	160,760	1,666	60	76	96
10: Namosi	4,836	5,742	6,898	570	9	10	12
12: Rewa	97,442	101,547	100,787	272	358	373	371
13: Serua	13,356	15,461	18,249	830	16	19	22
14: Tailevu	44,249	48,216	55,692	955	46	51	58
Northern Div	**129,154**	**139,516**	**135,961**	**6,198**	**21**	**23**	**22**
02: Bua	13,986	14,988	14,176	1,378	10	11	10
03: Cakaudrove	40,433	44,321	49,344	2,816	14	16	18
07: Macuata	74,735	80,207	72,441	2,004	37	40	36
Eastern Div	**42,762**	**40,770**	**39,313**	**1,422**	**30**	**29**	**28**
04: Kadavu	9,805	9,535	10,167	478	21	20	21
05: Lau	14,203	12,211	10,683	487	29	25	22
06: Lomaiviti	16,066	16,214	16,461	411	39	40	40
15: Rotuma	2,688	2,810	2,002	46	58	61	44

8. Coverage

8.1 General

As repeatedly stated, the most important objective of any census is that every person within the scope of the census is enumerated once and only once. If in the final analysis of the census, it appears that the quality of the collected data is good but that more than say 10 percent of the population has been missed out, the verdict will be that it was not a good census. It should also be remembered that the group of people that has not been included in the census, cannot be considered as a random selection of the population. It is for instance likely, that during a census, groups of persons residing in relatively inaccessible areas, persons with no fixed abode, those living in areas that have a reputation of being dangerous and others will probably be more affected by under-enumeration than others.

Some measure of the extent of under-enumeration can be obtained by means of a Post Enumeration Survey (PES). A PES is a survey of selected households carried out immediately after the Census. Unfortunately, because of operational and financial constraints, censuses in Fiji, like in most countries, were never followed by a PES.

Reports from the field as well as consistency tests carried out during the analysis of these censuses, do, however, suggest that under-enumeration during all censuses was within acceptable limits. Nevertheless, there has undoubtedly been some differential under-enumeration. For instance, it is likely that under-enumeration in the rural sector of some provinces during the 1976 Census was somewhat less complete than for the country as a whole. Possible reasons for this include that this was the first census after Independence and most provincial authorities involved in the census had no experience with census taking. Furthermore, at that time the mapping of the smallest rural geographic subdivisions, the Enumeration Areas (EA) was still very incomplete.

8.2 Coverage during the 2007 Census

Prior to, and during the 2007 Census field operation several measures were put in place with the objective of reducing under-enumeration to a minimum. Initially, this even included a PES, to be carried out by Area Coordinators. Unfortunately, as already mentioned, this PES did not eventuate, due to operational as well as financial constraints.

The following sections list some of the measures that were put in place prior and during the 2007 Census field operation, with the aim to reduce under-enumeration to a minimum.

- Role of Area Coordinators.

Firstly, and probably most importantly, the 2007 Census field operation was controlled by specially selected Area Coordinators AC). These ACs received intensive training not only in all aspects of a census field operation but especially in problems related to coverage and quality control. In the past this was part of the responsibility of staff of the provincial administrations, like district officers (DO) and other officials.

During the preparation phase of the 2007 Census, most of these ACs were actively involved in census related activities in their district. This had almost certainly a positive impact on census coverage. The general familiarization of the ACs with their district included:

- Clarification of census boundaries on the map and on the ground
- Identification of Non-Private Dwellings (NPD) and preparing these NPDs for enumeration
- Identification of places where homeless people in their district sleep and eat
- Tracing locations that may be inhabited by recent migrants etc.[21]

[21] During the 1996 Census, the category recent migrants, particularly from Asia were probably more under-enumerated than any other group.

- Awareness creating activities, particularly through participation in Tikina Council, Church and other meetings in their district.

- Coverage rules

In order to achieve optimal coverage, a detailed knowledge of and strict adherence to the census coverage rules is essential. During the training of field staff, much emphasis was placed on the 2007 census coverage rules (as well as quality control). As already mentioned, the 2007 Census was once again carried out on a de-facto basis. This means that all persons present in the country at midnight 16 September were enumerated at the place (household) where they spent census night, irrespective of their usual place of residence.The enumerator visited every household in his/her EA as soon as possible after census night and recorded the particulars required of every person staying with the household on Census Night.[22]

Since the basic unit of enumeration during the 2007 census was once again the household, the concept of household and conditions for household membership were precisely defined.[23]

Furthermore, many implications of the de-facto coverage rules were also precisely defined, i.e. the coverage rules with regard to visitors, traveling household members, household members working nightshifts, persons on board a ship such as fishermen out at sea, domestic servants, homeless people, groups of persons living in the same dwelling but with their own separate eating and housekeeping arrangements and many other special categories, i.e. those spending census night in a collective household (health institutions, corrective institutions, boarding schools, barracks etc.) Furthermore, special rules were established in the case of uninhabited dwellings.[24]

- Boundaries

Census coverage relates to a precisely defined area with fixed boundaries. Although Fiji's international boundary as well as its internal administrative boundaries (divisions, provinces and tikinas) have not changed since 1996, there have been very significant changes in other boundaries during the 1996-2007 intercensal period, particularly some urban and city/town

[22] The households in a very limited number of predominantly high class EAs in some urban areas were, for the first time enumerated by means of self-enumeration. The enumerators assigned to these EAs, distributed the self-filling questionnaires and collected them as soon as possible after census night.

[23] As during previous censuses, the 2007 census household was again defined as consisting of

> *"those persons who usually eat together food prepared for them in the same kitchen and who together share the work and cost of providing the food."*

In other words, a household:

- May consist of one or more persons
- May occupy one dwelling, part of a dwelling or many dwellings

[24] For visitors from overseas, only very basic information was collected such as name, age, sex, country of citizenship and the reason for their visit to Fiji. These visitors will only appear in some of the summary tables of the census but not in the standard set of tables that will be produced after the processing of the data.

boundaries. In the meantime, the new boundaries have all precisely been mapped. It also needs to be emphasized that the above boundaries have forced changes in many EA boundaries. It must be stressed that boundary problems during data collection frequently lead to coverage problems, especially in a nation-wide census .

All field staff were also instructed to carry out the enumeration in a systematic and orderly manner. This systematic approach should ensure that no household is left out or enumerated more than once. During the entire enumeration, enumerators in neighboring EAs collaborated closely with each other. This was particularly important in squatter areas close to or in cities/towns and their peri-urban areas.

- Last coverage check and labeling

At the end of each interview, enumerators were instructed to carry out a number of checks with regard to completeness (as well as quality). After completing these checks, a self-adhesive label with the appropriate GPS or waypoint number was attached at a place on the dwelling where it can easily be seen. Enumerators ensured that the three labels for the house, the census book and the gate were the same. The purpose of the label is to ensure that no household is enumerated twice and that none is missed. It makes checking easier.

- Self-reporting

Towards the end of the field operation, the Census Commissioner made an announcement via radio, TV and in the newspapers for people who believed that they had not been enumerated to contact the nearest Census Superintendent who then took the appropriate action that resulted in the enumeration of the people involved.

- Provisional summaries at the EA level

At the end of an interview, enumerators carried out a number of coverage and data quality checks. They then completed a summary table (included at the bottom of the back page of the interview schedule). This summary table includes the total population as well as the population age 21 and over (voting population) by sex and ethnicity: Fijians, Indians, Rotumans and Others.

Ethnicity	**Tot. Pop.**			**Pop. 21+**		
	P	**M**	**F**	**P**	**M**	**F**
Total						
Fijians						
Indians						
Rotumans						
Others						

These provisional counts were amalgamated at the EA and next at higher geographic levels. The provisional summaries of persons by ethnicity and sex provided the preliminary totals for the

entire country and its main geographic subdivisions that were made available by the FBoS soon after the census field operation.

Moreover, the summaries for the population aged 21 and over by sex and ethnicity at the EA level were used by the Electoral Boundary Commission for the delineation of the constituencies.

The provisional totals at the EA level were compared with the projected totals, prepared by the FBoS. In case of significant discrepancies that could not be explained by EA boundary changes, recent migration or anything else, a thorough check was carried out. In some cases this included a complete mopping-up operation.

8.3. Post-censal coverage checks

As already mentioned, the scheduled PES after the 2007 Census did not take place. However, several other checks on the level of completeness (coverage) have been carried out. For two of these, data from completely independent sources has been used. These include:

- Vital statistics (birth and death registration data) for the citizen population from the National Health Information System (NHIS) of the Department of Health and net-migration (transit statistics) collected at the border checkpoints by the Immigration Department. This data refers to the intercensal period 1996-2007.

- The number of citizens age 21 and over by ethnicity included in the Electoral Roll for the 2006 Census.

8.3.1. Demographic bookkeeping

Between the 1996 and 2007 Censuses, the FBoS has been carrying out a continuous demographic bookkeeping exercise. Taking the 1996 Census population as the base population, births were continuously added and deaths continuously subtracted. Similarly, immigration and emigration data from the Immigration Department during the same intercensal period were continuously added/subtracted. This exercise resulted in a Fijian and Indian population at the time of the 2007 Census that is close to the corresponding 2007 Census population. There is, however a significant discrepancy for the category “Others”. The discrepancy for this category is most likely related to inaccurate immigration and emigration data, possibly due to “change of status” and other factors. In this connection, it is important to note that, since 1996, more than 98 percent of the “change of status” cases in the transit statistics provided by the Immigration Department concern the category “Others.

8.3.2. Comparison of 2007 Census population with the population on the 2006 Electoral Roll

The citizen population age 21 and over by ethnicity, enumerated during the 2007 census has been compared with the number of registered voters during the last election. This is shown in Table I-13. The figures in column (2) refer to the registered voters by ethnicity in May 2006. In order to make them comparable with the 2007 census figures, they have been projected forward to 16 September 2007, assuming a growth rate for each ethnic component similar to the average 1996-2007 intercensal growth rates for the different components over a period of 1.337 years. The

projected figures are shown in column (3). The citizen population age 21 and over for the same ethnic groups, enumerated in the 2007 Census is shown in column (4).

Table I-13: Comparison of the 2007 Census population aged 21 and over by ethnicity with the projected number of persons included on the Electoral Roll on the 16 September 2007.

Ethnic Group (1)	Registered Voters		Census Count Cit. Pop. 21+ (4)	Difference	
	May 2006* (2)	Projected to 16 Sept. 2007 (3)		Nr. (4)-(3) (5)	% (5):(3) (6)
Total	479,674	481,935	493,655	11,720	2.4
Fijians	256,014	261,950	264,367	2,417	0.9
Indians	204,470	200,542	204,866	4,324	2.2
Rotumans	5,373	5,413	6,131	718	13.3
Others	13,817	14,030	18,291	4,261	30.4

Note: * From Fiji Life Elections Website 2006.

The projected number of registered voters in 2007 is for all ethnic groups lower than the corresponding 2007 Census figures. For the total citizen population aged 21 and over, the difference is 11,720 persons, or 2.4 percent of the projected electoral roll population. This difference is not alarming, the more so since 4,261 out of 11,720 (or 36 percent of all cases) concern the category "Others".

It is particularly pleasing that there is relatively little discrepancy in the case of the Indians (about 2 percent) and particularly in the case of the Fijians (less than 1 percent). However, for Rotumans (13 percent) and especially for the category "Others" (30 percent), the discrepancy is large. The census population for these categories is much larger than the Electoral Roll population.

8.3.3. Comparison of DOE school enrolment data with census 'at-school" population

The 2007 school enrollment figures provided by the Department of Education and school attendance figures as reported during the 2007 Census are surprisingly close, considering that the DOE records enrollment whereas the census measures attendance. Correspondence of the two datasets is particularly close at the primary level. The 2007 Census count of primary school attendance (Class 1 to 6) is 103,995, whereas the DOE enrollment list shows a total of 103,641.The difference is only 354 students or 0.3 percent.[25]

[25] A more detailed comparison of the two datasets by sex and ethnicity can be found in Chapter V.

8.4. Concluding comments

During the 2007 Census, a certain number of people have undoubtedly not been enumerated and it is also possible that some may have been enumerated more than once. The net effect is almost certainly some undercount in the census data but it is believed that under-enumeration was not very serious. Nevertheless, it may be expected that certain sections of the population were more affected by under-enumeration than others. In most countries, there is differential under-enumeration by age and sex and particularly by ethnicity and by geographic subdivision and sector. In the case of Fiji, it is often assumed that under-enumeration in squatter areas is more extensive than in other places. Furthermore, the results from the 1996 Census suggest that the recent migrant population from Asian countries may have been far more under-enumerated than all other groups. Although special measures were put in place to cover this particular group more completely than in 1996, there are reasons to believe that under-enumeration of this particular group is still serious.

Finally, it should be stressed that under-enumeration does not only affect the total population count but it can cause a bias in all census data, due to the fact that the characteristics of missed people will almost certainly be different from those who have been included in the census.

9. Population projection 2007-2030

Prior to the 2007 Census, many people in Fiji expected that the total population of Fiji in 2007 would approach the one million mark. Considering the continuing high level of emigration, particularly of the Indian component of the population, this is however a totally unrealistic expectation. In fact, it would have been a miracle if the 2007 census population had been anywhere close to one million. In order to reach the one million mark, the 1996-2007 intercensal growth rate should have been 2.3 percent per year instead of the measured 0.7 percent per year. A growth rate of 2.3 percent per year for the intercensal period 1996-2007 could only have been achieved if Fiji had experienced significant immigration instead of massive emigration after 1996.

Finally, if the different ethnic components of the population would, after 2007, continue to grow at their present rates, the projected total population of Fiji in 2010, 2020 and 2030 would be as follows:

Year	Total Population
2007 (Census)	837,271
2010 (Projected)	857,000
2020 (Projected)	936,000
2030 (Projected)	1,034,000

Given continuation of present trends, the total population of Fiji would reach the one million mark just before 2030.

II. POPULATION COMPOSITION: AGE AND SEX

The characteristics of a population at a particular point in time refer to its size, composition (structure) and distribution. Size and distribution of the population have been covered in Chapter I. Chapter II is concerned with the most basic structural characteristics of the population.

- Section 1 focuses on the age-sex structure
- Section 2 deals with changes in the ethnic composition
- Section 3 investigates the rural-urban composition.

Once again, the situation in 2007 is compared with that during previous censuses, particularly the one carried out in 1996.

An analysis of the socio-economic composition of the population such as marital status, labour force, employment and unemployment, education and literacy and religion is presented in the subsequent chapters of this Analytical Report.

1. Age and sex structure

Age and sex are the key or central variables in all demographic as well as socio-economic analysis. Most attributes of a population can only adequately be described when they are related to age and sex.

Data collection systems, including censuses, record the age and sex of all respondents. All of these, but particularly censuses, place much emphasis on the correct reporting and recording of these basic population variables. All individual data collected in censuses, surveys and other data collection systems is cross-classified with the variables age and sex. Consequently, if this basic data is of poor quality, the quality and usefulness of all data with which it has been linked diminishes as well.

During the preparation and field operation of all censuses in Fiji since 1946, much time and effort has been spent to ensure that the recorded age (and sex) data would be accurate. Generally, establishing the sex of respondents poses few problems. The same can, unfortunately not be said with regard to the accurate reporting of age. Reporting and recording of age during censuses is almost universally to some extent inaccurate. This is particularly the case in societies where many people do not know their age precisely. During the early censuses, this was clearly the case in Fiji.

The first part of this section therefore deals with the extent of age misreporting during censuses in Fiji. Next, the age-sex structure of the Fijian and Indian population at the time of the 1966, 1996 and 2007 censuses is compared. Attempts have been made to explain the changes in the

age-sex structure of the population over time, making reference to the three demographic processes (fertility, mortality and migration), which contribute to population change. Finally, some key indices that have been derived from the age-sex structure of the population since 1946 are discussed.

1.1. Accuracy of age-reporting

1.1.1. General

Age misstatement (or age misreporting) can be classified under two headings: age heaping and age shifting.

- Age heaping

This refers to the fact that, during a census (or other data collection activity), a certain proportion of the age records is affected by inaccurate reporting/recording. Some respondents report a preferred nearby number rather that their correct age. This is referred to as digit preference. As already mentioned, this bias in the data is particularly serious in countries where many people have limited knowledge of chronological age. This was the case in Fiji at the time of its early censuses.

Whenever age heaping occurs, it tends to take the form of terminal digit preference. Not surprisingly, the terminal digits that are most overrepresented are usually 0 and 5. The reason is that census enumerators estimate the age of persons who do not know their age or only have a vague idea. In doing this, they often round the vague age reports received from the respondents to ages ending on 0 or 5. This form of terminal digit preference is very much prevalent during the early censuses in Fiji. However, this is by no means the only form of digit preference that has occurred in Fiji.

From the demographic/statistical point of view, it is important to note that age heaping is an unbiased error. This means that age misstatement probably goes equally in both directions, up and down. Aggregation of data from single years to five-year age groups usually obscures most of the distortions that are present in the data in single years.

- Age shifting

This refers to systematic under- or overstatement of age by persons in certain stages of their lives. Generally, the shift of ages is in one direction, either up or down. Consequently, from the statistical point of view, age shifting is considered a biased error. This form of age misstatement is far more difficult to detect than age heaping. One example is that elderly persons often overstate their age, particularly in societies where advanced age is associated with high status. An example of age shifting in Fiji that occurred during the earlier censuses is that married Indian women in the age group 10-14 were sometimes recorded as aged 15-19.

1.1.2. Initial methods to assess accuracy of age reporting

Some of these include the following:

- Inspection of the tabulated data by age in single years

  This usually immediately reveals whether or not age heaping has been a serious problem during the census data collection phase. The inspection of the tabulated data by age in single years included in the 1946 Census Report of Fiji provides a good example. This data is clearly very much affected by age heaping, especially on the digits 0 and 5. Comparison with the same data collected in the 1956 and 1966 Censuses suggests that, in the interval, accuracy of age reporting has significantly improved.

- Comparison with an expected configuration

  This reveals whether or not the age data has been affected by serious misstatement. For instance at the time of the early censuses in 1946, 1956 and 1966, when the Fijian component of the population was fairly close to the stable state, comparison of its age-sex structure with that of model stable populations suggested a certain amount of age misreporting.

- Investigation of age and sex ratios[26]

  This method provides an indication of distortions in the age sex-structure due to age misreporting but even more as a result of factors like migration, war and other circumstances that tend to have an age-selective impact on the age-sex structure. Ideally, the age ratios should be close to 100 and the sex ratios should gradually change with increasing age. The more the age-sex structure is distorted, the further the age and sex-ratios deviate from the ideal values.

1.1.3. Indices of age accuracy[27]

Accuracy of age reporting can be expressed by means of an index. There are many indices of age accuracy, but the ones used in Fiji since the 1946 Census, include Whipple's Index, Myers' Index and the UN Secretariat Index.

- Myers Index

  This index measures digit preference or dislike for each terminal digit 0 to 9. An example of the computation of this index, using the 2007 Census data for Fijian females in single years is given in Appendix C.[28] The range of this index is between 0 (no age heaping) and 180

[26] The age ratio is defined as the number of persons in a given age group divided by the arithmetic average of the numbers in the two adjoining age groups. The sex ratio is the number of males per hundred females in the same age group.
[27] These methods are discussed in United Nations, 1955.
[28] This method was originally published in: Myers, 1940.

(maximum age heaping).[29] Change in Myers' Index for a particular population over time is usually inversely correlated with the level of education and literacy of that population. In other words, when the population becomes more educated and literate, Myers's Index tends to drop.

Since the 1946 census, Myers Index has been computed from the age data in single years by sex. Unfortunately, in the past, this has only been done for the total population of the country and for the main ethnic groups and not for the provincial populations. The national average indices for Fijians and Indians are presented in Table II-1.

Table II-1: Myers' Indices for the total population by sex and ethnicity derived from all censuses since 1946

Census Year	Fijians		Indians	
	Males	**Females**	**Males**	**Females**
1946	13.8	22.7	28.4	41.6
1956	5.2	8.1	17.4	22.6
1966	4.2	6.6	9.2	14.2
1976	3.6	4.0	5.2	5.8
1986	2.4	3.4	2.7	3.4
1996	1.8	1.8	2.8	3.1
2007	3.7	2.6	3.2	2.1

The 1946 indices indicate that, in that year, age heaping was a serious problem, particularly for the Indians. It will also be noted that, for the early censuses, the female indices for Fijians but particularly those for Indians are significantly higher than the male indices. Since, as mentioned, accuracy of age reporting tends to be positively correlated with education and literacy, the most likely reason for the discrepancy between the male and female indices is that in those days a higher proportion of males compared to females had received at least primary education.

The indices derived from subsequent censuses suggest that there has been a dramatic improvement in the accuracy of age reporting in Fiji after 1946. It is, however, unlikely that this is entirely due to improvements in education and literacy. Since World War II, policy makers and planners have increasingly realized that the availability of an accurate age-sex structure of the population is one of the most basic planning requirements. Consequently, the 1956 and subsequent censuses placed a very large emphasis on accurate age reporting and recording.

[29] Theoretically, in the best possible case, when all members of the population know their age, report it correctly and their age is also correctly recorded by the enumerator, Myers's Index will be 0. This indicates that no age misreporting or recording occurred during the census. In the worst possible (and very unrealistic) case, when all members of the population report an age with the same terminal digit, i.e. 0, Myers' Index will reach its maximum value of 180.

In 1956 the indices for Indian males and females are still relatively high. By 1976, the indices for Fijians and Indians and for males as well as females have reached a very reasonable level. Between 1976 and 1996, there has been some further improvement, albeit marginally.[30] It will also be noted that the sex differential in the indices from the earlier censuses, indicating more accurate age reporting by males than by females, has in recent censuses, all but disappeared.

The 2007 indices at the national level (except the one for Indian females) are slightly higher than those for 1996. Since during the 2007 field operation there was at least as much, if not more emphasis on accuracy of age reporting and recording than during previous censuses, the reason(s) for this slight increase must be found elsewhere. One likely reason is that the 2007 census data was scanned for the first time. It is likely that the scanning equipment misread some of the age information. Moreover, data that could not be scanned or was scanned incorrectly was probably not always properly verified.

In theory, another reason could be related to the massive out migration of mainly educated people since 1996. Considering the very strict requirements for migration overseas, it may safely be assumed that virtually all those who migrated know their age exactly. Consequently, the proportion of persons whose age had to be estimated during the 2007 Census may have been somewhat higher than in 1996. In other words, the slight increase in Myers' Index in 2007 may be associated with the "brain drain" from the country. However, if this were the case, this should affect the Indian indices more than the Fijian ones. This is not the case. It is therefore likely that the main reason for the slight increase in the indices in 2007 is due to scanning problems.

Unfortunately, for all censuses until 1966, Myers' Index cannot be computed (anymore) at the provincial level. The reason is that the provincial age-sex structures in single years were not published in the reports of these early censuses. Presently, it is not possible to retrieve the single-year age data from the censuses that were not computer processed (1946) and those that were processed in Australia (1956 and 1966). From 1976, onwards, the census data was processed in Fiji but not by the FBoS. It is possible to produce the provincial age-sex structures in single years for these years. In the meantime, this has been done for the 1986, 1996 and 2007 Censuses. The provincial level indices computed from the age data in single years by sex and ethnicities for these years have been included in the Provincial Profiles.

- <u>UN Secretariat Index</u>

  This index measures any kind of deviation in the age-sex structure from the standard. These deviations can be caused by migration, war, and differential under- or over- enumeration of persons in different age groups etc. The index is based on age and sex ratios for subsequent five-year age groups. The age ratios are computed separately for males and females. In a population with an age-sex structure that is not affected by any of the abovementioned distortions, in other words, an age-sex structure that is entirely smooth, all age ratios should be approximately 100. Deviations from 100 are considered as caused by the distorting factors.

[30] In this respect, it is important to note that, by 1996, Fiji became close to achieving the universal primary education (UPE) target of Millennium Development Goal 2.

Furthermore, in populations not affected by any of the above distortions, the sex ratios for subsequent five-year age groups may be expected to decrease gradually with increasing age. This is due to the fact that in the majority of populations; including Fiji, the mortality risk at all ages is higher for males than for females. Furthermore, the sex ratio at birth for most populations is more than 100.[31] In populations with incomplete and inaccurate birth registration, it is usually assumed that its sex ratio at birth is at the world average level of 105. This means that for every 100 live born female children, there are 105 live born male children. Like all sex ratios, the sex ratio at birth is expressed in %.

An example of the computation of the UN Secretariat Index, using 2007 Census data for Fijian males and females in five-year age groups is given in Appendix C. One problem with this index is that, unlike Myers' Index, it does not have a fixed range (minimum and maximum value).

As in the case of Myers' Index, early census reports only include the indices at the national level. They are shown in Table II-2.

Table II-2: UN Secretariat Indices for the population by ethnicity derived from all censuses since 1946

Census Year	Fijians	Indians
1946	60.3	132.8
1956	19.0	72.6
1966	15.4	33.1
1976	19.3	24.4
1986	14.7	14.4
1996	13.4	26.7
2007	14.0	23.2

Fortunately, all Census Reports since 1946, do, however include the basic information that is required for the calculation of this index at the provincial level, viz. the age-sex structure in five-year age groups. Consequently, the UN Secretariat Indices for all provinces, starting from 1946, have now been derived from all censuses. Once again, they have been included in the Provincial Profiles.

The national average indices suggest that the age-sex distributions in five-year age groups were, in 1946, very much distorted. However, after 1946, these distortions diminished very fast, especially for the Fijians. In 1986, the index for both major ethnic components of the population reached a relatively low level. After 1986, the national average index for Indians has increased again. This is probably mainly a result of very substantial age and sex differential migration after the 1987 coups. This has distorted the age-sex structure of the Indian population.

[31] The sex ratio at birth is defined as the number of live born male per 100 live born female children in one year.

In conclusion, age accuracy tests indicate that, although accuracy of age reporting was very imprecise during the early censuses, this is not the case anymore during recent censuses. These tests confirm that age reporting during censuses has now reached a very reasonable level of accuracy.

1.2. Change in the age-sex structure

The age-sex structure of a population is usually represented in the form of an age-sex pyramid. The age-sex pyramid is a bar graph with the bars turned sideways. Age-sex pyramids can be based on numbers and proportions (%) in subsequent age groups.

The proportional age-sex pyramids for the total population, for the main ethnic groups (Fijians and Indians) as well as for the rural and urban population in 1956, 1996 and 2007 are presented in the following sections.

1.2.1. Total population

In Figure II-1, the age-sex structure of the total population in 2007 is compared with that in 1996. It appears that the trend that started some 50 years ago has continued during the 1996-2007 intercensal period. The age-sex structure has continued to narrow at the base, because of a continuing decline in fertility. However, changes in the age-sex structure of the total population represent changes in the age-sex structure of all components of the population, particularly the two major components, the Fijians and Indians. Analysis of all previous census age-sex structures has shown that the impact of the demographic processes (fertility, mortality and migration) on the age-sex structures of the component populations has been very different. The same applies to the impact of these demographic processes on the rural and urban age-sex structure. This differential impact is discussed in the following sections.

1.2.2. Main ethnic groups

Until 1966, the Fijian age-sex pyramid was broad at the base. This was the result of a very high level of fertility at that time. In 1966, the Fijian fertility transition had not yet started. Figure II-2 shows that, thirty years later (in 1996), the Fijian age-sex pyramid has clearly become narrower at the base because of the gradual decrease in fertility during the 1966-1996 interval. In 2007, the age-sex pyramid has further narrowed at the base, because of the continuing fertility transition.

Because of a very high level of fertility, the Indian age-sex pyramid in 1966 was even much broader at the base than the Fijian one. In fact, the Indian level of fertility at the time was amongst the highest in the world. Moreover, at that time, the Indian fertility transition had already started. The Indian fertility transition proceeded at a very fast rate by any standard. Figure II-3 shows that, by 1996, the Indian age-sex pyramid had become very narrow at the base and has continued to narrow after that.

Figure II-1: Comparison of the proportional (%) age-sex structure of the total population in 1996 and 2007

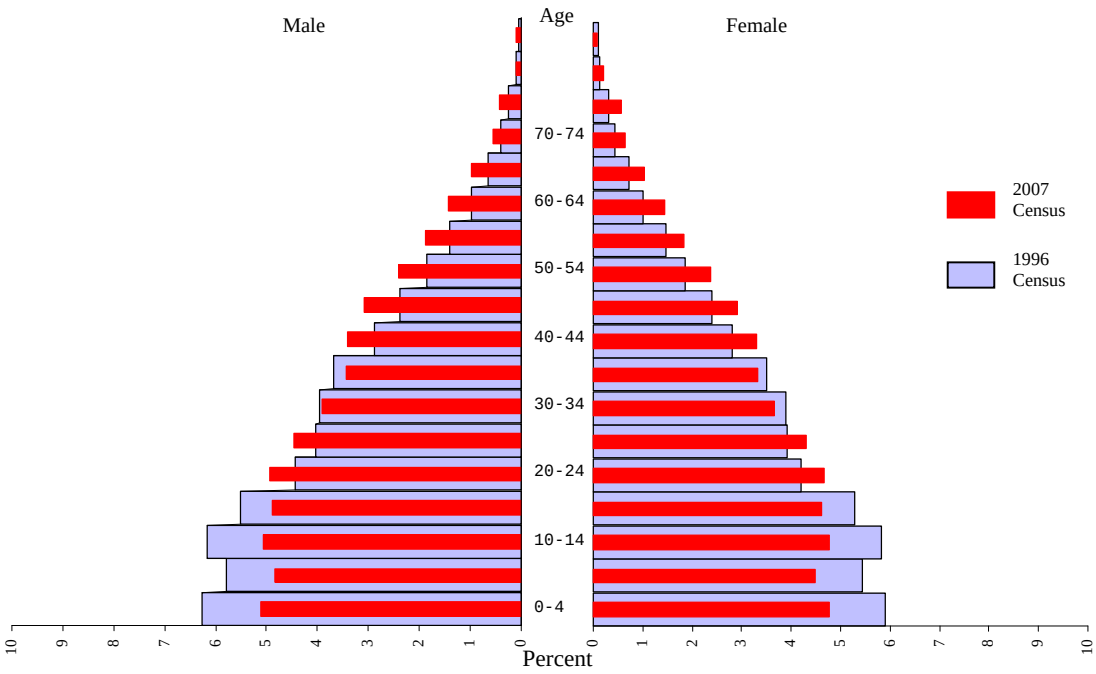


Figure II-2: Comparison of the proportional (%) age-sex structure of the Fijian component of the population in 1996 and 2007

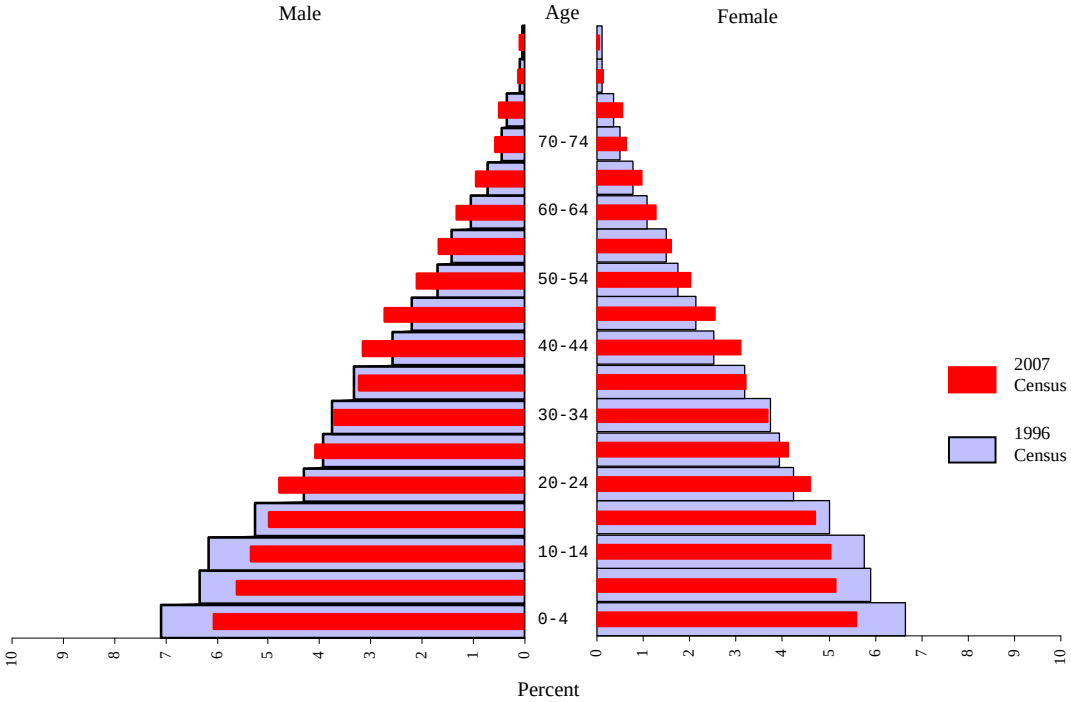
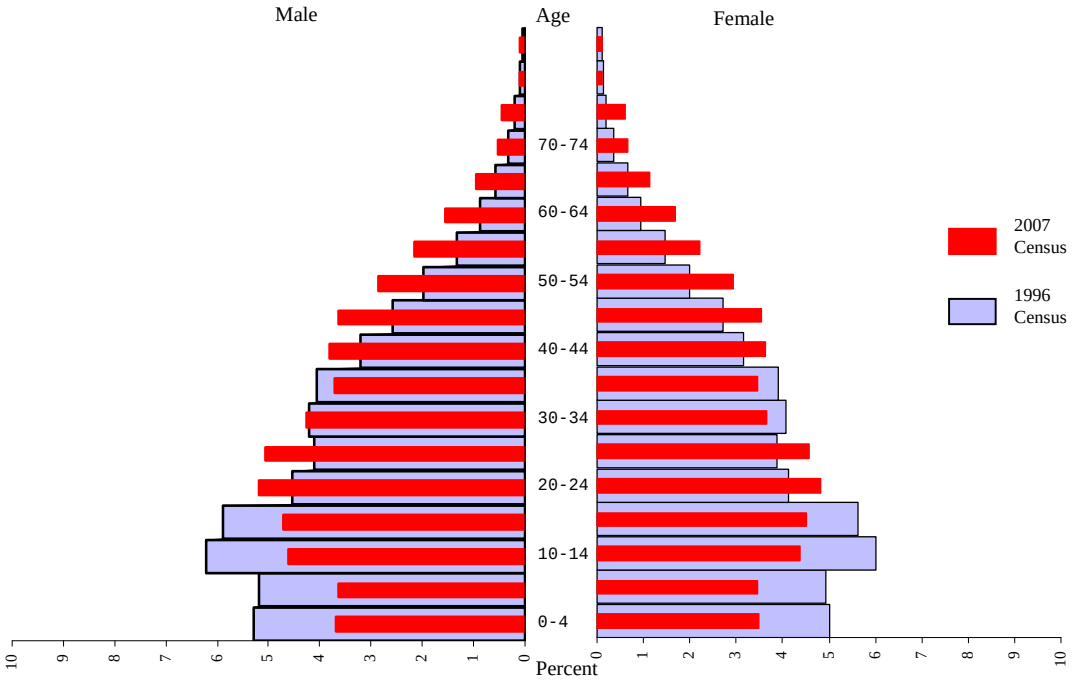


Figure II-3: Comparison of the proportional (%) age-sex structure of the Indian component of the population in 1996 and 2007.



II-4: Comparison of the proportional (%) age-sex structure of the Indian component of the population in 1956 and 2007.

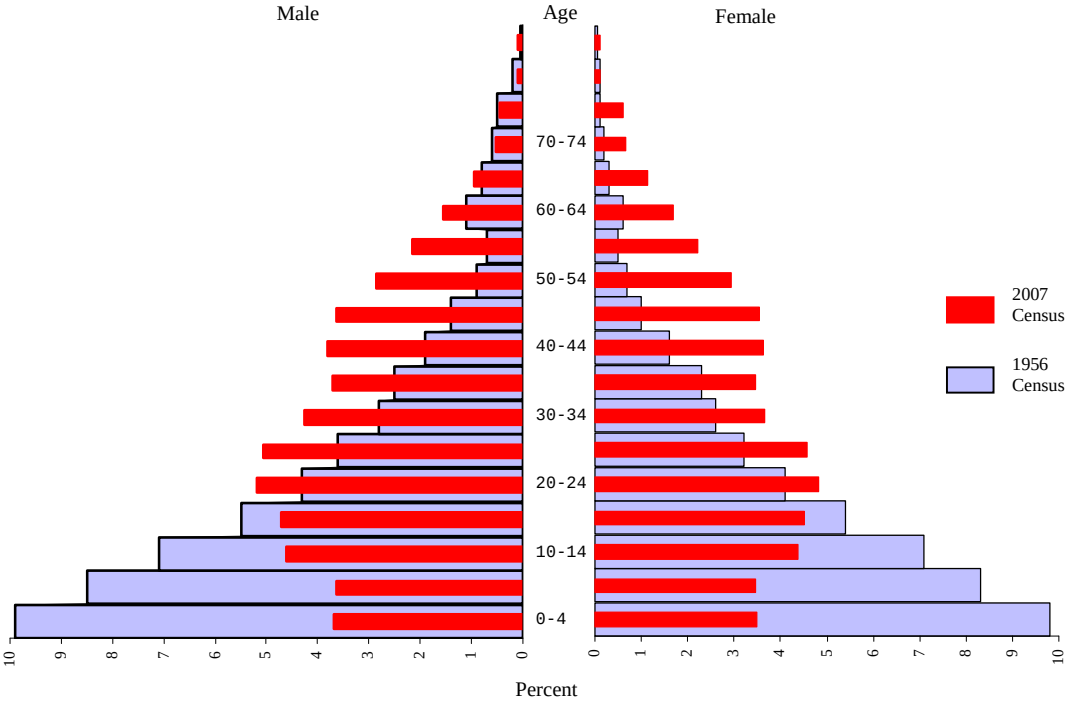


Figure II-4 demonstrates the impact (on the age-sex structure) of the probably unprecedented fast decline in Indian fertility since the inception of their fertility transition in the 1950s. In the early years of the third millennium, the Indian Net Reproduction Rate (NRR) dropped below 1.0. This means that Indian fertility has reached replacement level. A very significant part of this fertility transition has been achieved at a time when family planning services in Fiji were close to non-existent and the concept reproductive health had not yet been invented. Continuation of the trend, depicted in Figure II-3 and II-4 will soon lead to a level of old-age dependency amongst Indians approaches that of most European populations as well as the Japanese population.

1.2.3. Geographic sectors

Figure II-5 and 6 present the change in the rural and urban age-sex pyramid during the 1996-2007 intercensal period. In 2007, the rural age-sex structure is only slightly broader at the base than the urban one. In 2007, 51 percent of the total population is urban and a significant part of the population in the rural sector is living in places with relatively easy access to an urban area and its services.

Figure II-5: Comparison of the proportional (%) age-sex structure of the rural population in 1996 and 2007

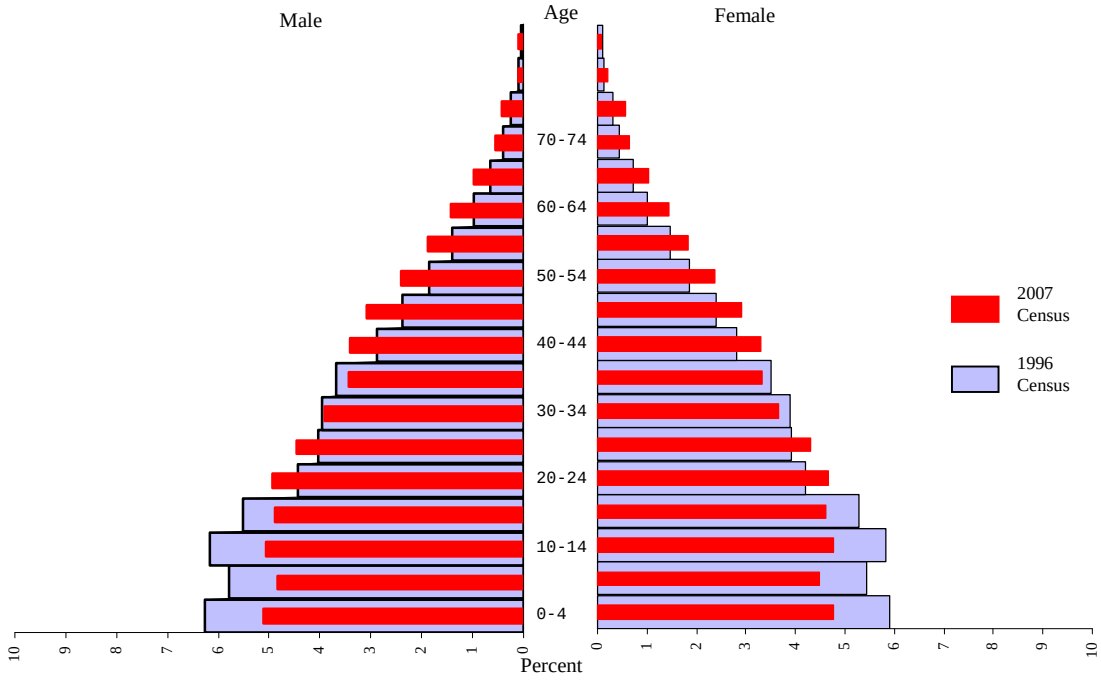
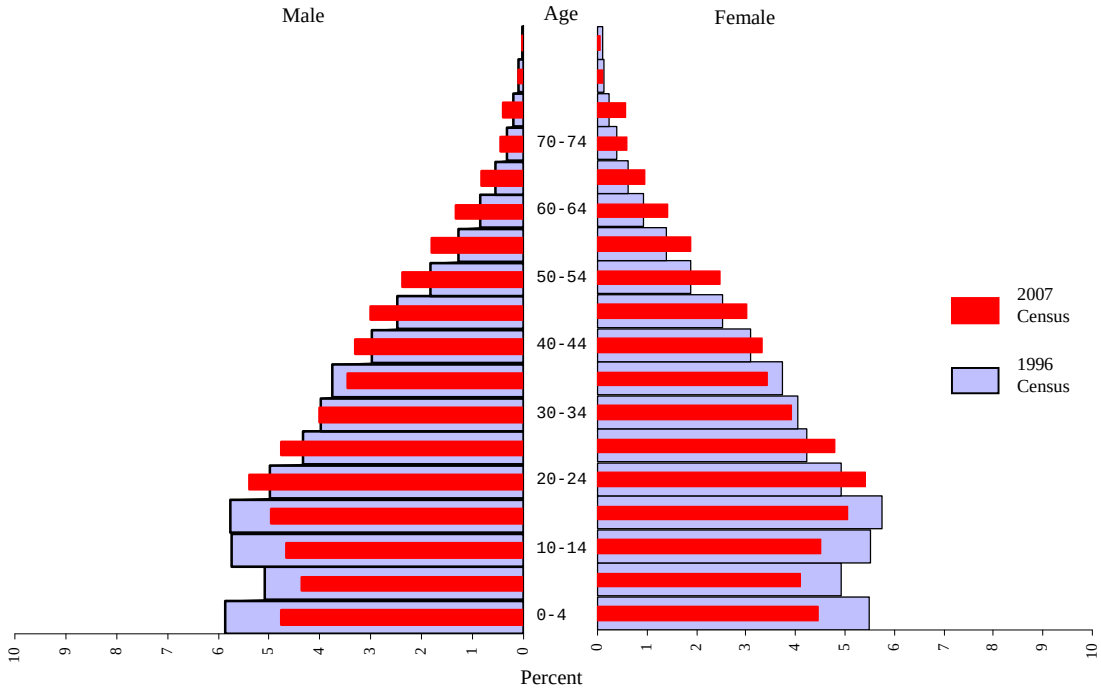


Figure II-6: Comparison of the proportional (%) age-sex structure of the urban population in 1996 and 2007



1.3. Indices derived from the age-sex structure

Some of the common indices derived from the age-sex structure include the Dependency Ratio (DPR), the Child-Woman Ratio (CWR) and the Median Age (Me). These indices for the total population as well as Fijians and Indians for all census years since 1946 are shown in Table II-3.

Table II-3: Dependency Ratios, Child-Woman Ratios and median ages for the total population by ethnicity for all census years since 1946.

Census Year	Dependency Ratio			Child-Woman Ratio			Median Age		
	Total	Fij.	Ind.	Total	Fij.	Ind.	Total	Fij.	Ind.
1946	91.6	79.7	109.1	81.4	64.5	104.7	17.9	19.7	15.7
1956	97.1	83.8	114.1	83.2	71.2	97.2	16.8	18.9	14.8
1966	96.6	89.5	105.2	77.9	77.6	79.2	16.5	17.8	15.2
1976	77.1	80.2	74.5	55.9	60.8	51.6	17.8	18.2	17.5
1986	70.4	74.8	66.7	55.5	61.5	50.4	20.6	20.2	20.9
1996	62.6	70.5	54.6	46.7	55.4	37.4	21.2	20.1	22.4
2007	50.8	59.6	38.9	36.9	44.9	25.4	25.1	23.0	27.9

- Dependency Ratio

  The Dependency Ratio (DPR) is defined as the sum of the population 'less than 15' and the population '65 and over' ('dependent' population) divided by the population '15 to 64' ('working population') times 100.

  The DPR for Fijians reached its highest level in 1966. As already mentioned, at the time Fijian fertility was high, resulting in a high level of youth dependency. With gradually decreasing fertility after 1966, youth dependency also decreased. It appears that after 1996, youth dependency for Fijians has dropped significantly.

  Between 1946 and 1966, the Indian DPR was extremely high, reflecting the extremely high fertility level of those days. However, in 1966, Indian fertility had already started to decrease at a very fast rate resulting in far lower youth dependency by 1976. After that fertility continued to decrease. In 2007, Indian youth dependency has reached a very low level. Since 1986, old age dependency has become an increasingly larger part of overall dependency of the Indian component and this will undoubtedly continue in the future.

  Dependency ratios only provide a rough indicator of dependency. Not all persons in the "dependent" age groups are dependent and not all persons in the "working" age group are workers. More sophisticated indicators of dependency are derived from the Employment and Unemployment Surveys as well as Household Income and Expenditure Surveys, which the FBoS carries out at regular intervals. However, it will be noted that the simple and straightforward dependency ratio can be derived from any data collection that includes the basic variables age and sex. Most importantly, this can be done at no additional cost.

- Child-Woman Ratio

  The Child-Woman Ratio (CWR) is defined as the number of children (of both sexes) under the age of five divided by the number of females in the reproductive age span times 100. In order to maintain comparison with already published CWRs in the past, the reproductive age span in this report is defined as age 15 to 49. In a population that has not experienced significant age and sex differential under-enumeration as well as migration, the CWR serves as a proxy index of the level of fertility. In populations where these ideal conditions are not met, (i.e. the Indian population of Fiji since the coups in 1987), the CWR should only be used as an index of fertility with the utmost caution. The CWRs for the total population, Fijians and Indians for all census years since 1946, are also presented in Table II-3.

  At the national level, the CWR for the Fijian component increased between 1946 and 1966. As already mentioned, during this period, Fijian fertility reached its highest level. The fertility transition for Fijians started after 1966 and this is reflected in the decreasing CWR. It seems that, after 1996, the Fijian fertility transition has again got some momentum.

  The extremely high level of fertility for the Indian component in the past is reflected in the very high CWR of 104.7 in 1946. Soon after that, fertility started to decrease. The rate of

decrease between 1956 and 1976 has been extremely fast by any standard. After the coups of 1987, the downward trend in Indian fertility got new momentum. In 2007, a very low CWR of 25.4 has been achieved. It should also be reiterated that the analysis of census data in combination with that of birth registration data collected by the National Health Information System (NHIS) of the Department of Health (DOH) suggests that, at the beginning of the 21st century, the Indian component of the population reached replacement level. The analysis of data from these sources suggests that the Total Fertility Rate (TFR) of this component, dropped from 2.7 in 1986 to 2.4 in 1996 and next to 2.0 in 2001.

- Median Age

The median age (Me) is that age where 50 percent of the population is younger and 50 % older. The median age for the total population and its main ethnic components derived from all censuses since 1946 are also shown in Table II-3. In 1946, because of the very broad based age sex structure in that year, the Median Age for Fijians was low and that for Indians very low. After 1956, fertility decline for Indians resulted in a fast increase in their median age. As expected, for Fijians, the increase in the median age started much later. Nevertheless, before 1986, due to the high level of fertility, the median ages for Fijians as well as Indians were still below 20 years. After that, the median age continued to increase at a moderate pace for Fijians and at a fast rate for Indians.

2. Change in the ethnic composition

The very different trend in the growth rates of the main ethnic groups has caused a dramatic change in the ethnic composition of the population. This change (between the 1946 and 2007 Censuses) is shown in Table II-4. In this table, the size of main components of the populations is given as a proportion (%) of the total population.

Table II-4: Change in the ethnic composition of the population between 1946 and 2007

Census Year	Fijians (%)	Indians (%)	Others (%)
1946	45.5	46.4	8.1
1956	42.8	49.0	8.2
1966	42.4	50.5	7.1
1976	44.2	49.8	6.0
1986	46.0	48.7	5.3
1996	50.8	43.7	5.5
2007	56.8	37.5	5.7

The implications of a continuation of present trends for the size and composition of the population of Fiji are shown in Table II-5. According to the base projection presented in Chapter

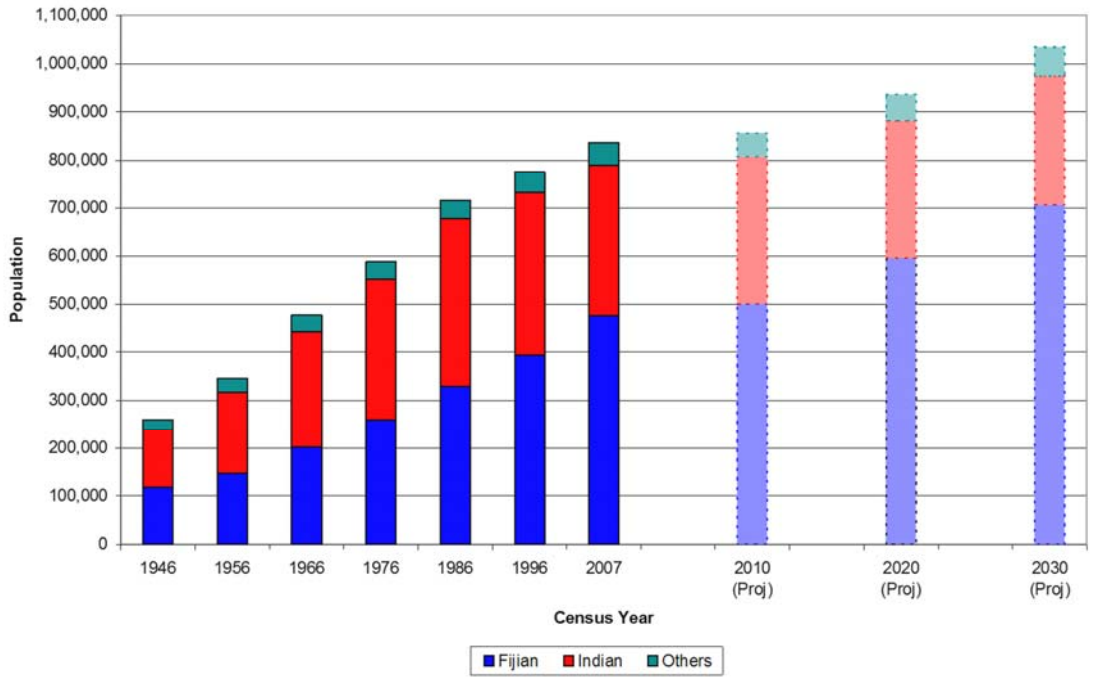
I, the population would reach the one million mark by 2030. Table II-5 shows that of this projected 2030 population almost 70 percent would be ethnic Fijians and about 25 percent Indians.

Table II-5: Projection of the ethnic composition of the population from 2007 to 2030, assuming continuation of present trends.

Year	Total Pop.	Fijians		Indians		Others	
		Nr	%	Nr	%	Nr	%
2007 (Census)	837,271	475,739	56.80	313,798	37.5	47,734	5.7
2010 (Projected)	857,000	501,000	58.5	307,000	35.8	49,000	5.7
2020 (Projected)	936,000	595,000	63.6	287,000	30.7	54,000	5.8
2030 (Projected)	1,034,000	706,000	68.3	268,000	25.9	60,000	5.8

Finally, the changes in the ethnic composition between 1946 and 2007 and projected over the period 2007-2030 are also shown in Figure II-7.

Figure II-7: Change in the ethnic composition of the population between 1946 and 2007 and projected until 2030



3. Change in the rural-urban composition

Table II-6 shows the change in the rural-urban composition between the 1966 and 2007 censuses. It also shows the projected rural and urban population for 2010, 2020 and 2030 based on a "no change" scenario.

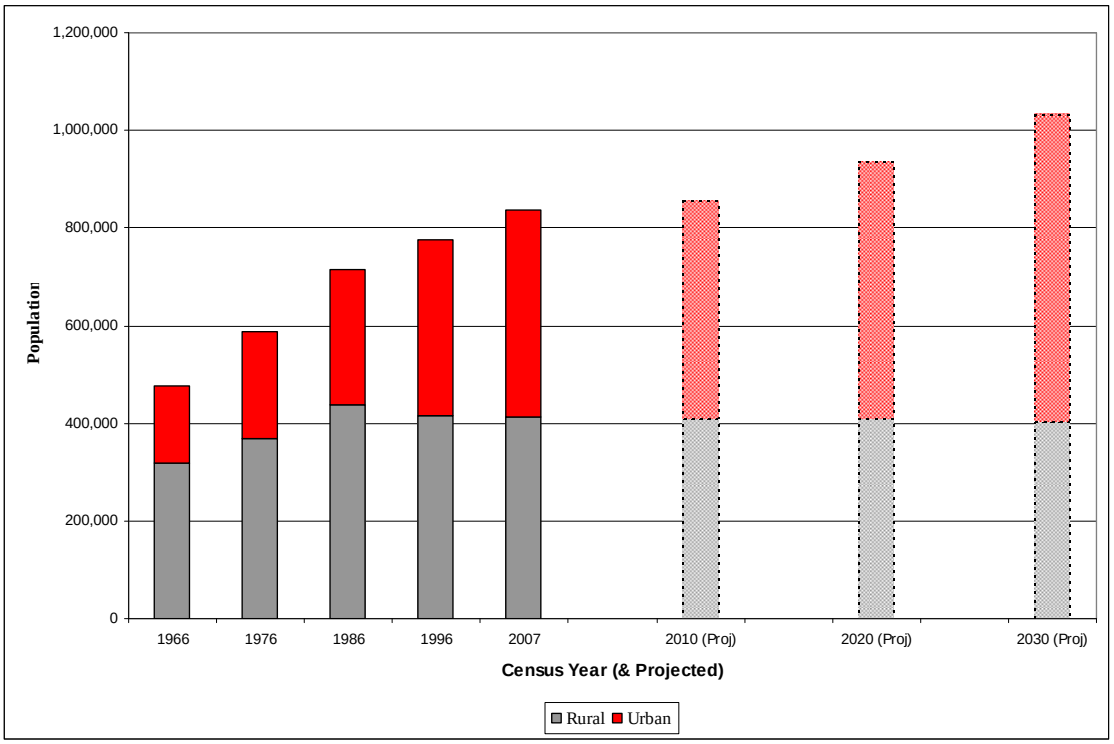
Table II-6: Change in the rural-urban composition of the population between 1966 and 2007 and the projected composition, based on a "no change" scenario between 2007 and 2030

Year	Total	Rural		Urban	
	Nr	Nr	%	Nr	%
1966 (Census)	476,727	317,468	66.6	159,259	33.4
1976 (Census)	588,068	369,573	62.8	218,495	37.2
1986 (Census)	715,375	438,350	61.3	277,025	38.7
1996 (Census)	775,077	415,582	53.6	359,495	46.4
2007 (Census)	837,271	412,425	49.3	424,846	50.7
2010 (Projected)	857,000	411,000	48.0	446,000	52.0
2020 (Projected)	936,000	409,000	43.7	527,000	56.3
2030 (Projected)	1,034,000	405,000	39.2	629,000	60.8

The data suggests that, based on trends between 1966 and 1986, the proportion of urban people during the next 10 years (1986-1996) increased faster than expected. In interpreting this, readers are reminded that, prior to the 1986 Census, the boundaries of the urban areas were not reviewed and revised. It is therefore likely that the rural-urban composition presented by the 1986 Census data is affected by a rural bias. In other words, prior to the 1986 Census, certain parts of the rural sector adjacent to some urban areas should probably have been included in the urban sector. This example emphasizes again that it is important that all urban boundaries are reviewed at a regular interval, and at least prior to all censuses.

Prior to the 1996 Census a major revision of all urban areas was carried out and some new census urban areas (Pacific Harbour, Nabouwalu and Seaqaqa), were established. Consequently, the 1996 Census almost certainly provides a more accurate picture of the rural-urban divide in Fiji than the 1986 Census. Prior to the 2007 Census, all urban boundaries were once again reviewed and, in a number of cases revised. It is therefore assumed that change in the rural-urban composition between 1996 and 2007, as shown in Table II-6 provides a realistic picture of the urbanization process in Fiji. Change in the rural-urban composition between 1966 and 2007, and projected growth until 2030 based on a "No-Change" scenario is also depicted in Figure II-8.

Figure II-8: Change in the rural-urban composition of the population between 1966 and 2007 and projected until 2030



III. MARITAL STATUS

1. Data sources

A country's civil registration system (CRS) does not only register the vital events births and deaths but also marriages and dissolution of marriage. The CRS is primarily a legal/administrative system and not a data collection system. The statistics it collects are a by-product of the system. If these statistics are complete and up to date, they provide an accurate picture not only of the fertility and mortality situation and trends but also of marital (conjugal) status in the country. Unfortunately, in Fiji, this is not (yet) the case.

Furthermore, even if the CRS publishes accurate information on marital status on a regular basis, this does not constitute a complete picture of marital status that is required by policy makers, planners and particularly researchers. The reason is that these users need information concerning the marital status of all members of the population, including those who have never married. However, never married persons and their basic characteristics are not registered by the CRS.

A further demographic/statistical limitation of the official marriage registration system of the CRS is that it is restricted to those who get legally married. In other words, the system does not record the so-called "de-facto" (or "consensual") unions.[32] In most countries (and Fiji is not an exception) an increasing proportion of all people live in this kind of socially accepted but unregistered union. For demographic/statistical purposes, partners in these unions are usually grouped together with those who are legally married. This is particularly important for fertility research, since childbirth is not restricted to couples in legally recognized unions.

The above implies that, even if a CRS provides complete and accurate data on a regular basis concerning the marital status of those who are legally married, this information needs to be supplemented by data from other sources. Since (sample) surveys designed to provide more detailed and precise information concerning marital status are seldom, if ever conducted, the main complementary source of this data is once again the national census. The census will provide basic information on marital status of all people covered under the census coverage rules.

2. Collection of data on marital status in a census

2.1. Marital status categories

In the early censuses in Fiji, the marital status options given to all respondents were restricted to:

[32] A de-facto or consensual union is defined as cohabitation by an unmarried couple for an extended period. It is a socially accepted union where the two partners live together as husband and wife but have not gone through any civil or religious ceremony.

- *Never Married*
- *Married*
- *Widowed*
- *Divorced*

The Reports of these censuses provide some basic information concerning marital status of census respondents by age, sex and ethnicity but only at the national level.[33]

Prior to the 2007 Census, the Users Advisory Committee recommended the use of a more detailed classification of marital status. Consequently, during this census, respondents were given six options from which they had to choose. These options are:

- *Single (Never Married)*
- *Legally Married (Not Separated)*
- *Separated but Legally Married*
- *De-facto / Consensual Union*
- *Divorced*
- *Widowed*

2.2. Problems

The collection of marital status data in a census interview situation is not problem free.

- The concept marriage

  In many societies, this concept is far from straightforward, since marriage is not seen as a categorical concept but more like a process. This is particularly the case in those societies that recognize customary (or common law) marriage. Fiji does not recognize customary marriage. Moreover, official polygynous unions do not exist in Fiji.[34]

- Consensual (de-facto) unions

  Nowadays, many partners live in a consensual or de-facto union and not in a legal union registered by the Registrar General's Office. However, most users of data on marital status are not only interested in information concerning legal or registered marital

[33] However, from those censuses that have been computer-processed in Fiji (1986, 1996 and 2007), tables on marital status at the provincial level have been produced.
[34] A polygynous union is a union where one man has more than one wife at the same time.

marriages but also in information about de-facto or consensual unions. As mentioned, this is particularly important in fertility research. On a nation-wide scale, this information can only be collected in a census. However, the census interview situation is not very suitable for the collection of data on marital status, particularly in the case of these respondents living in consensual (de-facto) unions. Discussing the precise nature of their marital relationship with a census enumerator may be a sensitive issue for them, particularly if the enumerator is a young person of a different sex. Consequently, during recent censuses, all enumerators have been instructed to accept and record the answers to marital status questions that are given to them by respondents, even in those cases where they suspect that these answers may not be correct. This diplomatic approach invariably leads to some bias in the data.

- Legal age at marriage

  The reports from early censuses in Fiji show that a significant number of males and females (particularly Indian females) under the age of 15 were married. The more recent census reports do not show any cases of persons below the age of 15, who are married. During these censuses, collection of data on marital status has been restricted to the population age 15 and over. The reason is that the legal age at marriage in Fiji is now 18 for males and 16 for females. During the editing of the marital status data from these censuses, it has been assumed that the few cases of married persons under age 15 were most likely due to either enumerator or response error. Although there are no legal marriages of persons below the age of 15 in Fiji, this is not necessarily true for consensual unions.

Analysis of the data concerning marital status by age and sex included in Census Reports of Fiji does indeed suggest that this data is affected by errors. This applies in particular to the information provided by young respondents (especially males) living in consensual (de-facto) unions. These respondents sometimes report their marital status as single. In the meantime, their de-facto wives tend to report their marital status as married particularly in those cases where the couple has children. With the rapid increase in the number of consensual unions in Fiji, it is expected that this form of bias will become more common in the future.

3. Change in marital status since 1946.

Proportions never married, married, widowed and divorced/separated by age (in five-year age groups), sex and ethnicity have been derived from the published census data since 1946. These are presented in Table III-1. Users who require more detailed data on marital status from the 2007 Census, i.e. concerning consensual unions, separation, divorce etc. are referred to the basic census tabulations.

The following sub-sections are concerned with a discussion of trends in the marital status categories “never married” and “married” whereas the last section briefly deals with dissolution of marriage.

Table III-1a: Marital status of the population age 15 and over by sex and ethnicity at the time of all censuses since 1946

Census Year	Ethnic Group	Sex	Never Married	Married	Widowed	Divorced/ Separated
1946	**All**	**M**	36.4	56.2	6.3	1.0
		F	25.7	62.5	9.9	1.1
	Fijians	**M**	40.8	51.0	6.3	1.9
		F	31.1	53.7	13.1	2.2
	Indians	**M**	30.2	61.7	6.6	1.5
		F	16.3	76.2	6.1	1.5
1956	**All**	**M**	34.0	60.4	4.4	1.1
		F	22.4	66.5	9.7	1.3
	Fijians	**M**	38.8	55.9	4.2	0.6
		F	27.3	58.9	12.2	0.9
	Indians	**M**	29.1	65.1	4.5	0.5
		F	15.8	76.2	7.4	0.5
1966	**All**	**M**	35.9	61.0	2.5	0.6
		F	25.9	65.3	4.2	1.0
	Fijians	**M**	38.7	57.9	2.8	0.4
		F	28.0	61.5	9.7	0.7
	Indians	**M**	33.5	63.9	2.2	0.3
		F	23.6	69.5	6.6	0.3
1976	**All**	**M**	35.9	60.4	2.2	1.4
		F	29.8	63.3	4.5	2.4
	Fijians	**M**	38.7	57.7	2.5	1.1
		F	28.4	60.2	8.4	1.8
	Indians	**M**	34.7	62.1	1.5	0.5
		F	27.3	63.3	7.2	1.1
1986	**All**	**M**	35.7	61.5	1.6	1.2
		F	26.7	63.5	7.4	2.3
	Fijians	**M**	39.8	56.8	1.9	1.4
		F	30.1	59.9	7.4	2.7
	Indians	**M**	31.9	66.8	0.8	0.5
		F	25.5	68.4	4.8	1.3
1996	**All**	**M**	36.1	60.8	1.9	1.2
		F	26.8	63.0	8.1	2.1
	Fijians	**M**	39.4	57.1	2.2	1.4
		F	30.1	60.0	7.6	2.3
	Indians	**M**	32.3	65.2	1.6	0.9
		F	22.5	66.9	8.8	1.9
2007	**All**	**M**	38.2	57.6	2.9	1.3
		F	28.5	60.8	9.0	1.8
	Fijians	**M**	41.8	54.2	2.9	1.1
		F	32.5	58.0	7.9	1.6
	Indians	**M**	33.3	62.4	2.8	1.4
		F	22.4	64.9	10.7	1.9

3.1. Never married

The proportion of never married Fijians is much higher than the proportion of never married Indians. However, during the most recent censuses, the difference has become less than it was during the early censuses (particularly the 1946 Census). Moreover, for all census years, the proportion never married males is very significantly higher than the proportion never married females. This applies to Fijians as well as Indians.

From the tabulated data by age and sex, it appears that, at the national level, the age distribution of the never married population has changed drastically between 1946 and 1996.[35] However, changes were far greater for females than for males. For instance, in 1946, about 60 percent of the 15-19 year old and about 20 percent of the 20-24 year old females were never married. By 2007, these figures have increased to 92 and 57 percent respectively. However, these enormous changes are almost entirely caused by changes in the proportions never married Indian females. The age at first marriage of Indian males and females has increased dramatically since 1946.

Furthermore, for most populations, a reasonable estimate of the average proportion unmarried males and females, which will remain unmarried is provided by the average of the proportions of never married males and females in the age groups 45-49 and 50-54. Above age 55, the proportions tend to remain at approximately the same level. It appears that, the national average proportions between 1966 and 2007 for these age groups are typically in the range 3 to 5 percent. After age 55, these proportions do indeed not change very much. This is, however not the case for males in 1956 and particularly in 1946. The proportions in these two age groups are much higher and they increase after that. As expected, this applies only to the Indian component of the population. The most likely explanation for this is probably related to the history of the Indian population prior to 1946. In Chapter I, it was shown that, at that time, the Indian population had a very high sex ratio.

Marital status at the provincial level since 1986 is presented in Table III-1b. The information is presented for three broad marital status categories by sex and ethnicity. De-facto (consensual unions) have once again been included in the category married. Moreover, all sub-categories of dissolved marriages have been combined into one category “widowed/divorced”.[36]

[35] For the marital status tables by age and sex, see the set of basic tabulations for these censuses.
[36] Detailed data concerning marital status at the provincial level is not available anymore from the censuses before 1986.

Table III-1b: Marital status of the population age 15 and over by sex and ethnicity at the provincial level at the time of all censuses since 1986

	Ethnicity	Year	Never Married (%)			Married (%)			Widowed/Divorced (%)		
			1986	1996	2007	1986	1996	2007	1986	1996	2007
Fiji	**Fijians**	**M**	39.8	39.3	41.8	56.7	57.0	54.2	3.4	2.7	3.5
		F	30.1	30.1	32.5	59.8	60.0	58.0	10.0	8.5	8.9
	Indians	**M**	31.5	32.3	33.3	66.4	65.2	62.4	2.1	2.0	3.8
		F	23.2	22.4	22.4	67.2	66.8	64.9	9.6	9.8	12.1
		Provinces of the Western Division									
Ba	**Fijians**	**M**	38.9	39.1	42.2	57.9	57.3	54.1	3.1	2.5	3.3
		F	30.1	30.0	33.4	60.8	61.2	56.8	9.0	7.4	7.9
	Indians	**M**	31.2	32.2	33.2	66.7	65.3	61.6	2.0	2.1	4.0
		F	23.1	21.9	21.9	67.6	67.3	65.7	9.2	9.4	12.0
Nadroga	**Fijians**	**M**	39.1	39.3	41.4	56.8	57.1	54.7	4.1	2.9	3.5
		F	29.8	29.2	32.0	59.6	60.7	58.9	10.6	8.8	8.7
	Indians	**M**	31.9	31.0	33.6	65.9	66.4	62.2	2.1	2.4	4.0
		F	23.1	20.5	20.8	68.6	70.1	68.7	8.2	8.7	10.2
Ra	**Fijians**	**M**	37.7	37.4	37.4	58.9	58.9	58.1	3.7	3.2	3.7
		F	27.5	27.8	27.8	62.7	62.7	62.4	10.2	9.3	9.1
	Indians	**M**	31.9	32.1	32.1	66.4	66.4	63.0	2.4	2.1	4.2
		F	24.5	21.1	21.1	70.7	70.7	66.7	7.9	8.9	11.9
		Provinces of the Central Division									
Naitasiri	**Fijians**	**M**	39.7	41.6	43.7	57.1	55.4	52.5	3.2	2.2	3.2
		F	30.3	33.0	35.8	60.2	57.8	54.5	9.3	7.8	9.0
	Indians	**M**	32.9	35.3	34.3	64.9	62.5	61.6	2.1	1.7	3.7
		F	23.3	24.2	23.3	66.3	64.8	63.5	10.4	10.0	12.5
Rewa	**Fijians**	**M**	44.3	43.9	45.4	52.5	52.4	50.5	3.1	2.6	3.7
		F	35.0	35.2	37.5	54.3	54.2	52.8	10.5	8.5	9.1
	Indians	**M**	33.5	37.8	39.1	64.1	59.3	56.1	2.4	2.3	4.2
		F	24.9	28.3	29.1	63.4	59.2	57.6	11.7	11.1	12.7
Tailevu	**Fijians**	**M**	39.2	38.0	44.4	56.5	57.5	51.0	4.2	3.2	3.9
		F	28.4	28.6	30.8	59.3	60.0	58.1	12.3	9.8	10.4
	Indians	**M**	33.7	33.3	35.6	63.8	64.1	60.7	2.5	2.2	3.3
		F	23.9	23.0	22.9	66.2	65.8	64.7	9.9	10.3	11.9
Namosi	**Fijians**	**M**	41.9	39.6	40.7	55.2	58.7	55.5	2.9	1.1	2.9
		F	30.9	28.8	29.9	61.3	63.6	61.1	7.8	7.1	8.3
Serua	**Fijians**	**M**	36.8	36.4	41.4	59.6	59.3	54.1	3.6	3.4	4.0
		F	28.3	29.0	33.5	60.5	60.5	57.0	11.2	9.0	9.1
	Indians	**M**	32.0	33.6	35.3	65.4	63.6	59.9	2.6	2.3	4.2
		F	22.8	23.4	23.5	68.6	65.6	63.8	8.6	9.8	12.4

		Provinces of the Northern Division									
Bua	**Fijians**	**M**	38.0	36.2	34.8	58.8	60.1	62.0	3.0	2.5	2.9
		F	29.9	27.1	24.0	60.5	61.6	66.0	9.4	7.4	9.8
	Indians	**M**	30.3	27.7	23.4	67.7	70.0	73.3	18	2.2	3.2
		F	24.8	16.9	14.4	70.1	71.4	77.6	4.8	11.6	7.5
Cakaudrove	**Fijians**	**M**	40.1	37.7	38.0	56.5	58.2	58.2	3.3	2.8	3.2
		F	29.1	27.3	26.5	60.8	63.2	63.1	10.0	8.7	8.4
	Indians	**M**	28.6	27.3	30.3	69.3	70.8	66.2	2.1	1.4	3.0
		F	20.7	19.0	18.3	69.1	71.4	70.8	10.2	8.9	10.2
Macuata	**Fijians**	**M**	44.1	41.3	42.0	53.0	55.1	54.7	2.5	2.5	3.0
		F	29.7	28.5	31.8	60.7	61.3	58.7	9.5	8.7	9.0
	Indians	**M**	29.1	28.2	28.8	69.2	69.5	67.5	1.6	1.8	3.3
		F	21.7	19.4	20.8	68.7	69.0	65.3	9.6	10.4	13.5
		Provinces of the Eastern Division									
Kadavu	**Fijians**	**M**	35.8	32.0	34.6	59.5	62.9	61.9	4.6	4.1	3.3
		F	25.0	22.4	22.6	65.4	67.6	68.0	9.5	9.7	9.2
Lau	**Fijians**	**M**	31.8	27.0	31.8	64.0	68.5	63.2	4.1	3.5	4.6
		F	28.4	21.0	20.9	61.3	68.0	68.4	10.3	10.2	10.0
Lomaiviti	**Fijians**	**M**	36.4	33.3	38.2	59.7	62.1	56.7	3.8	3.5	4.2
		F	25.9	24.9	27.2	64.8	64.7	63.1	9.3	9.2	9.0
	Indians	**M**	26.7	32.9	38.1	69.2	62.1	56.7	3.8	4.1	5.1
		F	32.6	32.9	28.0	60.6	58.2	61.7	6.2	8.2	10.3
Rotuma*	**Rotuma District**	**M**	37.4	34.3	35.4	55.5	59.6	55.3	7.1	4.7	7.4
		F	27.3	25.8	24.8	57.6	60.2	61.1	15.1	12.2	13.3

Note * Indices are for Rotuma District

3.2. Married

From the basic data on marital status by age and sex at the national level, it appears that, in the lower age groups the proportions married females are significantly higher than the proportions married males. This pattern is expected. For males, the highest proportions married are reached around age 45 but for females at a slightly lower age. The proportions married decline after these peak ages. This is the result of dissolution of marriage through death (widowhood) and divorce.

It will be realized that the proportions never married and married are important determinants of fertility. This also applies to the age at first marriage. Unfortunately, in Fiji, the age at first marriage derived from CRS data is not a very good determinant of fertility. As has been pointed out, the CRS does not register consensual (de-facto) unions. Consequently, since 1946, an index of the age at first marriage has been derived indirectly from census data concerning never married males and females by age in five-year age groups. This index is referred to as the

Singulate Mean Age at Marriage (SMAM). An example of the computational procedure using 2007 census data for Fijian males and females in 2007 is given in Appendix C.[37]

The national SMAMs (in years) by sex for the main ethnic groups, as derived from census data (proportions never married in five-year age groups) since 1946, are presented in Table III-2a. As mentioned before, Census Reports before 1986 do not provide basic tabulations concerning marital status by age (in five-year age-groups) at the provincial level and these tables can, at this stage, not be produced anymore.

Table III-2a: Singulate Mean Age at Marriage (years) by sex and ethnicity derived from all censuses since 1946

Census	Sex	Total Population	Fijians	Indians
1946	**M**	22.5	25.8	18.3
	F	19.0	22.1	15.4
1956	**M**	23.9	26.0	21.1
	F	20.2	21.3	18.1
1966	**M**	24.7	26.1	23.4
	F	21.1	22.4	20.3
1976	**M**	23.9	26.0	23.7
	F	21.7	22.3	21.3
1986	**M**	25.3	26.6	24.3
	F	22.5	23.4	21.6
1996	**M**	26.1	27.0	25.2
	F	22.9	23.9	21.6
2007	**M**	27.7	28.2	27.0
	F	24.1	24.7	23.0

In 1946, the SMAM for Fijians was very significantly higher than that for Indians, especially in the case of females. Between 1946 and 1986, the SMAM for Fijian males and females did not change very much. In the meantime, the SMAM for Indians increased significantly, particularly in the case of Indian females. Since 1986, the SMAM has increased for all subgroups of the population. In 2007, the enormous difference in age at first marriage of Fijians and Indians that existed in 1946 has almost disappeared.

Table III-2b presents SMAM values at the provincial level by sex and ethnicity.

[37] This technique was devised by Hajnal, 1953.

Table III-2b: Singulate mean age at marriage (years) at the provincial level by sex and ethnicity derived from 1986, 1996 and 2007 Census data

Province	Year	Fijians			Indians		
		1986	1996	2007	1986	1996	2007
Fiji	**M**	26.6	27.0	28.2	24.3	25.2	27.0
	F	23.4	23.9	24.7	21.6	21.6	23.0
Provinces of the Western Division							
Ba	**M**	26.3	26.4	27.9	24.4	25.3	27.2
	F	23.3	23.7	24.7	21.7	21.6	22.9
Nadroga	**M**	26.9	27.0	28.3	24.2	25.3	27.3
	F	23.4	23.8	25.1	21.5	21.3	22.3
Ra	**M**	26.4	26.5	27.5	23.9	25.7	27.1
	F	22.8	22.8	23.4	21.7	21.2	22.8
Provinces of the Central Division							
Naitasiri	**M**	26.2	27.1	28.3	24.8	25.5	26.8
	F	23.0	24.3	25.1	22.1	22.0	23.1
Rewa	**M**	26.9	27.6	28.9	25.6	26.6	27.6
	F	24.4	24.8	25.6	22.7	23.1	25.0
Tailevu	**M**	26.6	27.4	28.1	25.4	25.6	27.7
	F	23.6	24.3	24.6	22.0	21.8	22.8
Namosi	**M**	27.8	27.1	28.6	-	-	-
	F	23.2	23.7	24.6	-	-	-
Serua	**M**	26.5	25.9	28.7	24.6	26.0	27.2
	F	23.4	24.2	25.1	21.7	22.2	23.0
Provinces of the Northern Division							
Bua	**M**	25.9	27.2	27.7	22.7	23.5	24.9
	F	23.1	24.0	23.4	20.4	20.1	20.8
Cakaudrove	**M**	27.2	26.8	28.0	22.8	23.8	26.3
	F	23.5	22.9	23.5	20.7	20.6	21.0
Macuata	**M**	27.2	27.1	27.9	22.6	23.5	25.9
	F	22.8	22.8	23.9	20.6	20.7	22.2
Provinces of the Eastern Division							
Kadavu	**M**	26.4	26.9	26.9	-	-	-
	F	22.6	22.6	23.0	-	-	-
Lau	**M**	25.9	26.1	26.7	-	-	-
	F	23.4	23.4	22.3	-	-	-
Lomaiviti	**M**	26.2	26.6	28.8	24.6	25.2	28.8
	F	22.3	22.6	24.2	23.8	23.6	21.5
Rotuma*	**M**	24.9	28.0	26.6	-	-	-
	F	23.0	22.9	23.8	-	-	-

Note * Indices are for Rotuma District

3.3.Dissolution of marriage

Marriage can be dissolved through the death of one of the partners (widowhood) and through divorce. Unfortunately, the early Census Reports do not distinguish between divorced and separated. The 2007 Census makes this distinction.

The proportion widowed by age and sex conforms to the expected pattern. The proportions widowed females are much higher than the proportion widowed males. This applies to Fijians as well as Indians. The difference between the proportions increases very drastically with increasing age. This is the result of differential mortality for males and females.

IV. LABOUR FORCE, EMPLOYMENT AND UNEMPLOYMENT

Labour force information, cross-classified with other key census variables like age, sex, education, ethnicity, and geographic sector for the main geographic subdivisions of the country are essential for effective policy making and planning. Most censuses include a few questions concerning the labour force. This is also the case in Fiji. However, the 1996 and especially the 2007 Census collected somewhat more information on the characteristics of Fiji's labour force. In this chapter, the results of the analysis of the labour force data from these two censuses are presented.[1] This analysis provides users with a basic picture of the labour force, employment and unemployment situation and trend in the country.

More detailed information concerning the labour force situation in Fiji should be provided by the Department of Labour and Industrial Relations. However, unlike the Department of Health and the Department of Education, this department does not have a nationwide network for the collection of labour force statistics. In the absence of complete and accurate administrative statistics from this department, the main source for more detailed labour force information are the surveys conducted by the FBoS.

- Section 1 discusses the various sources of nation-wide labour force data in Fiji.
- Section 2 considers some of the issues with regard to the collection of labour force information in a census and particularly the problems connected with this approach.
- Section 3 introduces the classification of the labour force used in Fiji.
- Section 4 discusses the labour force questions included on the 2007 Census Interview Schedule.
- Sections 5 to 7 present an analysis of the labour force, employment and unemployment data from the 1996 and 2007 Censuses and the changes that have taken place.
- The final Sections 8 and 9 analyze the present employment and unemployment situation in somewhat more detail.

1. Data sources

In most western countries, a network of Labour Offices distributed throughout the country, routinely collect labour force information (particularly on unemployment). In Fiji, such a network is non-existent. Consequently, the Department of Labour and Industrial Relations does not and cannot provide basic labour force information on a continuous basis.

[1] The detailed results of the analysis of the labour force data from the 1996 Census were never published and they are therefore also included in this chapter.

Because of this lack of service (administrative) statistics concerning the labour force, this information must be collected through other sources. The FBoS has its own data collection systems of labour force data. Firstly and most importantly, the Bureau collects labor force data by means of Labour Force (Employment and Unemployment) Surveys. Surveys were carried out during the periods 2004-2005 and 2010-2011. Unfortunately, these surveys are based on a relatively small sample of the population and they only provide statistically meaningful results at the national and divisional level, as well as for the geographic sectors and not at the provincial and lower level.

Consequently, In Fiji, the only data source that provides valid, albeit limited labour force information at the provincial and lower level is the national census.

2. Collection of labour force data in a census

This section discusses some of the basic issues and problems connected with the collection of labour force statistics in a census.

2.1. Household versus individual interview schedule or questionnaire

Censuses use either a household or individual interview schedule or questionnaire. A household interview schedule/questionnaire records information for all household members on one single sheet of paper. This restricts the number of questions that can be included in the census.

During the preparation phase of the 2007 Census (as well as all previous censuses) the FBoS decided that it would not be feasible to conduct the census using an individual interview schedule. Because of limited space on a household interview schedule, the number of questions on the various census topics had to be kept to a minimum. This is particularly important with regard to the labour force section on this schedule. In order to get a basic picture of the labour force, employment and unemployment situation in the country, this section requires relatively much space.

2.2. System of labour force statistics

The 1986 and 1996 censuses as well as the labour force surveys that have been conducted in Fiji used the International Labour Force Classification of Labour Force Statisticians (ICLS).[2] Because of the importance of comparability, the ICLS definitions of the labour force were once again adopted in 2007. However, some users of census information insisted that the census should also attempt to measure unemployment using the ILO “availability” criterion. Although, it was realized that the use of the availability criterion introduces a certain amount of vagueness and confusion in the measurement of unemployment, particularly in a census interview situation, it was decided to measure unemployment according to this availability criterion as well.

[2] This classification was introduced in 1982.

2.3. Time reference of labour force data

Labour force measurement can focus on:

- Usual activity: This refers to a long reference period of usually one year.

  Or:

- Current activity: This refers to a short reference period of usually one week.

Both approaches have their advantages and disadvantages. Most countries do, however, prefer the current activity approach. One important reason for this is that information concerning occupation; industry and employment status is linked with current activity. Moreover, the current activity approach is usually chosen in countries where only a very small proportion of persons are engaged in seasonal activities. On the other hand, in countries where a large proportion of people is engaged in seasonal activities), the usual activity approach is sometimes considered as more appropriate.[3] However, in these cases, both approaches, usual and current activity are normally utilized simultaneously.

In Fiji, seasonal labour does exist, mainly in the sugar industry (and to some extent in the tourist industry as well). However, with regard to the sugar industry, activities often take up a significant part of the year. Moreover, a large proportion of the persons involved in the harvest consist of family labour. In Fiji, distortions in the current activity data, caused by involvement in seasonal activities are considered as not being very significant. Consequently, in 2007, the FBoS has, like the previous censuses, adopted the current activity approach. The reference period was once again one week, or more precisely, the week before the census.

2.4. Age cut-off point for labour force questions

The age cut-off point for labour force questions in a census/survey, recommended by the ICLS is age 15. All previous censuses and surveys in Fiji used this cut-off point. Nevertheless, some members of the Users Advisory Committee insisted that the 2007 Census should attempt to collect information on child labour in Fiji and they argued that the age cut-off point should be lowered to age 10. Opponents maintained that children below age 15 should be full time at school and that child labour is illegal. They argued that census respondents should not be asked to report illegal activity.

Unfortunately, there is often a wide gap between theory and practice. For instance, in Fiji, it is common to see young children under the age of 15 at work, i.e. as shoeshine boys, wheelbarrow boys, bottle collectors etc. Moreover, many rural Class 8 school dropouts are engaged in subsistence activities. It is widely believed that, child labour is on the increase in Fiji. In order to capture this, the FBoS finally decided to decrease the age cut-off point during the 2007 Census from age 15 to age 10. However, since all previous censuses used the age 15 cut-off point, all

[3] In the South Pacific Region this is sometimes the case in countries with a very extensive plantation sector i.e. in Papua New Guinea.

comparisons in this chapter between the labour force situation in 2007 with that at the time of previous censuses are necessarily restricted to the population age 15 and over.

2.5. Some shortcomings and strengths of labour force data collected in a census.

Analysts and users of labor force information should be aware of the shortcomings of this information. These shortcomings are particularly related to the census interview situation. Contrary to the situation during a survey based on a representative sample of the population, in a nation-wide census:

- A large field staff (enumerators and supervisors) is employed. Although, this census field staff is properly trained in the use of the census Interview Schedule, most of them do not have any specialized knowledge concerning the topics on which the census seeks information. This applies first of all to labor force information.

- The interview is often conducted with one (senior) member of the household only. In most cases this is the head of household or his/her spouse. This person becomes the "proxy respondent" for all other (often absent) members of the household. Although data quality tests suggest that the census information, including that on the labour force is of reasonable quality, it is clear that more detailed and probably more accurate information can be obtained during a survey interview with the selected respondents and carried out by an interviewer specialized in the survey topics. For this reason, the census should not attempt to collect specialized information. This includes detailed labor force information i.e. concerning underemployment, time worked etc. The FBoS collects this information in specialized surveys on a sample basis.

On the other hand, contrary to information collected in surveys based on a sample of the population, census information is not affected by sampling errors and it is available for the smallest geographic subdivisions of the country.

3. Classification of the labour force

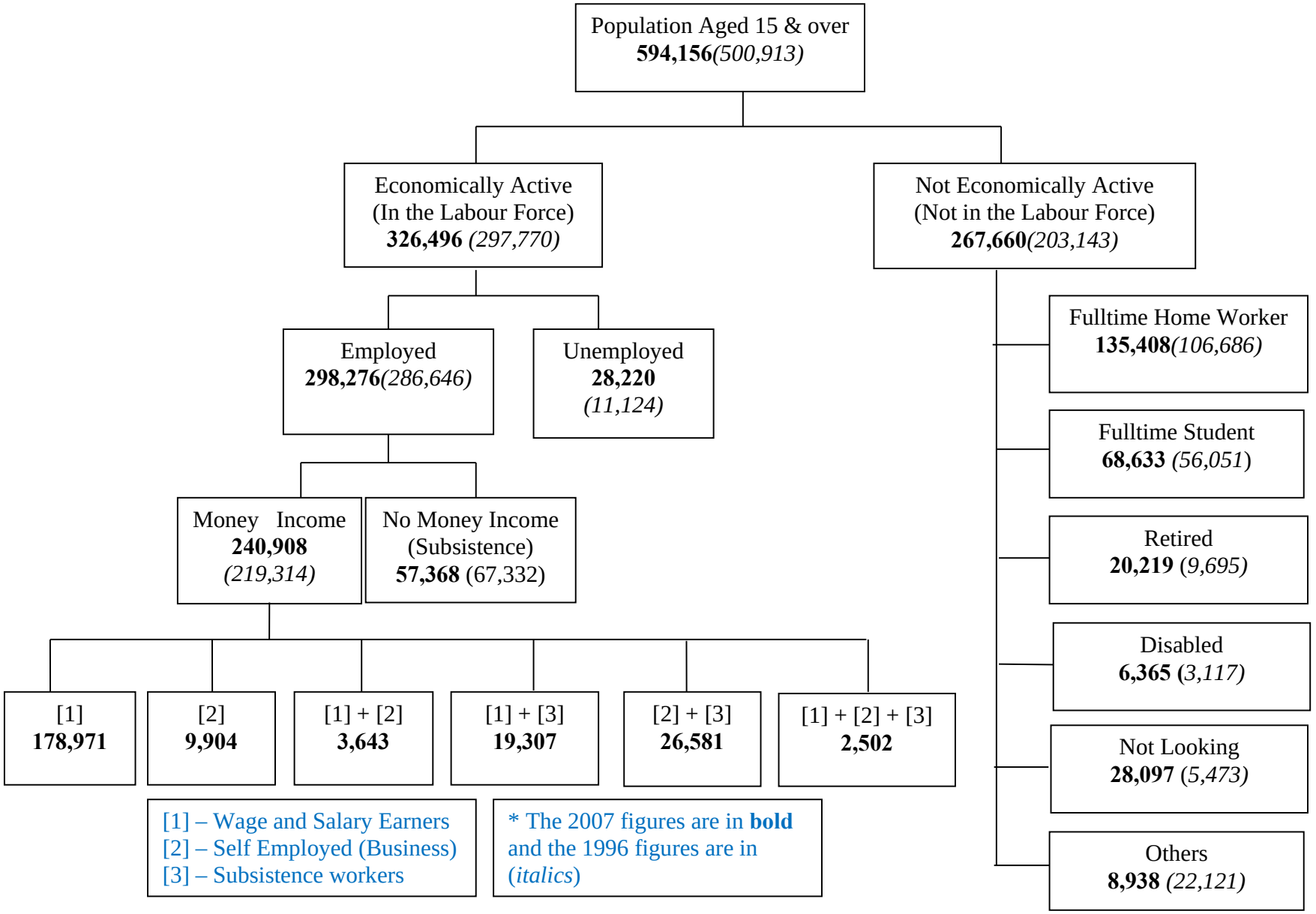
Figure IV-1 presents a classification of the labour force used in Fiji, during the 1996 and 2007 Census.

Firstly, the potentially economically active population (age 15 and over) is divided into those who are:

- In the labour force (the economically active population)

- Not in the labour force (the not economically active population)

Figure IV-1: Classification of the labour force used in the 1996 and 2007 Censuses*



The International Classification of Labor Force Statisticians (ICLS) defines the labour force as:

> "All persons of either sex who furnish the supply of labour for the production of goods and services as defined by the United Nations System of National Accounts and Balances during a specific time period.

The labor force is further subdivided into the:

- Employed
- Unemployed.

Users of labour force statistics are reminded that unemployment can be measured in several ways. The most common ones are based on definitions devised by the ICLS and the ILO. The following table explains the difference between the two approaches towards unemployment measurement.

ICLS criteria: A person is unemployed if during the reference period, he/she	**ILO criteria: A person is unemployed if during the reference period, he/she**
-Did not work	-Did not work
-Was available for work	-Was available for work
-Was actively looking for work	-

According to the ICLS system, there is therefore a third requirement for unemployment. A person must, during the reference period, be actively looking for work.

As mentioned, during previous censuses in 1986 and 1996, Fiji adopted the ICLS system. The main reason is that it was thought that the concept "available for work" is rather vague and difficult to operationalize. It was argued that, given the right conditions, virtually everybody who has no money income (subsistence workers, home workers etc.) might, given the right conditions, be inclined to say that they are available for work and would therefore join the ranks of the unemployed. It was felt that the use of the concept "available for work" may be more suitable for a survey interview situation, using specialized interviewers who actually have a face-to-face interview with all persons selected in the sample. This is not the case in a census. Since most census information is based on reports of proxy-respondents, census questions should be straightforward and leave no room for vagueness.

In order to maintain comparability with the labour force indices from previous censuses, it was decided that the 2007 census should once again attempt to establish the level of unemployment according to the same ICLS definition, used in 1986 and 1996. However, after much weighing of the pros and the cons, it was finally agreed that, given a reasonably effective field operation, information regarding "availability for work" might, at least in theory shed additional light on the unemployment situation in the country. It was therefore decided to attempt to get a picture of the "inactive unemployed" (those available for work but not actively looking for work).

However, since the ICLS and ILO unemployment measures provide a very different picture of the level of unemployment in Fiji, particularly in the urban sector, these different measures must be considered with the utmost caution. Confusion, for instance caused by a comparison of unemployment in 2007 according to the "availability criterium" of the ILO with unemployment at the time of previous censuses measured according to the ICLS definition should be avoided at all cost.

4. 2007 Census questions

The labour force section of the 2007 Census Interview Schedule was designed to provide a simple nationwide framework of the economically active population (labour force) and the not economically active population. All questions in the labour force section of the 2007 Interview Schedule refer to a reference period of one week, viz. last week, which is the week before the census. The questions are briefly discussed below.

4.1. The employed

The first two questions in the labour force section of the 2007 Census Interview Schedule (D19a and b) attempt to establish whether eligible respondents (those aged 10 years and over) did, during the reference period, any work for money, payment in kind or subsistence. They were given the following options:

(1) Work for money

(2) Work to support the household by producing goods for sale

(3) Work to support the household by producing goods for own consumption

All eligible respondents were asked, if applicable, to select more than one option. The possible combinations are:

- 1
- 2
- 3
- 1 and 2
- 1 and 3
- 2 and 3
- 1, 2 and 3

Those who during the reference period

- Did not do any work (Answer to question D19a is "No")

  And those

- Only involved in work to support the household by producing goods for own consumption (Answer to question D19b is only "3")

were not asked questions D 20 – D23. These categories of respondents are directed to question D 24 concerning unemployment.

4.1.1. Work for money

This category includes all persons involved in activities that finally return money to the person, household or the company. Thus, beside wages/salary or business incomes, persons producing goods for sale, growing crops, catching fish, collecting shells or other things for sale are involved in money activities. This also applies to a person who sells his services i.e. repairs things like cars or builds houses, etc. In other words, persons with money income consist of:

- Wage/salary earners
- Self-employed (business)

Note All those who, during the reference period (last week) were temporarily absent from work because they were on leave, sick, on strike, involved in a labour dispute etc. have been included in the category employed. They are referred to as the "inactive employed". This category typically constitutes at least ten percent of all the employed. Examples are a teacher who is on a holiday, a public servant who is sick, a factory employee who is on strike etc. These persons were regarded as having worked during the reference period.

For those who work for money (money and other compensation workers), questions D 19a and b are followed by a series of questions (D20 – D23) that refer to Occupation (Question D20), Industry (Question D21a-c), Employment status (Question D22) and Mode of payment (D23). The following explains questions D20-D23:

➢ Occupation

Occupation refers to the kind of work or the main job or the main task performed by the respondent during the reference period of one week before the census. In order to classify the occupation of all persons with money income as well as other compensation workers correctly, enumerators were instructed to describe their occupation as fully and precisely as possible. The FBoS has used the Fiji Islands Standard Classification of Occupations

(FISCO) 1995 for the coding of this information. This classification has been modified for the 2007 Census.

- Industry

Industry refers to the kind of business respondents are involved in. As in the case of "occupation", information concerning "industry" has only been of money and other compensation workers. Once again, it has been attempted to obtain a complete and accurate description of the industry or type of business the respondents work for. This can be a company, firm, organization, institution or government department. Industry information has been coded using the Fiji Islands Standard Industrial Classification (FISIC) modified for the 2007 Census.

- Employment status

Employment status refers to the class of worker the respondent belongs to. The precoded answers on the 2007 Interview Schedule include:

- Employee
- Employer
- Self employed
- Unpaid family worker
- Other specify

As in the case of occupation and industry, the question on employment status was restricted to money and other compensation workers.

- Employee

An employee is everyone who receives a wage or salary for his/her work. For instance, all civil servants and other persons employed by government in whatever capacity are employees. The same applies to all persons who work for an individual, a business etc. as long as they receive a wage or salary for their labour.

- Employer

An employer is a person who employs one or more persons to work for him/her. He/she may be the head of a firm, a shop or any other business. They are the head of this firm/shop/business in the sense of owning it.

Note: A manager in a particular business who is him/herself employed in that business, is not an employer.

- Self-employed

  A self-employed person is a person who works independently in various trades and businesses. He/she works on his/her own account. He/she may own a family store, be a builder, a baker, a dressmaker, a commercial fisherman or a motor mechanic working for him/herself. A self-employed person does not employ other persons and he/she is not an employee.

- Unpaid family worker

  An unpaid family worker may be working in a business such as a family store and does not receive a wage. However, these family workers may receive payment in kind i.e. food.

➢ Mode of payment.

This question inquires about the manner in which eligible respondents were paid. As in the case of the previous questions on occupation, industry and employment status, this question was asked of money and other compensation workers only.

The precoded answers on the 2007 Census Interview Schedule are:

- *Daily*
- *Weekly*
- *Fortnightly*
- *Monthly*
- *By sale/job done*
- *Volunteer with allowance*
- *Other specify*

- Wage (or salary) earners

  These are paid in cash on a regular basis (i.e. weekly, fortnightly or monthly). The payment of a salary earner is usually assessed on an annual basis.

- Self-employed

  These persons are paid when they sell a product or a service (by sale). However, not all self-employed persons receive a reward in cash.

  Note: Some self-employed persons are paid on a contract, task or piece of work basis (by job done). This category includes all casual workers.

The above information on occupation, industry, employment status and mode of payment is available for all respondents who answered Question D19b with any of the following: (1), (2), (3), (1 and 2), (1 and 3), (2 and 3), (1, 2 and 3).

4.1.2. Farming, fishing or collecting for household consumption or subsistence only.

Respondents who answered question D19b with only "3" are those who, during the reference period were economically active but received no money income. They were only engaged in subsistence activities or in work to support their household by producing goods for consumption. According to the ICLS definition, those respondents who are solely engaged in subsistence activities (without any money income), are included in the category "employed". The questions concerning occupation, industry, employment status and mode of payment are not relevant for them. These respondents were directed towards question D24 to obtain further information.

In conclusion, the three categories:

(1) Those with money income (wage/salary or self-employed)

(2) Those engaged in subsistence activities and

(3) The unemployed

constitute the economically active population or the labour force.

4.2. The unemployed

According to the ICLS definition, a respondent has to meet three criteria in order to be considered as unemployed. These three criteria are that the person was during the reference period:

(1) Without work

(2) Available for work

(3) Had been actively looking for work or in other words has taken steps to seek employment

The crucial question is what should be considered as evidence of "looking for work". Censuses and surveys in Fiji use a very broad definition of "looking for work". Activities that are accepted as evidence of looking for work include:

- Application letters to employers
- Asking for work at work sites
- Seeking assistance from relatives or friends to find a job
- Request for a loan from a financial institution to set up a business etc.

However, during the 2007 census, unemployment has not only been measured according to the ICLS definition but also according to the ILO definition. According to the latter definition, persons are unemployed if they did not work during the reference period and were available for work but did not actively look for work.

On the 2007 Census Interview Schedule, those respondents who, answered:

- Question D19a with "no" (these respondents did not do any work during the reference period)

  and

- D19b with only "3" (during the reference period these respondents worked to support their household by producing goods for consumption)

were directed towards question D24 a:

"Did this person actively look for work?"

- If they answered this question with yes, they were directed to question D24c:

"Was this person available to start work?"

- If they answered question D24a with "no", they continued answering question D24b. In other words, if respondents did not actively look for work, it was established whether, they belonged to any of the not economically active categories and whether they were available for work.

The answers to these questions make it possible to classify the unemployment status of these respondents according to the ILO definition.

4.3. Not economically active

Those who answered question D24a:

"Did this person actively look for work?"

with "no", continued to answer question D24b:

"If 'no' why didn't this person actively look for work?"

For this question they were given 7 precoded answers. These options constitute the sub-categories of the "not economically active (or "not in the labour force").

- Full time home worker

  Home workers can either be female or male. They are engaged in domestic duties like cooking, cleaning the house, looking after children etc. However, in the South Pacific Region, especially in Melanesia, including Fiji, many home workers, especially women, combine their domestic duties with other work, particularly growing food in their garden, fishing, and collecting food from the sea for subsistence (household consumption). These women are classified as subsistence workers. Domestic employees (house girls) have been classified as being in paid employment, even if their wages are far below the minimum urban wage.

- Full time student

  During the 2007 Census, the category of full time students comprised those who attended an educational institution at any level on a full-time basis. In Fiji, a very large proportion of persons under the age of 20 fall into this category. The category "full time student" in this classification is a subcategory of the labour force category "not economically active". Some students are, however, economically active. They have been classified under the appropriate category and not as full time student. This implies that the total number of persons categorized as full time students is less than the total number of students enrolled in educational institutions.[4]

- Retired

  These persons are retired from the public or private sector and are not involved anymore in any money-making activity. In many cases, these retired persons receive an income (a pension) from a former job. In Fiji, many retired persons are, however still involved in subsistence activities. They support their household by producing goods mainly for consumption of their own household.

- Disabled

  These are persons suffering from some form of permanent mental or physical disability. Because of this disability, they are unable to be engaged in any economic activity. From the point of view of labour force statistics, it is important that those who can be considered as disabled but are engaged in any economic activity are classified as wage earner, subsistence farmer or whatever the case may be. It is therefore important that users realize that this category does not include all disabled persons age 10 and over. The 2007 Census Interview Schedule included a separate section on disability.

- Not looking for work

  These respondents have given up looking for work since they believe that work that is suitable for them is not available.

[4] The census questions concerning education and training provide a complete picture of the educational situation in the country.

- Other, specify

  During censuses in the past there has often been a tendency to classify persons with an uncertain labour force status as "Others". Confusion often arises because the information is provided by a proxy-respondent. Detailed analysis of the category "Others" suggests that this happened in particular in the case of young respondents (especially young males under the age of 25) who do not go to school, are at first sight not engaged in any economic activity (including subsistence farming or fishing) and have not taken any action to find a job. In reality, in the rural sector, most of them are probably engaged in some kind of activity. It will be realized that, in labour force statistics, this category "Others" is a very unsatisfactory rest category. During the 2007 Census, all enumerators were therefore instructed to check very carefully before classifying any respondent as "Other".

5. Change in labour force status between 1996 and 2007

Section 5 compares the labour force structure in 1996 and 2007. Since, in 1996, the labour force questions were asked of all persons age 15 and over, the comparisons refer to the population in this age group. The following Tables IV-1a to c present the relative (%) change during the intercensal period in the number of persons age 15 and over in each of the sub-categories of the labour force.

5.1. Population by sex

Table V-1a shows that the total population age 15 and over increased by 18.6 percent during the 1996-2007 intercensal period.[5] Growth of the economically active population, (labour force) during this period was only about half of this benchmark figure (9.6 %), whereas growth of not economically active population (population not in the labour force) was almost double that of the total population age 15 and over (31.7 %).

The picture becomes more unfavorable when intercensal change for the two main components of the labour force, the employed and unemployed are considered. Growth in employment during the intercensal period was only marginal (4.1 %). This is, however, mainly due to the substantial intercensal decrease in the number of persons making a living from subsistence only. Unemployment increased very drastically (153.7%). The number of unemployed in 2007 is more than double of what it was in 1996.

[5] Due to demographic change during the intercensal period, especially decrease in fertility, the average annual growth rate of the population age 15 and over (1.5 percent) is significantly higher than the average annual growth rate of the total population during the same period, 0.7 percent.

Table IV-1a: Change in the labour force status of the population age 15 and over by sex between 1996 and 2007

Labour Force Category	1996 Census			2007 Census			Change (%)		
	P	M	F	P	M	F	P	M	F
Pop. age 15+	**500,913**	**252,722**	**248,191**	**594,156**	**301,518**	**292,638**	**18.6**	**19.3**	**17.9**
1. Econ. Active	297,770	200,052	97,718	326,496	217,168	109,328	9.6	8.6	11.9
a. Employed	286,646	194,350	92,296	298,276	202,401	95,875	4.1	4.1	3.9
(1) Money inc.	219,314	166,299	53,015	240,908	174,599	66,309	9.8	5.0	25.1
-No subs.	130,752	94,124	36,628	192,518	135,155	57,363	47.2	43.6	56.6
-With subs.	88,562	72,175	16,387	48,390	39,444	8,946	-45.4	-45.3	-45.4
(2) Only Subs.	67,332	28,051	39,281	57,368	27,802	29,566	-14.8	-0.9	-24.7
b. Unemployed	11,124	5,702	5,422	28,220	14,767	13,453	153.7	159.0	148.1
2. Not econ. act.	203,143	52,670	150,473	267,660	84,350	183,310	31.7	60.1	21.8
-F/T Home W.	106,686	2,591	104,095	135,408	10,448	124,960	26.9	303.2	20.0
-F/T Student	56,051	28,159	27,892	68,633	33,731	34,902	22.4	19.8	25.1
-Retired	9,695	6,094	3,601	20,219	12,985	7,234	108.6	113.1	100.9
-Disabled	3,117	1,826	1,291	6,365	3,629	2,736	104.2	98.7	111.9
-Not looking	5,473	3,653	1,820	28,097	18,143	9,954	413.4	396.7	446.9
-Others	22,121	10,347	11,774	8,938	5,414	3,524	-59.6	-47.7	70.1

With regard to the not economically active, home workers have remained by far the largest subcategory. Moreover, this category has increased much faster than the population age 15 and over as a whole. However, this growth is almost entirely due to the drastic increase in the number of male home workers. Nevertheless the category of home workers remains very much a female dominated category. Particularly depressing is the very large increase in the number of people who are not looking for work anymore.

Generally, the picture presented by the data in Figure IV-1a is disheartening. There is, however, some good news. The increase in the number of females with money income is increasing much faster than that of the population age 15 and over as a whole. It is also pleasing to see that there has been a very drastic decrease in the number of "Others". During the 2007 Census, enumerators were instructed to use this unsatisfactory rest-category only as a very last resort.

5.2. Population by ethnicity

Table IV-1b compares labour force development for the two main ethnic components of the population, the Fijians and Indians.

Table IV-1b: Change in the labour force status of the main ethnic groups age 15 and over between 1996 and 2007

Labour Force Category	1996 Census			2007 Census			Change (%)		
	All	Fij.	Ind.	All	Fij.	Ind.	All	Fij.	Ind.
Pop. Age 15+	**500,913**	**244,423**	**228,297**	**594,156**	**319,664**	**240,787**	**18.6**	**30.8**	**5.5**
1. Econ. Active	297,770	156,409	125,200	326,496	178,884	129,045	9.6	14.4	3.1
a. Employed	286,646	150,987	120,234	298,276	161,105	120,068	4.1	6.7	-0.1
(1) Money inc.	219,314	99,966	106,260	240,908	118,744	108,174	9.8	18.8	1.8
-No subs.	130,752	43,746	77,631	192,518	85,556	94,576	47.2	95.6	21.8
-With subs.	88,562	56,220	28,629	48,390	33,188	13,598	-45.4	-41.0	-52.5
(2) Only Subs.	67,332	51,021	13,974	57,368	42,361	11,894	-14.8	-17.0	-14.9
b. Unemployed	11,124	5,422	4,966	28,220	17,779	8,977	153.7	227.9	80.7
2. Not econ. act.	203,143	88,014	103,097	267,660	140,780	111,742	31.7	60.0	8.4
-F/T Home W.	106,686	41,544	60,511	135,408	67,235	62,653	26.9	61.8	3.5
-F/T Student	56,051	26,544	25,284	68,633	38,374	24,827	22.4	44.6	-1.8
-Retired	9,695	3,738	5,149	20,219	9,466	9,139	108.6	153.2	75.0
-Disabled	3,117	1,312	1,620	6,365	3,045	2,992	104.2	132.1	84.7
-Not looking	5,473	3,228	1,982	28,097	17,597	8,954	413.4	445.1	351.8
-Others	22,121	11,648	8,551	8,938	5,063	3,177	-59.6	-56.5	-62.8

In making a comparison between the data for Fijians and Indians, it must be kept in mind that, due to a very high level of out-migration of Indians during the intercensal period, growth of the Indian population aged 15 and over has almost come to a standstill.[6] It spite of that, it appears that, during the intercensal period, the Indian component of the population has, on the whole, fared somewhat better than the Fijian component. This applies amongst others to the increase in unemployment, and the increase in the number of people not looking for work anymore. The increase in the number of home workers is almost entirely a Fijian phenomenon.

5.3. Population by geographic sector

The last table in this series, Table IV-1c, compares labour force development for the rural and urban sector. As expected, the picture appears to be depressing for both sectors. However, as expected, judging from the change in the number of employed and unemployed, the population of the urban sector seems to be coping somewhat better than the population in the rural sector. It will also be noted that, although the number of urban persons engaged in subsistence activities only is decreasing, this number remains very significant. These people are undoubtedly mainly residing in the peri-urban areas of the cities and towns.

[6] This is discussed in Chapter I, which deals with the basic population characteristics, size, growth, distribution and density. The average intercensal growth rate (1996-2007) for Indians was -0.7 percent annually, whereas that of Fijians was 1.7 percent annually.

Table-IV-1c: Change in the labour force status of the population age 15 and over by geographic sector between 1996 and 2007

Labour Force Category	1996 Census			2007 Census			Change (%)		
	Total	Rural	Urban	Total	Rural	Urban	Total	Rural	Urban
Pop. Age 15+	**500,913**	**258,730**	**242,183**	**594,156**	**283,400**	**310,756**	**18.6**	**9.5**	**28.3**
1. Econ. Active	297,770	161,732	136,038	326,496	162,323	164,173	9.6	0.4	20.7
a. Employed	286,646	158,456	128,190	298,276	153,005	145,271	4.1	-3.4	13.3
(1) Money inc.	219,314	107,853	111,461	240,908	108,618	132,290	9.8	0.7	18.7
-No subs.	130,752	43,566	87,186	192,518	70,899	121,619	47.2	62.7	39.5
-With subs.	88,562	64,287	24,275	48,390	37,719	10,671	-45.4	-41.3	-56.0
(2) Only Subs.	67,332	50,603	16,729	57,368	44,387	12,981	-14.8	-12.3	-22.4
b. Unemployed	11,124	3,276	7,848	28,220	9,318	18,902	153.7	184.4	140.9
2. Not econ. act.	203,143	96,998	106,145	267,660	121,077	146,583	31.7	24.8	38.1
-F/T Home W.	106,686	56,056	50,630	135,408	67,289	68,119	26.9	20.0	34.5
-F/T Student	56,051	22,781	33,270	68,633	24,968	43,665	22.4	9.6	31.2
-Retired	9,695	4,037	5,658	20,219	7,879	12,340	108.6	95.2	118.1
-Disabled	3,117	1,929	1,188	6,365	3,448	2,917	104.2	78.7	145.5
-Not looking	5,473	2,225	3,248	28,097	13,337	14,760	413.4	499.4	354.4
-Others	22,121	9,970	12,151	8,938	4,156	4,782	-59.6	-58.3	-60.6

6. Change in labour force participation between 1996 and 2007

Labour force participation is expressed by means of labour force participation rates (LFPR). A LFPR for a particular age group (i) is defined as:

LFPR(i) = (Number Persons age i in the LF / Total Number Persons age i) x 100

The LFPRs by sex, ethnicity and geographic sector in 1996 and 2007 are presented in Table IV-2a, b and c. For 1996, these rates are given for five-year age groups starting from age 15 and for 2007 for five-year age groups starting from age 10. An overview of all these rates is also given in the corresponding Figure IV-2a, b and c.

The following comments refer to the information in these tables and figures:

- The LFPRs by sex in 2007 are somewhat lower than those in 1996. However this is mainly due to the lower LFPRs for males. The LFPRs for females have decreased less.

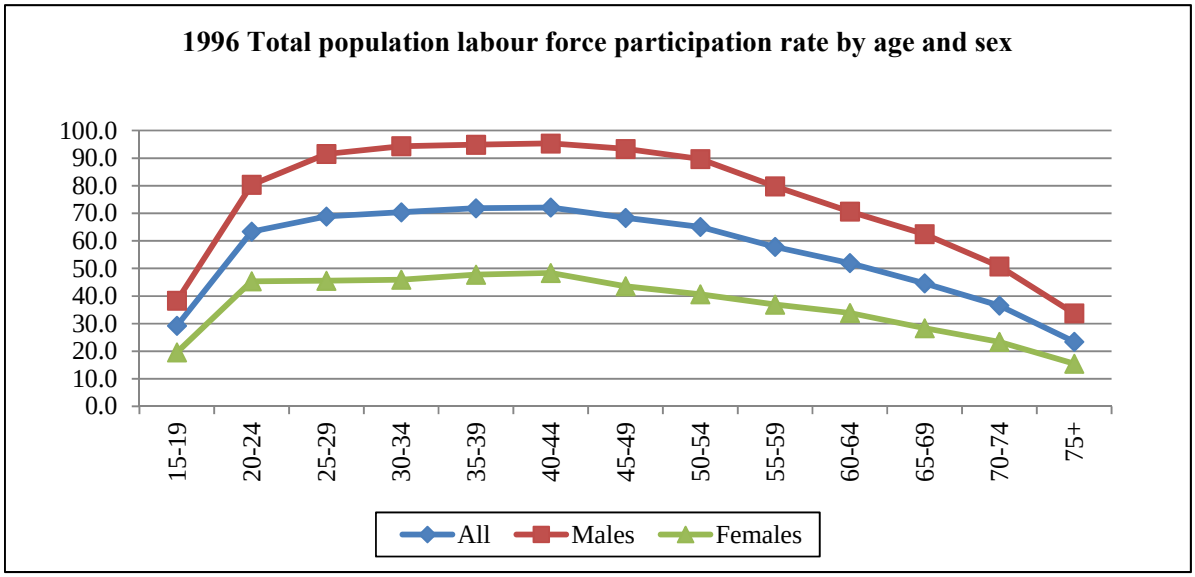
- The LFPRs for males are significantly higher than those for females. By international standards, the LFPRs for females in Fiji are, however, not low. This is mainly due to the fact that a significant number of females (mainly Fijian females) are engaged in subsistence activities and therefore included in the labour force.

Table IV-2a: LFPRs by sex derived from 1996 and 2007 Census data

Age	Persons			Males			Females		
	LF (Nr)	Pop (Nr)	LFPR (%)	LF (Nr)	Pop (Nr)	LFPR (%)	LF (Nr)	Pop (Nr)	LFPR (%)
1996									
0-14	0	274164	0.0	0	141209	0.0	0	132955	0.0
15-19	24438	83682	29.2	16503	43099	38.3	7935	40583	19.6
20-24	42413	66955	63.3	27668	34444	80.3	14745	32511	45.4
25-29	42462	61660	68.9	28629	31283	91.5	13833	30377	45.5
30-34	42811	60841	70.4	28987	30727	94.3	13824	30114	45.9
35-39	40068	55779	71.8	27057	28525	94.9	13011	27254	47.7
40-44	31856	44180	72.1	21295	22341	95.3	10561	21839	48.4
45-49	25347	37081	68.4	17250	18482	93.3	8097	18599	43.5
50-54	18661	28683	65.1	12810	14286	89.7	5851	14397	40.6
55-59	12863	22245	57.8	8660	10857	79.8	4203	11388	36.9
60-64	8033	15459	52.0	5372	7605	70.6	2661	7854	33.9
65-69	4801	10761	44.6	3208	5138	62.4	1593	5623	28.3
70-74	2323	6357	36.5	1550	3054	50.8	773	3303	23.4
75+	1694	7230	23.4	1063	3151	33.7	631	4079	15.5
Total*	297770	775077	38.4	200052	394201	50.7	97718	380876	25.7
2007									
0-9	0	160734	0.0	0	83274	0.0	0	77460	0.0
10-14	5423	82381	6.6	2883	42368	6.8	2540	40013	6.3
15-19	19639	79518	24.7	12783	40820	31.3	6856	38698	17.7
20-24	47785	80360	59.5	29789	41323	72.1	17996	39037	46.1
25-29	48936	73489	66.6	31552	37388	84.4	17384	36101	48.2
30-34	42600	63547	67.0	28262	32827	86.1	14338	30720	46.7
35-39	38102	56553	67.4	25440	28778	88.4	12662	27775	45.6
40-44	37554	56275	66.7	25521	28597	89.2	12033	27678	43.5
45-49	32342	50325	64.3	22568	25839	87.3	9774	24486	39.9
50-54	23624	40007	59.0	16577	20215	82.0	7047	19792	35.6
55-59	15640	31157	50.2	10916	15731	69.4	4724	15426	30.6
60-64	9196	24111	38.1	6376	11948	53.4	2820	12163	23.2
65-69	5577	16808	33.2	3803	8097	47.0	1774	8711	20.4
70-74	2832	10110	28.0	1904	4717	40.4	928	5393	17.2
75+	2669	11896	22.4	1677	5238	32.0	992	6658	14.9
Total*	331919	837271	39.6	220051	427160	51.5	111868	410111	27.3

Note * These are Crude Labour Force Participation Rates

Figure IV-2a: LFPRs by sex derived from 1996 and 2007 Census data



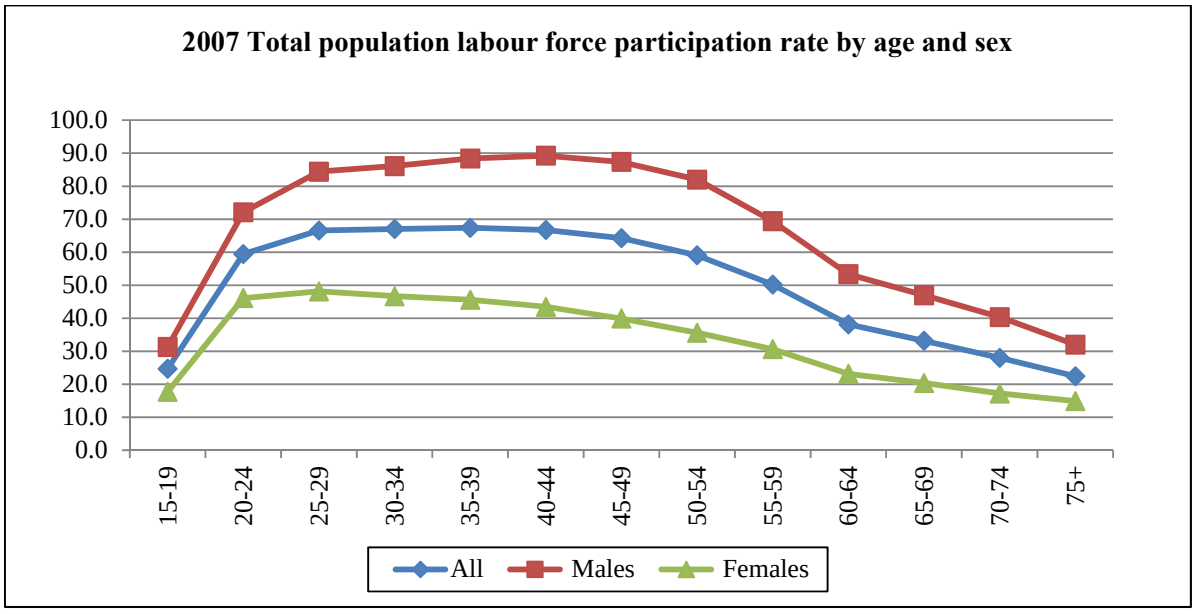
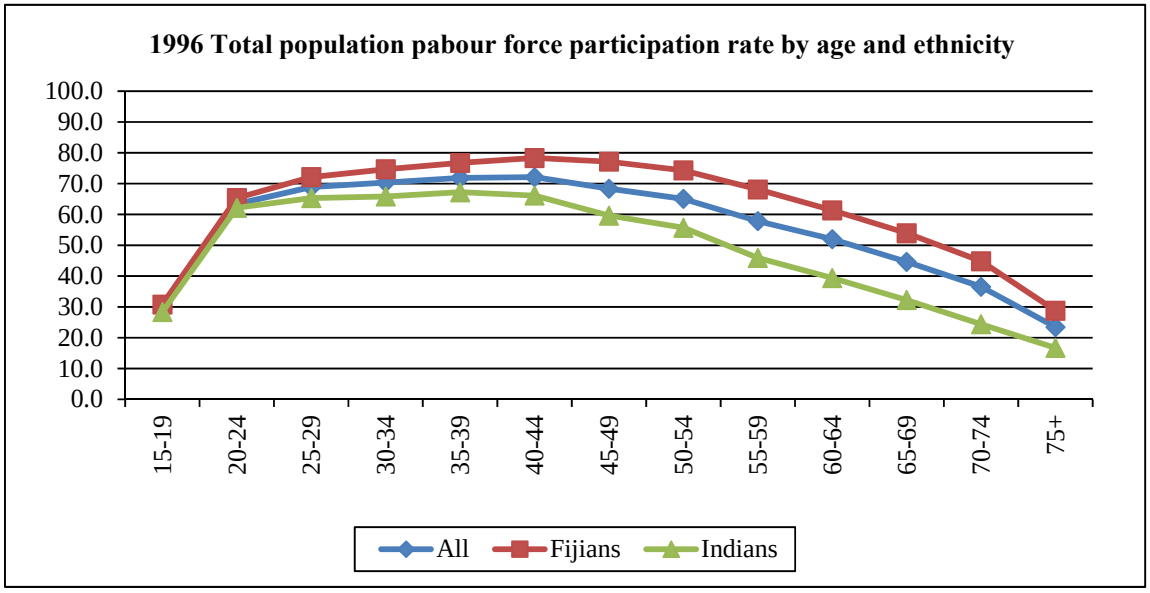


Table IV-2b: LFPRs by ethnicity derived from 1996 and 2007 Census data

Age	All			Fijians			Indians		
	LF (Nr)	Pop (Nr)	LFPR (%)	LF (Nr)	Pop (Nr)	LFPR (%)	LF (Nr)	Pop (Nr)	LFPR (%)
1996									
0-14	0	274164	0.0	0	149152	0.0	0	110521	0.0
15-19	24438	83682	29.2	12448	40436	30.8	11053	39011	28.3
20-24	42413	66955	63.3	21963	33638	65.3	18255	29372	62.2
25-29	42462	61660	68.9	22382	31039	72.1	17711	27121	65.3
30-34	42811	60841	70.4	22049	29539	74.6	18452	28041	65.8
35-39	40068	55779	71.8	19657	25626	76.7	18176	27048	67.2
40-44	31856	44180	72.1	15722	20075	78.3	14292	21620	66.1
45-49	25347	37081	68.4	13168	17073	77.1	10670	17896	59.6
50-54	18661	28683	65.1	10068	13550	74.3	7493	13457	55.7
55-59	12863	22245	57.8	7808	11466	68.1	4356	9493	45.9
60-64	8033	15459	52.0	5175	8436	61.3	2398	6091	39.4
65-69	4801	10761	44.6	3178	5895	53.9	1336	4147	32.2
70-74	2323	6357	36.5	1650	3681	44.8	551	2260	24.4
75+	1694	7230	23.4	1141	3969	28.7	457	2740	16.7
Total*	297770	775077	38.4	156409	393575	39.7	125200	338818	37.0
2007									
0-9	0	160734	0.0	0	106710	0.0	0	44820	0.0
10-14	5423	82381	6.6	3716	49365	7.5	1398	28194	5.0
15-19	19639	79518	24.7	11501	46074	25.0	7165	29017	24.7
20-24	47785	80360	59.5	25665	44553	57.6	19778	31415	63.0
25-29	48936	73489	66.6	25628	39165	65.4	20727	30288	68.4
30-34	42600	63547	67.0	23529	35115	67.0	16685	24873	67.1
35-39	38102	56553	67.4	20951	30708	68.2	14874	22576	65.9
40-44	37554	56275	66.7	20418	29745	68.6	14829	23271	63.7
45-49	32342	50325	64.3	17121	25126	68.1	13342	22459	59.4
50-54	23624	40007	59.0	12590	19594	64.3	9544	18183	52.5
55-59	15640	31157	50.2	8772	15620	56.2	5884	13718	42.9
60-64	9196	24111	38.1	5497	12457	44.1	3078	10175	30.3
65-69	5577	16808	33.2	3597	9193	39.1	1629	6602	24.7
70-74	2832	10110	28.0	1894	5713	33.2	743	3766	19.7
75+	2669	11896	22.4	1721	6601	26.1	767	4444	17.3
Total*	331919	837271	39.6	182600	475739	38.4	130443	313801	41.6

Note * These are Crude Labour Force Participation Rates

Figure IV-2b: LFPRs by ethnicity derived from 1996 and 2007 Census data



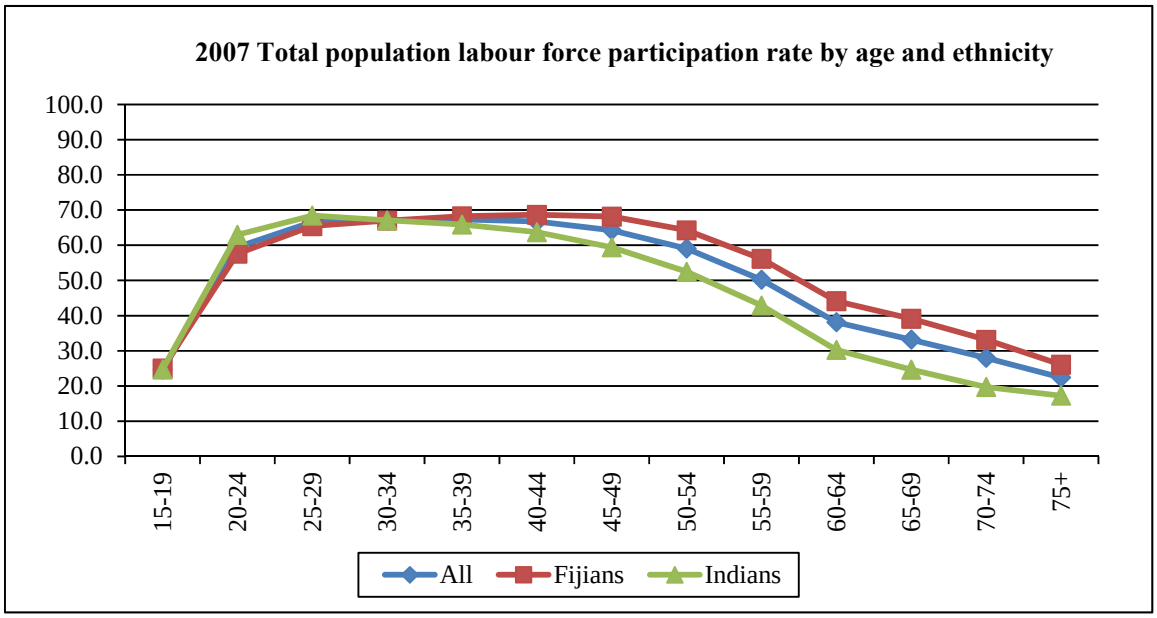
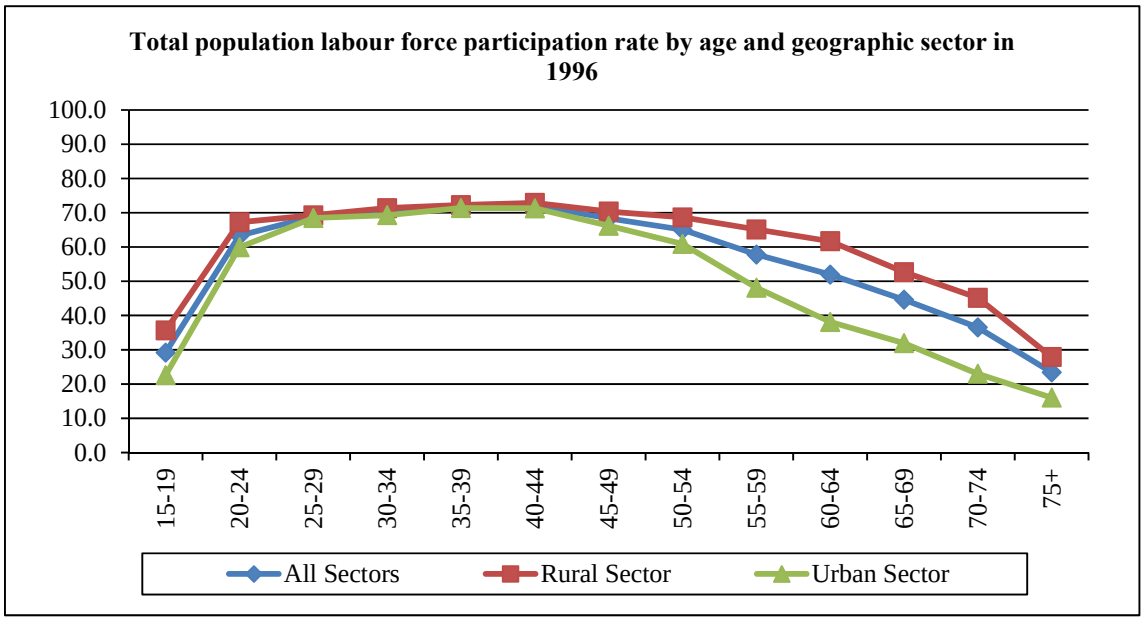


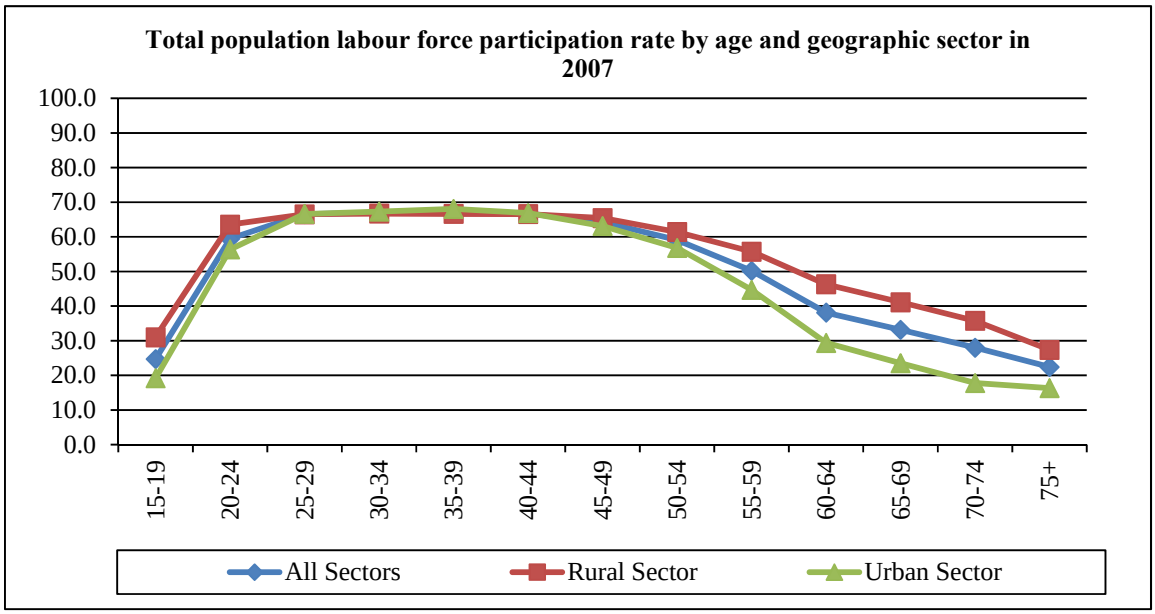
Table IV-2c: LFPRs by geographic sector derived from 1996 and 2007 Census data

Age	All Sectors			Rural Sector			Urban Sector		
	LF (Nr)	Pop (Nr)	LFPR (%)	LF (Nr)	Pop (Nr)	LFPR (%)	LF (Nr)	Pop (Nr)	LFPR (%)
1996									
0-14	0	274164	0.0	0	156852	0.0	0	117312	0.0
15-19	24438	83682	29.2	15083	42278	35.7	9355	41404	22.6
20-24	42413	66955	63.3	21032	31277	67.2	21381	35678	59.9
25-29	42462	61660	68.9	21440	30954	69.3	21022	30706	68.5
30-34	42811	60841	70.4	22784	31936	71.3	20027	28905	69.3
35-39	40068	55779	71.8	20813	28804	72.3	19255	26975	71.4
40-44	31856	44180	72.1	16265	22317	72.9	15591	21863	71.3
45-49	25347	37081	68.4	13423	19074	70.4	11924	18007	66.2
50-54	18661	28683	65.1	10564	15383	68.7	8097	13300	60.9
55-59	12863	22245	57.8	8260	12683	65.1	4603	9562	48.1
60-64	8033	15459	52.0	5596	9070	61.7	2437	6389	38.1
65-69	4801	10761	44.6	3462	6570	52.7	1339	4191	31.9
70-74	2323	6357	36.5	1754	3884	45.2	569	2473	23.0
75+	1694	7230	23.4	1256	4500	27.9	438	2730	16.0
Total*	297770	775077	38.4	161732	415582	38.9	136038	359495	37.8
2007									
0-9	0	160734	0.0	0	85545	0.0	0	75189	0.0
10-14	5423	82381	6.6	3589	43465	8.3	1834	38916	4.7
15-19	19639	79518	24.7	11494	37059	31.0	8145	42459	19.2
20-24	47785	80360	59.5	21935	34517	63.5	25850	45843	56.4
25-29	48936	73489	66.6	21833	32817	66.5	27103	40672	66.6
30-34	42600	63547	67.0	19974	29932	66.7	22626	33615	67.3
35-39	38102	56553	67.4	18167	27265	66.6	19935	29288	68.1
40-44	37554	56275	66.7	18731	28127	66.6	18823	28148	66.9
45-49	32342	50325	64.3	16206	24767	65.4	16136	25558	63.1
50-54	23624	40007	59.0	11933	19428	61.4	11691	20579	56.8
55-59	15640	31157	50.2	8636	15493	55.7	7004	15664	44.7
60-64	9196	24111	38.1	5770	12459	46.3	3426	11652	29.4
65-69	5577	16808	33.2	3789	9212	41.1	1788	7596	23.5
70-74	2832	10110	28.0	2056	5750	35.8	776	4360	17.8
75+	2669	11896	22.4	1799	6574	27.4	870	5322	16.3
Total*	331919	837271	39.6	165912	412410	40.2	166007	424861	39.1

Note * These are Crude Labour Force Participation Rates

Figure IV-2c: LFPRs by geographic sector derived from 1996 and 2007 Census data





- Generally, the LFPRs for Fijians are higher than those for Indians. However, between 1996 and 2007, the gap has narrowed. Moreover in the age range 20-34, Indian LFPRs are now higher than those for Fijians.

- During the intercensal period, the LFPRs for the rural as well as the urban sector have decreased but more so for the rural than for the urban sector.

- Until age 40, the LFPRs for the rural and urban sector are approximately the same. Beyond that age, there is a significant gap between the rural and urban LFPRs. As expected, for the elderly, the rural rates are significantly higher than the urban ones. This is undoubtedly mainly due to the fact that the elderly in the rural sector continue with their activities, especially in the case of subsistence work, whereas their urban counterparts gradually get retired and do not have the same opportunities for subsistence work.

- In 2007, a total number of 5,423 youths aged 10-14 were in the labour force. Of these, 2,883 are males and 2,540 females. Furthermore, 3,716 are Fijians and 1,398 are Indians and the remainder "Others". Finally, 3,589 are rural and 1,834 are urban. It appears that children age 10-14 engaged in child labour are mainly rural Fijian children and slightly more of them are male than female. A large proportion of these rural Fijian children are engaged in subsistence activities, probably after dropping out of school after class 8. It is believed that since child labour is illegal, many respondents (fathers or mothers) have been reluctant to report that their children aged 10-14 were not going to school and actually working. The above reported cases may be the tip of the iceberg.

Table IV-3 presents an overview of intercensal change in crude labour force participation by sex, ethnicity and geographic sector. The Crude Labour Force Participation Rate (CLFPR) is defined as:

CLFPR = (Number Persons in Labour Force / Total Population) x 100

Table IV-3: Comparison of Crude Labour Force Participation Rates by sex, ethnicity and geographic sector in 1996 and 2007

Geogr. Sector	Year	Total Population			Fijians			Indians		
		Pers.	Male	Fem.	Pers.	Male	Fem.	Pers.	Male	Fem.
All	**1996**	38.4	50.7	25.7	39.7	51.9	25.2	37.0	49.5	26.2
	2007	39.1	51.5	27.3	38.4	51.6	25.4	41.6	50.0	28.1
Rural	**1996**	38.9	48.5	30.7	41.2	50.2	31.6	37.6	45.9	29.5
	2007	40.2	46.5	28.2	38.7	48.4	28.0	36.1	43.9	28.4
Urban	**1996**	37.8	54.0	19.4	36.0	54.4	16.7	38.0	53.6	22.1
	2007	39.1	58.0	24.2	39.6	57.9	20.1	42.8	58.0	27.3

Like all crude rates, the significance of the CLFPRs is limited. As can be seen from Table and Figure IV-2, labour force participation is very much an age (as well as sex) specific phenomenon. Consequently, planners need the more detailed picture of labour force participation by age and sex. The CLFPRs in Table IV-3 are mainly provided for the sake of completeness.

7. Change in employment and unemployment between 1996 and 2007

The two components of the labour force (economically active population) are the employed and the unemployed. Section 7.1 compares the 1996 and 2007 employment and unemployment situation at the national level whereas Section 7.2 provides an inter-provincial comparison. Since the age cut-off point for the labor force questions in 1996 was age 15 (and not age 10 as in 2007), the comparisons refer to the population age 15 and over. Furthermore, it needs to be kept in mind that the employment and unemployment figures and rates presented in this section are based on the ICLS definition of employed and unemployed.

7.1. National level

Table IV-4 presents the number of employed and unemployed by sex, ethnicity and geographic sector at the time of the 1996 and 2007 Censuses. Moreover the unemployment rates for each of these populations are also included in this table. The unemployment rate is defined as follows:

Unemployment Rate = (Number Unemployed / Population in the Labour Force) x 100

The employment rates are not given in Table IV-4. They can easily be derived by taking the complement of the unemployment rates.

The following comments refer to the data in Table IV-4:

- Firstly, and most importantly, it appears that the unemployment rate for the total population has increased drastically during the 1996-2007 intercensal period from 3.7 percent to 8.6 percent. This increase may be slightly overstated since it is possible that the 2007 Census captured unemployment better than the 1996 Census. This does not alter the fact that unemployment has increased very significantly. This is not surprising, considering that Fiji experienced two coups during the intercensal period 1996-2007. These coups led to a downturn in the economy, job losses etc. In addition, many cane farmers lost their land during this period, due to non-renewal of land leases.

- Proportionally, during the intercensal period, losses in male and female employment were about the same. However in 2007 as well as in 1996, female unemployment is about two times higher than male unemployment.

- During the intercensal period, unemployment of Fijians has increased much faster than that of Indians. It appears that, with regard to unemployment, Fijians have been the main victims of the downturn.

Table IV-4: Employment and unemployment for the population age 15 and over by sex, ethnicity and geographic sector derived from 1996 and 2007 Census data

Ethnic Group	Yr	Employed (Number)			Unemployed					
					Number			Rate (%)		
		P	M	F	P	M	F	P	M	F
All Sectors										
Tot	**96**	286,646	194,350	92,296	11,124	5,702	5,422	3.7	2.9	5.5
	07	298,276	202,401	95,875	28,220	14,767	13,453	**8.6**	**6.8**	**12.3**
Fij	**96**	150,987	94,158	56,829	5,422	2,769	2,653	3.5	2.9	4.5
	07	161,105	103,996	57,109	17,779	9,545	8,234	9.9	8.4	12.6
Ind	**96**	120,234	90,204	30,030	4,966	2,563	2,403	4.0	2.8	7.4
	07	120,068	87,571	32,497	8,977	4,457	4,520	7.0	4.8	12.2
Rural Sector										
Tot	**96**	158,456	109,258	49,198	3,276	1,663	1,613	2.0	1.5	3.2
	07	153,005	107,013	45,992	9,318	4,869	4,449	5.7	4.4	8.8
Fij	**96**	94,310	59,469	34,841	1,373	689	684	1.4	1.1	1.9
	07	96,682	64,405	32,277	6,434	3,392	3,042	6.2	5.0	8.6
Ind	**96**	59,616	46,534	13,082	1,810	930	880	2.9	2.0	6.3
	07	51,276	39,195	12,081	2,677	1,354	1,323	5.0	3.3	9.9
Urban Sector										
Tot	**96**	128,190	85,092	43,098	7,848	4,039	3,809	5.8	4.5	8.1
	07	145,271	95,388	49,883	18,902	9,898	9,004	11.5	9.4	15.3
Fij	**96**	56,677	34,689	21,988	4,049	2,080	1,969	6.7	5.7	8.2
	07	64,423	39,591	24,832	11,345	6,153	5,192	15.0	13.5	17.3
Ind	**96**	60,618	43,670	16,948	3,156	1,633	1,523	4.9	3.6	8.2
	07	68,792	48,376	20,416	6,300	3,103	3,197	8.4	6.0	13.5

- Although rural unemployment in 2007 is still significantly lower than urban unemployment, it has, during the intercensal period increased almost three times. Although the level of unemployment of rural Fijian females is still below that of rural Indian females, the rate of increase in unemployment of rural Fijian females from 1.9 percent in 1996 to 8.6 percent in 2007 is particularly alarming. In comparison the increase in unemployment of rural Indian females during the same period was from 6.3 percent in 1996 to 9.9 percent in 2007.

- Although during the intercensal period, the increase in overall urban unemployment has been slightly lower than the increase in overall rural unemployment, the overall urban unemployment rate has now reached a very high level of 15.3 percent. The highest unemployment rate for all subgroups of the population is now 17.3 percent for Fijian females in the urban sector.

- The only subgroup of the population which, in 2007, has been able to keep its unemployment rate below 5 percent is the rural Indian males. In 2007, rural Indian males

have an unemployment rate of 3.3 percent, whereas the urban unemployment rate for Indians is now 6.0 percent.

7.2. Provincial level

Table IV-5 presents the 2007 unemployment rates by sex, ethnicity and geographic sector for each of the provinces.

Table IV-5: Unemployment rates (%) for the population of Fiji and its provinces by sex, ethnicity and geographic sector derived from 2007 Census data

Province	Geogr. Sector	Total Population			Fijians			Indians		
		Pers	Males	Fems	Pers	Males	Fems	Pers	Males	Fems
Fiji	**All**	**8.6**	**6.8**	**12.3**	**9.9**	**8.4**	**12.6**	**7.0**	**4.8**	**12.2**
	Rural	**5.7**	**4.4**	**8.8**	**6.2**	**5.0**	**8.6**	**5.0**	**3.3**	**9.9**
	Urban	**11.5**	**9.4**	**15.3**	**15.0**	**13.5**	**17.3**	**8.4**	**6.0**	**13.5**
		Provinces of the Central Division								
Naitasiri	**All**	13.4	11.5	16.8	15.2	14.1	17.1	10.8	8.3	16.2
	Rural	5.2	4.4	6.9	5.1	4.4	6.2	5.9	4.2	11.4
	Urban	15.0	13.0	18.7	18.6	17.4	20.5	11.1	8.6	16.5
Namosi	**All**	11.1	9.1	15.7	11.3	4.3	15.6	7.5	5.9	14.8
Rewa	**All**	10.6	8.8	13.3	13.5	11.8	16.0	6.2	4.5	9.3
	Rural	11.9	11.3	12.8	12.7	12.3	13.2	4.4	2.7	8.5
	Urban	10.5	8.5	13.3	13.7	11.7	16.4	6.3	4.5	9.4
Serua	**All**	11.3	8.8	17.1	13.0	10.2	18.6	8.9	6.6	15.9
	Rural	10.0	7.9	15.5	11.3	8.7	17.3	6.6	5.5	9.9
	Urban	13.1	10.2	19.1	17.4	14.9	21.3	10.8	7.4	19.5
Tailevu	**All**	10.2	7.8	15.0	11.3	9.1	15.3	7.9	5.2	14.9
	Rural	10.1	7.7	14.4	10.6	8.4	14.5	7.2	3.4	16.7
	Urban	10.6	7.9	16.4	15.2	12.5	19.7	8.2	5.9	14.2
		Provinces of the Eastern Division								
Lomaiviti	**All**	2.8	1.8	4.4	2.9	1.9	4.3	2.6	0.0	7.5
	Rural	2.1	1.4	3.2	2.1	1.4	3.3	0.0	0.0	0.0
	Urban	5.0	3.3	7.4	5.8	4.2	7.8	3.4	0.0	5.2
Lau	**All**	0.7	0.5	1.0	0.7	0.5	1.0	0.0	0.0	0.0
Kadavu	**All**	0.6	0.7	0.3	0.6	0.7	0.4	0.0	0.0	0.0
Rotuma	**All**	0.2	0.2	0.2	-	-	-	-	-	-

Provinces of the Northern Division										
Bua	**All**	1.6	1.5	1.6	1.6	1.5	1.6	1.5	1.6	1.2
	Rural	1.5	1.5	1.5	1,5	1.4	1.4	1.5	1.6	1.3
	Urban	3.4	2.7	4.6	3.8	3.0	3.5	0.0	0.0	0.0
Cakaudrove	**All**	3.4	2.6	5.1	3.4	2.9	4.6	2.5	1.2	5.5
	Rural	3.1	2.4	4.7	3.2	2.6	4.6	1.6	1.1	2.7
	Urban	5.0	3.7	7.7	5.9	6.4	4.9	4.0	1.3	11.2
Macuata	**All**	4.4	3.1	7.6	5.4	4.0	8.8	3.7	2.5	6.8
	Rural	3.1	2.2	5.7	3.9	3.0	6.5	2.5	1.6	5.1
	Urban	6.3	4.6	9.8	8.4	6.1	12.0	5.4	3.9	8.6
Provinces of the Western Division										
Ba	**All**	8.5	6.3	13.6	11.5	9.5	15.1	6.5	4.4	12.5
	Rural	6.1	4.3	11.1	7.6	5.6	12.1	5.2	3.6	10.4
	Urban	10.8	8.4	15.4	14.6	13.1	16.9	8.0	5.3	14.4
Nadroga/Navosa	**All**	9.0	7.0	13.0	9.3	8.1	11.2	8.6	5.5	17.6
	Rural	8.9	6.9	13.0	9.0	7.9	10.9	8.9	5.7	19.2
	Urban	9.3	7.1	12.7	11.3	10.1	12.7	7.5	4.7	13.4
Ra	**All**	5.9	3.5	12.7	7.3	4.2	15.6	3.4	2.2	7.0
	Rural	5.6	3.0	12.9	6.9	3.7	15.7	2.5	1.6	5.6
	Urban	7.4	5.6	11.9	10.0	8.0	15.1	5.7	4.0	9.9

In the following sub-sections A to I, the provincial unemployment rates have been grouped into the following categories:

- Much higher than the national average
- Higher than the national average
- Lower than the national average
- Much lower than the national average

A. Total Population

National average for the total population of Fiji **8.6 %**
Rates for the total population of the provinces:

Unemployment Rate (X in %)	Provinces
X ≥ 10.0 : Much higher than national average	Naitasiri (13.4), Serua (11.3), Namosi (11.1), Rewa (10.6), Tailevu (10.2) NB:These are all the provinces in the Central Div.
8.6 ≤ X < 10: Higher than national average	Nadroga (9.0)
4.0 ≤ X < 8.6: Lower than national average.	Ba (8.5), Ra (5.9), Macuata (4.4)
< 4.0: Much lower than national average	Cakaudrove (3.4), Lomaiviti (2.8), Bua (1.6), Lau (0.7), Kadavu (0.6), Rotuma (0.2) NB: Apart from Cakaudrove and Bua, these are all the provinces in the Eastern Div.

The highest overall unemployment rates are found in the provinces of the Central Division. A very large proportion of the total urban population of Fiji resides in the urban areas of the Central Division, especially Naitasiri and Rewa.

By far the lowest unemployment rates are found in the four small island provinces of the Eastern Division and in Bua and Cakaudrove. Three of these provinces (Lau, Kadavu and Rotuma) do not have an urban sector at all, whereas the other three have a relatively small urban sector.

B. Total Male Population

National average for the total population of Fiji **6.8 %**

Rates for the total male population of the provinces:

Unemployment Rate (X in %)	Provinces
X ≥ 9.0 : Much higher than national average	Naitasiri (11.5), Namosi (9.1)
6.8 ≤ X < 9.0: Higher than national average	Rewa (8.8), Serua (8.8), Tailevu (7.8), Nadroga/Navosa (7.0)
3.0 ≤ X < 6.8: Lower than national average.	Ba (6.3), Ra (3.5), Macuata (3.1)
< 3.0: Much lower than national average	Cakaudrove (2.6), Lomaiviti (1.8), Bua (1.5), Lau (0.5), Kadavu (0.7), Rotuma (0.2) NB: Apart from Cakaudrove and Bua, these are all the provinces in the Eastern Div.

As in the case of the total population, male unemployment rates are by far the highest in the provinces of the Central Division, particularly in Naitasiri and Namosi. Moreover, male unemployment rates are low in the provinces of the Northern Division and very low in the provinces of the Eastern Division. Overall male unemployment is very significantly lower than overall female unemployment.

C. Total Female Population

National average for the total population of Fiji **12.3 %**

Rates for the total female population of the provinces:

Unemployment Rate (X in %)	Provinces
X ≥ 16.0 : Much higher than national average	Serua (17.1), Naitasiri (16.8)
12.3 ≤ X < 16.0: Higher than national average	Namosi (15.7), Tailevu (15.0), Rewa (14.3), Ba (13.6), Nadroga/Navosa (13.0), Ra (12.7)
5.0 ≤ X < 12.3: Lower than national average.	Macuata (7.6), Cakaudrove (5.1),
< 5.0: Much lower than national average	Lomaiviti (4.4), Bua (1.6), Lau (1.0), Kadavu (0.3), Rotuma (0.2) NB: Apart from Bua, these are all the provinces in the Eastern Div.

The unemployment rates for the total female population are much higher than those for the total male population. Interprovincial comparisons for the female population are, however, more or less the same as in the case of the males. The provinces of the Central Division have by far the highest female unemployment rates followed by the provinces of the Western Division. Once again, female unemployment in the provinces of the Northern Division tends to be lower and those for females in the provinces of the Eastern Division very much lower than the national average for females.

D. Population Rural Sector

National average for the total rural population of Fiji **5.7 %**

Rates for the total rural population of the provinces:

Unemployment Rate (X in %)	Provinces
X ≥ 9.0 : Much higher than national average	Rewa (11.9), Namosi (11.1), Tailevu (10.1), Serua (10.0),
5.7 ≤ X < 9.0: Higher than national average	Nadroga (8.9), Ba (6.1), Ra (5.6)
3.0 ≤ X < 5.7: Lower than national average.	Naitasiri (5.2),Cakaudrove (3.1),Macuata (3.1)
< 3.0: Much lower than national average	Lomaiviti (2.1), Bua (1.5), Lau (0.7), Kadavu (0.6), Rotuma (0.2)

The unemployment picture for the rural population in the provinces is very similar to that for the total population of these provinces. The unemployment rates for the rural population of all provinces of the Central Division (with the exception of the relatively small rural population of Naitasiri) are once again much higher than the national average.

The rural population of all the provinces in the Eastern Division as well as that of (the almost entirely rural) province of Bua are characterized by very low unemployment rates. Most rural people in these provinces are engaged in the subsistence sector.

E. Population Urban Sector

National average for the total urban population of Fiji **11.5 %**

Rates for the total urban population of the provinces:

Unemployment Rate (X in %)	Provinces*
X ≥ 11.5 : Higher than national average	Naitasiri (15.0), Serua (13.1)
8.0 ≤ X < 11.5: Lower than or equal to national average.	Rewa (10.5), Ba (10.8), Tailevu (10.6), Nadroga (9.3)
< 8.0: Much lower than national average	Ra (7.4), Macuata (6.3), Lomaiviti (5.0), Cakaudrove (5.0), Bua (3.4)

* The following provinces do not have an urban sector and are therefore not included: Namosi, Kadavu, Lau and Rotuma.

The overall urban unemployment rate is about two times higher than the overall rural unemployment rate. The main reason for this is the very high unemployment rate in the urban sector of Naitasiri. Only this province and the relatively small urban sector of Serua have an unemployment rate that is much higher than the national average for the urban sector. Urban unemployment in Rewa, Ba, Tailevu and Nadroga, though lower than the national average of 11.5 percent is also high.

The relatively small urban sectors of Bua (Nabouwalu), Lomaiviti (Levuka) and Cakaudrove (Savusavu) have a much lower unemployment than the national average. Somewhat surprisingly, the urban sector of Macuata Province (Labasa and the small urban area of Seaqaqa) and the small urban sector of Ra (Rakiraki) also fall in the category of much lower urban unemployment that the national average for the urban sector.

F. Fijian component of the population

National average for the total Fijian component of the population of Fiji **9.9 %**

Rates for the total Fijian population of the provinces:

Unemployment Rate (X in %)	Provinces*
X ≥ 12.0 : Much higher than national average	Naitasiri (15.2), Rewa (13.5), Serua (13.0)
9.9 ≤ X < 12.0: Higher than national average	Ba (11.5), Tailevu (11.3), Namosi (11.3)
5.0 ≤ X < 9.9: Lower than national average.	Nadroga/Navosa (9.3), Ra (7.3), Macuata (5.4)
< 5.0: Much lower than national average	Cakaudrove (3.4), Lomaiviti (2.9), Bua (1.6), Lau (0.7), Kadavu (0.6)

* The Fijian population of Rotuma is too small to be included

The picture for the Fijian component of the population is more or less the same as that for the total population. The unemployment situation for Fijians is particularly serious in the Central Division, especially in the large urbanized provinces of Naitasiri and Rewa. Other provinces with a large urban sector (Rewa and Tailevu) also have much higher unemployment for Fijians than the national average. It appears that unemployment in Fiji is first of all a problem for Fijians residing in the urban sector.

The provinces of the Eastern Division (with the exception of Rotuma) have an almost entirely Fijian population. These provinces and two other predominantly Fijian provinces in the Northern Division (Bua and Cakaudrove) are mainly rural and have much lower unemployment than the national average for Fijians.

G. Rural Fijian component of the population

National average for the rural Fijian component of the population of Fiji **6.2 %**

Rates for the rural Fijian population of the provinces:

Unemployment Rate (X in %)	Provinces*
X ≥ 10.0 : Much higher than national average	Rewa (12.7), Serua (11.3), Namosi (11.3), Tailevu (10.6) NB: This is the entire rural Fijian population of the Central Division, except Naitasiri
6.2 ≤ X < 10.0: Higher than national average	Nadroga/Navosa (9.0), Ba (7.6), Ra (6.9) NB: This is the entire rural Fijian population of the Western Division.
4.0 ≤ X < 6.2: Lower than national average.	Naitasiri (5.1)
< 4.0: Much lower than national average	Macuata (3.9), Cakaudrove (3.2), Lomaiviti (2.1), Bua (1.5), Lau (0.7), Kadavu (0.6) NB: This is the entire rural Fijian population of the Northern and Eastern Division.

* The Fijian population of Rotuma is too small to be included

The entire rural Fijian population of the Central Division, except Naitasiri has much higher unemployment than the national average for rural Fijians. Furthermore the entire rural Fijian population of the Western Division has higher unemployment than the national average for rural Fijians. A very large proportion of rural Fijians in the Central and Western Divisions are not involved in any kind of economic activity, including subsistence activities.

On the other hand, the entire rural Fijian population of the Northern and Eastern Division has much lower unemployment that the national average for rural Fijians. The majority of the rural Fijians in these two divisions is engaged in subsistence activities and, according to the ICLS definition, they are therefore employed.

H. Urban Fijian component of the population

National average for the urban Fijian component of the population of Fiji **15.0 %**

Rates for the urban Fijian population of the provinces:

Unemployment Rate (X in %)	Provinces*
X ≥ 15.0 : Higher than national average	Naitasiri (18.6), Serua (17.4), Tailevu (15.2)
8.0 ≤ X < 15.0: Lower than national average.	Ba (14.6), Rewa (13.7), Nadroga (11.3), Ra (10.0), Macuata (8.4),
< 8.0: Much lower than national average	Cakaudrove (5.9), Lomaiviti (5.8), Bua (3.8)

* The following provinces do not have an urban sector and are therefore not included: Namosi, Kadavu, Lau and Rotuma.

The overall level of unemployment for urban Fijians is very high, and also much higher than for urban Indians. Unemployment is particularly high in the large urban areas of the Central Division and in Ba. Fijian unemployment in the urban areas of the Northern and Central Division is much lower than the national average for urban Fijians.

I. Indian component of the population

National average for the Indian population of the population of Fiji **7.0 %**

Rates for the Indian component of the provinces:

Unemployment Rate (X in %)	Provinces*
X ≥ 7.0 : Much higher than national average	Naitasiri (10.8), Serua (8.9), Nadroga (8.6), Tailevu (7.9), Namosi (7.5)
4.0 ≤ X < 7.0: Higher than or equal to national average.	Ba (6.5), Rewa (6.2),
< 7.0: Lower than national average	Ra (3.4), Macuata (3.7), Cakaudrove (2.5), Lomaiviti (2.6), Bua (1.5)

* The Indian population of Kadavu, Lau and Rotuma is too small to be included

The overall unemployment rate for Indians is significantly lower than that of Fijians. Both ethnic groups have, however, in common that unemployment in the Central and Western Division tends to be much higher than in the Northern and Eastern Division. Moreover, the range in the provincial rates for Indians is significantly smaller than for Fijians. It will be noted that the large Indian population of Macuata Province has much lower unemployment than the national average for Indians. It is likely that one reason for this is that many Indians in this province who became unemployed have left the province.

J. Rural Indian component of the population

National average for the rural Indian component of the population of Fiji **5.0 %**

Rates for the rural Indian population of the provinces

Unemployment Rate (X in %)	Provinces*
X ≥ 7.0: Much higher than national average	Nadroga (8.9), Namosi (7.5), Tailevu (7.2),
5.0 ≤ X < 7.0: Higher than national average.	Serua (6.6), Naitasiri (5.9), Ba (5.2),
< 5.0: Lower than national average	Rewa (4.4), Ra (2.5), Macuata (2.5), Cakaudrove (1.6), Bua (1.5)

* The rural Indian population of Kadavu, Lomaiviti, Lau and Rotuma is too small to be included

The national average unemployment rate for rural Indians is lower than that of any of the other subgroups of the population discussed in this section. Moreover, by Fiji standards, the range in the unemployment rates of rural Indians is relatively small.

K. Urban Indian component of the population

National average for the urban Indian component of the population of Fiji **8.4 %**

Rates for the urban Indian population of the provinces

Unemployment Rate (X in %)	Provinces*
X ≥ 8.4: Higher than national average	Naitasiri (11.1), Serua (10.8),
6.0 ≤ X < 8.4: Lower than national average.	Tailevu (8.2), Ba (8.0), Nadroga (7.5), Rewa (6.3)
< 6.0: Much lower than national average	Ra (5.7), Macuata (5.4),Cakaudrove (4.0), Lomaiviti (3.4)

* The following provinces do not have an urban sector and are therefore not included: Namosi, Kadavu, Lau and Rotuma. Moreover, the urban Indian population of Bua Province (Nabouwalu) is too small to be included

The unemployment rate of urban Indians (8.4 %) is very significantly lower than that that of urban Fijians (15.0 %). It is possible that a significant number of Indians from out-migration provinces like Macuata who became unemployed during the 1996-2007 intercensal period ended up in the urban sector of Naitasiri (the Nasinu urban area) and possibly also in some of the urban areas of Ba Province (especially Lautoka and Nadi).

8. Further analysis of the employed in 2007

Questions D19a of the 2007 Census Interview Schedule separates the category "employed" from the unemployed and the economically inactive. In this question, all eligible respondents for the labour force questions (those aged 10 years and over) were asked to report whether they did, during the reference period, any work for money, payment in kind or subsistence. They were given the following options:

(1) Work for money

(2) Work to support household by producing goods for sale

(3) Work to support household by producing goods for household consumption

It needs to be reiterated that the so-called "inactive employed" were included in the category employed.[7]

Respondents were asked, if applicable, to select more than one option. Consequently, in 2007, the employed can be subdivided into seven categories. The three main categories are:

A. Purely wage/salary earners	(1)
B. Purely self-employed	(2)
C. Purely subsistence workers	(3)

These persons are engaged in only one category of employment (single employment). However, the 2007 Census also identifies the following combinations of the above employment categories:

D. Wage/salary earners as well as self-employed	(1) + (2)
E. Wage/salary earners as well as subsistence	(1) + (3)
F. Self-employed as well as subsistence	(2) + (3)
G. Wage/salary earners and self-employed as well as subsistence	(1) + (2) + (3)

Respondents labeled D – G, are persons involved in more than one category of employment.

In Tables IV-6a and b the employed population age 10 and over by sex, ethnicity and geographic sector in 2007 are categorized according to the above classification. Unfortunately, the same classification cannot be applied to 1996 Census labor force data. It will be noted that, since Table IV-5a and b refer to 2007 Census data only, the information refers to the population age 10 and over.

[7] The "inactive employed" include those who were during the reference period (last week) were temporarily absent from work because they were on leave, sick, on strike, involved in a labour dispute etc. In Fiji, this category typically constitutes at least 10 percent of all the employed.

Table IV-6a: The employed population age 10 and over by sex, ethnicity and employment category (Number and %) in 2007

Employment Category	Persons		Males		Females	
	Number	%	Number	%	Number	%
Total Population						
Total: All Employed	303,699	100.0	205,284	100.0	98,415	100.0
1	179,031	59.0	124,797	60.8	54,234	55.1
2	9,914	3.3	7,530	3.7	2,384	2.4
3	62,680	20.6	30,590	14.9	32,090	32.6
Total: Single category	251,625	82.9	162,917	79.4	88,708	90.1
1+2	3,646	1.2	2,893	1.4	753	0.8
1+3	19,316	6.4	16,077	7.8	3,239	3.3
2+3	26,602	8.8	21,585	10.5	5,017	5.1
1+2+3	2,510	0.8	1,812	0.9	698	0.7
Total: Multiple categories	52,074	17.1	42,367	20.6	9,707	9.8
Fijians						
Total: All Employed	164,821	100.0	105,799	100.0	59,022	100.0
1	77,697	47.1	49,754	47.0	27,943	47.3
2	6,284	3.8	4,624	4.4	1,660	2.8
3	46,022	27.9	23,285	22.0	22,737	38.5
Total: Single category	130,003	78.9	77,663	73.4	52,340	88.7
1+2	1,602	1.0	1,168	1.1	434	0.7
1+3	10,512	6.4	8,526	8.1	1,986	3.4
2+3	21,313	12.9	17,446	16.5	3,867	6.6
1+2+3	1,391	0.8	996	0.9	395	0.7
Total: Multiple categories	34,818	21.1	28,136	26.6	6,682	11.3
Indians						
Total: All Employed	121,466	100.0	88,470	100.0	32,996	100.0
1	89,528	73.7	67,635	76.5	21,893	66.4
2	3,225	2.7	2,645	3.0	580	1.8
3	13,242	10.9	5,372	6.1	7,870	23.9
Total: Single category	105,995	87.3	75,652	85.5	30,343	92.0
1+2	1,865	1.5	1,609	1.8	256	0.8
1+3	8,148	6.7	7,038	8.0	1,110	3.4
2+3	4,473	3.7	3,441	3.9	1,032	3.1
1+2+3	985	0.8	730	0.8	255	0.8
Total: Multiple categories	15,471	12.7	12,818	14.5	2,653	8.0

Note * Category 1 Wage/salary earners
Category 2 Self-employed (business)
Category 3 Subsistence workers

Table IV-6b: The employed population age 10 and over by sex, geographic sector and employment category (Number and %) in 2007

Employment Category	Persons		Males		Females	
	Number	%	Number	%	Number	%
All Sectors						
Total: All Employed	303,699	100.0	205,284	100.0	98,415	100.0
1	179,031	59.0	124,797	60.8	54,234	55.1
2	9,914	3.3	7,530	3.7	2,384	2.4
3	62,680	20.6	30,590	14.9	32,090	32.6
Total: Single category	251,625	82.9	162,917	79.4	88,708	90.1
1+2	3,646	1.2	2,893	1.4	753	0.8
1+3	19,316	6.4	16,077	7.8	3,239	3.3
2+3	26,602	8.8	21,585	10.5	5,017	5.1
1+2+3	2,510	0.8	1,812	0.9	698	0.7
Total: Multiple categories	52,074	17.1	42,367	20.6	9,707	9.8
Rural Sector						
Total: All Employed	134,211	100.0	92,567	100.0	41,644	100.0
1	53,804	40.1	40,565	43.8	13,239	31.8
2	6,230	4.6	4,960	5.4	1,270	3.1
3	41,349	30.8	19,746	21.3	21,603	51.9
Total: Single category	101,383	75.5	65,271	70.5	36,112	86.7
1+2	1,477	1.1	1,282	1.4	195	0.5
1+3	10,152	7.6	8,707	9.4	1,445	3.5
2+3	19,953	14.9	16,316	17.6	3,637	8.7
1+2+3	1,246	0.9	991	1.1	255	0.6
Total: Multiple categories	32,828	24.5	27,296	29.5	5,532	13.3
Urban Sector						
Total: All Employed	169,488	100.0	112,717	100.0	56,771	100.0
1	125,227	73.9	84,232	74.7	40,995	72.2
2	3,684	2.2	2,570	2.3	1,114	2.0
3	21,331	12.6	10,844	9.6	10,487	18.5
Total: Single category	150,242	88.6	97,646	86.6	52,596	92.6
1+2	2,169	1.3	1,611	1.4	558	1.0
1+3	9,164	5.4	7,370	6.5	1,794	3.2
2+3	6,649	3.9	5,269	4.7	1,380	2.4
1+2+3	1,264	0.7	821	0.7	443	0.8
Total: Multiple categories	19,246	11.4	15,071	13.4	4,175	7.4

Note * Category 1 Wage/salary earners
Category 2 Self-employed (business)
Category 3 Subsistence workers

The following comments refer to the information in Table IV-6a and b:

- More than 80 percent of all employed are engaged in one category of work only (1, 2 or 3). As expected, this percentage is significantly higher for the urban sector (89 percent) than for the rural sector (76 percent). In the case of females more than 90 percent of all employed are engaged in a single category.

- By far the largest sub-category of employed (59 percent) is pure wage/salary earners without any other activities. However for the Fijians, this category is only 47 percent and for Indians 74 percent. Once again, as expected the figures are very different for the urban and rural sector (74 percent and 40 percent respectively).

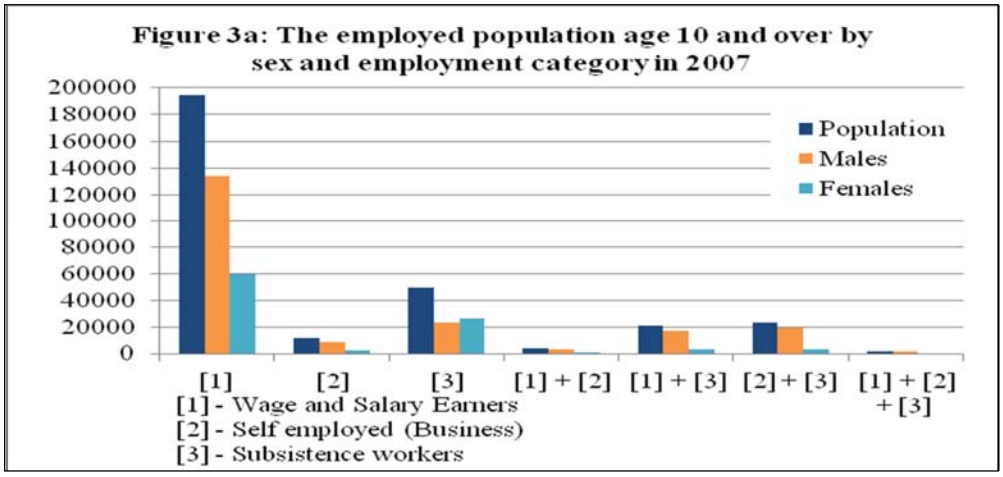
- The sub-category of pure subsistence workers (only 3) amounts to 21 percent of all employed. For Fijians this category is still 28 percent of all employed whereas for Indians it is only 11percent? Even in the urban sector, about 13 percent of all employed are pure subsistence workers. They are undoubtedly mainly found in the cities/towns with a large peri-urban area. This should be taken into account during the next urban area delineation.

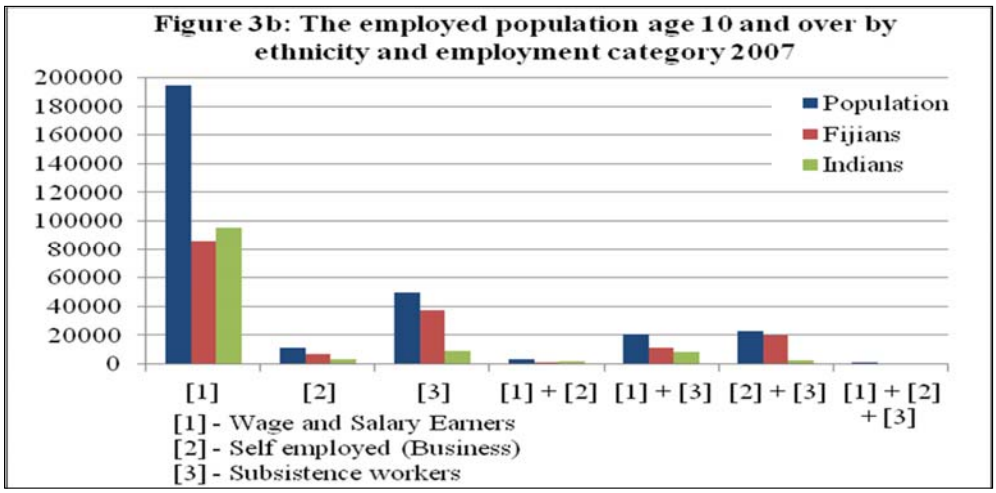
- As expected, a fairly large proportion of Fijian as well as Indian employed (about 6 percent) are wage/salary earners who are also engaged in subsistence activities. This percentage is higher for males (8 percent) than for females (3 percent)

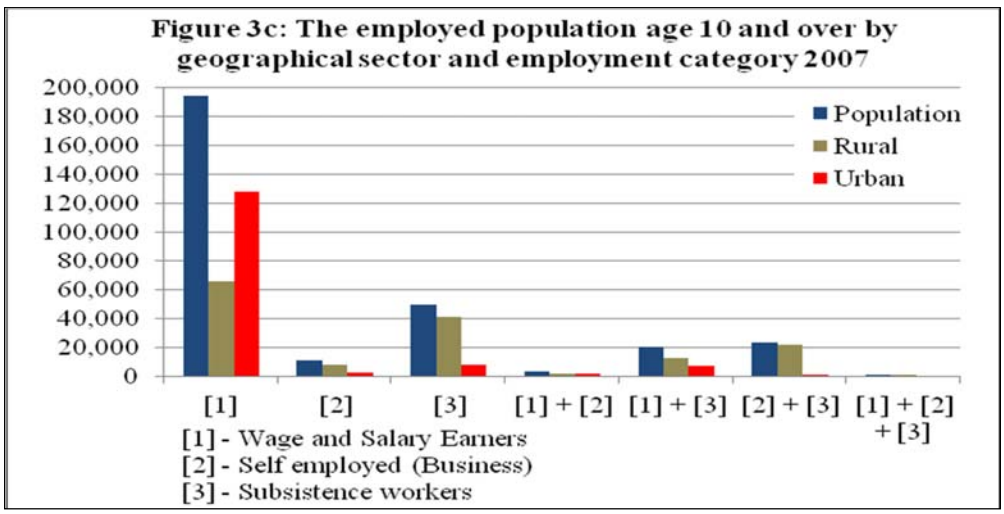
- Only a small proportion of all employed Fijians as well as Indians (less than 1 percent) is engaged in all three main activities (1, 2 and 3).

An overview of the different categories of employed age 10 and over by sex, ethnicity and geographic sector is presented in Figure IV-3

Figure IV-3: Overview of the different categories of employed age 10 and over by sex, ethnicity and geographic sector in 2007.







9. Further analysis of the unemployed in 1996 and 2007

Section 9 has a closer look at the unemployed. As mentioned, there are several ways to measure unemployment. Firstly the unemployment rates presented in Table IV-4 are "pure" unemployment rates according to the ICLS definition. In other words, during the reference period, these persons:

(1) Did not work

(2) Were available for work

(3) Were actively looking for work.

However, these persons are not the only ones who were, during the reference period, actively looking for paid employment.

- Subsistence workers actively seeking paid employment

  Planners in Fiji are particularly interested to know to what extent those who have been categorized as subsistence workers during the census (those who were working for household consumption only), were actively attempting to get paid employment. In this respect, it should be mentioned that it is likely that a significant number of cane farmers who recently lost their land as well as other persons who lost their paid job after the coups in 2000 and 2006 were probably categorized as subsistence workers during the 2007 Census. Many of them are probably trying to get back into paid employment. This is further explored in Section 9.1.

- Unemployment according to the ILO availability criterium

  Unemployment in 2007 can also be measured according to the ILO "availability" criterion. These are the unemployed who, during the reference period, did not work and were available for work. In this ILO definition, the third requirement, actively looking for work has been dropped. Section 9.2 briefly comments on unemployment according to the ILO criterium.

9.1. Subsistence workers actively seeking paid employment

The following two Tables IV-7a and b present the number of subsistence workers age 15 and over who, in 2007, reported that they were actively looking for work. Table IV-7a presents this information by sex and ethnicity and Table IV-7b presents the same information by sex and geographic sector.

The information in these two tables does not present any major surprise. It confirms that a large number of Fijians and a relatively small number of Indians, engaged in subsistence activities, are seeking paid employment. However, there are two times more male subsistence workers than female subsistence workers, seeking paid employment. Furthermore, as expected, the majority of the male and female subsistence workers, seeking paid employment are rural dwellers.

Table IV-7a: The subcategories of the "unemployed" age 15 and over by sex and ethnicity in 2007

Ethnic Group	Sex	Econ. Active Pop.	Actively looking for paid employment					
			Total		Subsistence Workers		Pure (ICLS) Unemployed	
			Number	Rate	Number	Rate	Number	Rate
All	**P**	326,496	38,469	11.8	10,249	3.1	28,220	8.6
	M	217,168	21,596	9.9	6,829	3.1	14,767	6.8
	F	109,328	16,873	15.4	3,420	3.1	13,453	12.3
Fijians	**P**	178,884	26,244	14.7	8,465	4.7	17,779	9.9
	M	113,541	15,214	13.4	5,669	5.0	9,545	8.4
	F	65,343	11,030	16.9	2,796	4.3	8,234	12.6
Indians	**P**	129,045	10,463	8.1	1,486	1.2	8,977	7.0
	M	92,028	5,402	5.9	945	1.1	4,457	4.8
	F	37,017	5,061	13.7	541	1.5	4,520	12.2

Table IV-7b: The subcategories of the "unemployed" age 15 and over by sex and geographic sector in 2007

Ethnic Group	Sex	Econ. Active Pop.	Actively looking for paid employment					
			Total		Subsistence Workers		Pure (ICLS) Unemployed	
			Number	Rate	Number	Rate	Number	Rate
All Sectors	**P**	326,496	38,469	11.8	10,249	3.1	28,220	8.6
	M	217,168	21,596	9.9	6,829	3.1	14,767	6.8
	F	109,328	16,873	15.4	3,420	3.1	13,453	12.3
Rural Sector	**P**	162,323	17,396	10.7	8,078	5.0	9,318	5.7
	M	111,882	10,187	9.1	5,318	4.8	4,869	4.4
	F	50,441	7,209	14.3	2,760	5.5	4,449	8.8
Urban Sector	**P**	164,173	21,073	12.8	2,171	1.3	18,902	11.5
	M	105,286	11,409	10.8	1,511	1.4	9,898	9.4
	F	58,887	9,664	16.4	660	1.1	9,004	15.3

Table IV-8a and b present the information at the provincial level.

Table IV-8a: Provincial comparison of the unemployment rates of the subcategories of the "unemployed" age 15 and over by sex and ethnicity in 2007

Province	Sex	Actively looking for paid employment								
		Total			Subsistence Workers			Pure (ICLS) Unemployed		
		All	Fij.	Ind.	All	Fij.	Ind.	All	Fij.	Ind.
Fiji	**Persons**	**11.8**	**14.7**	**8.1**	**3.1**	**4.7**	**1.2**	**8.6**	**9.9**	**7.0**
	Males	**9.9**	**13.4**	**5.9**	**3.1**	**5.0**	**1.1**	**6.8**	**8.4**	**4.8**
	Females	**15.4**	**16.9**	**13.7**	**3.1**	**4.3**	**1.5**	**12.3**	**12.6**	**12.2**
Provinces of the Central Division										
Naitasiri	**Persons**	15.3	18.2	11.3	1.9	3.0	0.5	13.4	15.2	10.8
	Males	13.7	17.8	8.7	2.2	3.7	0.5	11.5	14.1	8.3
	Females	18.1	18.9	16.8	1.3	1.7	0.6	16.8	17.1	16.2
Namosi	**Persons**	24.8	26.3	9.8	13.7	14.9	2.5	11.1	11.4	7.3
	Males	24.1	25.9	7.8	15.0	16.6	1.9	9.1	9.3	5.9
	Females	26.2	27.1	17.5	11.0	11.5	5.0	15.2	15.6	12.5
Rewa	**Persons**	12.2	15.9	6.7	1.6	2.4	0.5	10.6	13.5	6.2
	Males	10.7	14.6	4.9	1.8	2.8	0.4	8.8	11.8	4.5
	Females	14.4	17.6	9.9	1.2	1.7	0.6	13.3	16.0	9.3
Serua	**Persons**	13.9	16.9	9.7	2.6	3.9	0.8	11.3	13.0	8.9
	Males	11.9	14.8	7.6	3.1	4.6	1.0	8.8	10.2	6.6
	Females	18.6	21.0	15.9	1.6	2.4	0.0	17.1	18.6	15.9
Tailevu	**Persons**	16.4	19.4	10.1	6.2	8.1	2.2	10.2	11.3	7.9
	Males	13.8	17.5	6.7	6.0	8.4	1.5	7.8	9.1	5.3
	Females	21.5	22.8	18.8	6.5	7.5	3.9	15.0	15.3	14.9
Provinces of the Northern Division										
Bua	**Persons**	7.0	6.7	9.2	5.4	5.1	7.7	1.6	1.6	1.5
	Males	7.2	6.4	12.7	5.7	4.8	11.1	1.5	1.5	1.6
	Females	6.5	7.2	4.7	4.9	5.5	3.5	1.6	1.7	1.3
Cakaudrove	**Persons**	7.5	8.2	3.9	4.1	4.8	1.4	3.4	3.4	2.5
	Males	6.8	7.7	2.5	4.2	4.8	1.4	2.6	2.9	1.2
	Females	9.2	9.2	7.1	4.0	4.6	1.6	5.1	4.6	5.5
Macuata	**Persons**	6.5	8.6	5.3	2.2	3.2	1.6	4.4	5.4	3.7
	Males	4.9	7.2	3.6	1.9	3.3	1.0	3.1	4.0	2.5
	Females	10.5	11.8	9.8	2.9	3.0	3.0	7.6	8.8	6.8

Provinces of the Western Division										
Ba	**Persons**	10.0	13.4	7.6	1.4	2.0	1.1	8.5	11.5	6.5
	Males	7.8	11.7	5.4	1.5	2.2	1.1	6.3	9.5	4.4
	Females	14.9	16.6	13.7	1.3	1.5	1.2	13.6	15.1	12.5
Nadroga	**Persons**	17.8	22.6	10.4	8.8	13.3	1.8	9.0	9.3	8.6
	Males	15.0	21.1	7.1	8.0	13.0	1.6	7.0	8.1	5.5
	Females	23.3	24.9	19.9	10.3	13.8	2.3	13.0	11.2	17.6
Ra	**Persons**	10.0	13.1	4.3	4.0	5.8	0.8	5.9	7.3	3.4
	Males	6.8	9.0	2.7	3.3	4.9	0.5	3.5	4.2	2.2
	Females	18.9	24.0	8.8	6.2	8.4	1.8	12.7	15.6	7.0
Provinces of the Eastern Division										
Kadavu	**Persons**	8.5	8.5	14.7	7.9	7.9	14.7	0.6	0.6	0.0
	Males	9.9	9.8	19.2	9.2	9.1	19.2	0.7	0.7	0.0
	Females	6.3	6.4	0.0	6.0	6.1	0.0	0.3	0.4	0.0
Lau	**Persons**	2.4	2.4	0.0	1.7	1.7	0.0	0.7	0.7	0.0
	Males	2.1	2.1	0.0	1.6	1.6	0.0	0.5	0.5	0.0
	Females	2.7	2.7	0.0	1.8	1.7	0.0	1.0	1.0	0.0
Lomaiviti	**Persons**	10.3	10.5	7.0	7.5	7.6	4.4	2.8	2.9	2.6
	Males	8.9	9.3	2.8	7.1	7.3	2.8	1.8	1.9	0.0
	Females	12.4	12.4	15.1	8.0	8.1	7.5	4.4	4.3	7.5
Rotuma	**Persons**	2.8	4.4	0.0	2.7	4.4	0.0	0.1	0.0	0.0
	Males	3.5	5.3	0.0	3.3	5.3	0.0	0.2	0.0	0.0
	Females	1.9	3.8	0.0	1.9	3.8	0.0	0.0	0.0	0.0

Table IV-8b: Provincial comparison of the unemployment rates of the subcategories of the "unemployed" age 15 and over by sex and geographic sector in 2007

Province	Sex	Actively looking for paid employment								
		Total			Subsistence Workers			Pure (ICLS) Unemployed		
		All	Rur.	Urb.	All	Rur.	Urb.	All	Rur.	Urb.
Fiji	**Persons**	**11.8**	**10.7**	**12.8**	**3.1**	**5.0**	**1.3**	**8.6**	**5.7**	**11.5**
	Males	**9.9**	**9.1**	**10.8**	**3.1**	**4.8**	**1.4**	**6.8**	**4.4**	**9.4**
	Females	**15.4**	**14.3**	**16.4**	**3.1**	**5.5**	**1.1**	**12.3**	**8.8**	**15.3**
Provinces of the Central Division										
Naitasiri	**Persons**	15.3	11.5	16.0	1.9	6.3	1.0	13.4	5.3	15.0
	Males	13.7	11.7	14.2	2.2	7.2	1.8	11.5	4.4	13.0
	Females	18.1	11.3	19.4	1.3	4.4	0.6	16.8	6.9	18.7
Namosi	**Persons**	24.8	24.8	-	13.7	13.7	-	11.1	11.1	-
	Males	24.1	24.1	-	15.0	15.0	-	9.1	9.1	-
	Females	26.2	26.2	-	11.0	11.0	-	15.2	15.2	-
Rewa	**Persons**	12.2	18.0	11.5	1.6	6.1	1.0	10.6	11.9	10.5
	Males	10.7	17.8	9.8	1.8	6.4	1.3	8.8	11.3	8.5
	Females	14.4	18.4	14.0	1.2	5.6	0.7	13.3	12.8	13.3
Serua	**Persons**	13.9	14.1	13.7	2.6	4.0	0.6	11.3	10.0	13.1
	Males	11.9	12.6	10.8	3.1	4.7	0.6	8.8	7.9	10.2
	Females	18.6	17.9	19.6	1.6	2.4	0.5	17.1	15.5	19.1
Tailevu	**Persons**	16.4	18.3	12.6	6.2	8.3	2.0	10.2	10.0	10.6
	Males	13.8	15.8	10.1	6.0	8.1	2.0	7.8	7.7	7.9
	Females	21.5	22.9	18.3	6.5	8.5	1.9	15.0	14.4	16.4
Provinces of the Northern Division										
Bua	**Persons**	7.0	7.0	5.5	5.4	5.5	2.1	1.6	1.5	3.4
	Males	7.2	7.3	4.9	5.7	5.9	2.2	1.5	1.5	2.7
	Females	6.5	6.5	6.5	4.9	5.0	1.9	1.6	1.5	4.6
Cakaudrove	**Persons**	7.5	7.7	6.6	4.1	4.5	1.6	3.4	3.1	5.0
	Males	6.8	7.0	5.5	4.2	4.6	1.8	2.6	2.4	3.7
	Females	9.2	9.2	9.0	4.0	4.5	1.3	5.1	4.7	7.7
Macuata	**Persons**	6.5	9.0	5.0	2.2	2.6	1.9	4.4	6.3	3.1
	Males	4.9	6.7	3.9	1.9	2.1	1.7	3.1	4.6	2.2
	Females	10.5	13.3	8.1	2.9	3.5	2.4	7.6	9.8	5.7

Provinces of the Western Division										
Ba	**Persons**	10.0	8.0	11.8	1.4	1.9	1.0	8.5	6.1	10.8
	Males	7.8	6.1	9.6	1.5	1.8	1.2	6.3	4.3	8.4
	Females	14.9	13.3	16.0	1.3	2.3	0.7	13.6	11.1	15.4
Nadroga	**Persons**	17.8	18.9	12.0	8.8	10.0	2.8	9.0	8.9	9.3
	Males	15.0	15.9	9.9	8.0	8.9	2.8	7.0	6.9	7.1
	Females	23.3	25.1	15.5	10.3	12.1	2.7	13.0	13.0	12.7
Ra	**Persons**	10.0	10.4	8.1	4.0	4.8	0.7	5.9	5.6	7.4
	Males	6.8	6.9	6.3	3.3	3.8	0.6	3.5	3.0	5.6
	Females	18.9	20.4	12.7	6.2	7.5	0.8	12.7	12.9	11.9
Provinces of the Eastern Division										
Kadavu	**Persons**	8.5	8.5	-	7.9	7.9	-	0.6	0.6	-
	Males	9.9	9.9	-	9.2	9.2	-	0.7	0.7	-
	Females	6.3	6.3	-	6.0	6.0	-	0.3	0.3	-
Lau	**Persons**	2.4	2.4	-	1.7	1.7	-	0.7	0.7	-
	Males	2.1	2.1	-	1.6	1.6	-	0.5	0.5	-
	Females	2.7	2.7	-	1.8	1.8	-	1.0	1.0	-
Lomaiviti	**Persons**	10.3	7.9	17.2	7.5	5.8	12.2	2.8	2.1	5.0
	Males	8.9	6.9	15.1	7.1	5.6	11.8	1.8	1.4	3.3
	Females	12.4	9.4	20.2	8.0	6.2	12.8	4.4	3.2	7.4
Rotuma	**Persons**	2.8	2.8	-	2.7	2.7	-	0.1	0.1	-
	Males	3.5	3.5	-	3.3	3.3	-	0.2	0.2	-
	Females	1.9	1.9	-	1.9	1.9	-	0.0	0.0	-

9.2. Unemployment according to the ILO "availability" criterium

Previous censuses measured unemployment according to the ICLS criteria. During the 2007 Census, the main emphasis was again on measuring unemployment according to the same ICLS criteria that has been used before. However, in addition, the 2007 Census also attempted to measure unemployment according to the availability criterium of the ILO. During this census, eligible respondents were asked whether they were "available to start work" (Question D24c).

A comparison has been made between the two sets of unemployment data. As expected, the inclusion of those who were available but not actively looking for work into the category unemployed increases the already high unemployment rates for 2007 significantly.

The unemployment rates according to the ILO availability criterion should be considered with the utmost caution. It must again be stressed that the information on which these rates are based, has been collected in a census interview situation. In other words, the information has, in many if not most cases, been provided by a proxy-respondent, often the head of household or his/her spouse. This proxy-respondent answered the question on availability for all other household members. It is unlikely that this proxy respondent was in all cases able to provide an accurate answer to this question the more so since, according to the ILO definition, no evidence of looking for work is required. A simple statement of being available for work suffices.

The 2007 unemployment data according to the ILO definition is arguably of lower quality than the unemployment data according to the ICLS definition. Furthermore, comparison of the ILO rates in 2007 and 1996 is not possible since the 1996 Census did not attempt to measure unemployment according to the ILO “availability” criterium.

In order to prevent confusion amongst users, the 2007 unemployment rates according to the ILO criteria are not included in this report. They are available on request from the FBoS. The FBoS strongly recommends that all users stick to the unemployment data according to the ICLS definition. In particular, a comparison of 1996 unemployment rates according to the ICLS definition with 2007 unemployment rates according to the ILO definition should be avoided at all cost. Such a comparison is completely invalid.

V EDUCATION AND LITERACY

The government of Fiji considers Human Resource Development (HRD) as an area of top priority. One of its policy objectives is to achieve Universal Primary Education (UPE). According to Millennium Development Goal (MDG) 2, this objective should be achieved by 2015. In other words, by 2015 all children should complete a full course of primary schooling.

Chapter V consists of five sections 1 to 5.

- Section 1 discusses the data sources on education and highlights some of the shortcomings of this data.
- Section 2 compares education status of the population in 1996 and in 2007
- Section 3 focuses on the "at-school" population, or more precisely on their level of school attendance. Comparisons are made between 1996 and 2007.
- Section 4 concentrates on the "not-at school" population (those who left school). Their situation in 1996 and 2007 is once again compared.
- The final Section 5 presents a measure of adult literacy, which has been estimated indirectly from census data in 1996 and 2007.

1. Data Sources

The data requirements concerning education are not the same for the population at school and for those who have left school.

For the at school population, the minimum information required by planners refers to:

- Enrollment (or access to education)
- Retention (progress in education)
- Achievement (quality of education)

Equally important is the need for detailed information concerning the level of education and training achieved by those respondents who have completed school and are already engaged in the labour force or are available for employment. Their educational achievement or the qualifications they have obtained need to be cross classified with other characteristics like their age, sex and marital status, their usual place of residence, labour force status etc. The main users of this information are employment and manpower planners.

In most countries, there are three potential sources of data concerning the educational characteristics of the population. These are:

- Service (administrative) statistics of the DOE
- Censuses
- Surveys.

These three sources and their contribution to the education and literacy database in Fiji are briefly discussed in the following sub-sections.

1.1. Service statistics of the DOE

The DOE monitors the enrolment, retention and achievement of all those who enrolled at an institution controlled by the department. Like the Department of Health (DOH), the DOE has its own network (educational institutions) throughout the country. This network is used for the continuous collection of administrative statistics of the enrolled population. Some of this information is published in the Annual Reports of the department. In this section, the nature of this information, as well as some of its shortcomings, are briefly discussed. This leads to the identification of data gaps concerning education, and possible ways to fill these data gaps by using other data collection systems.

1.1.1. Enrollment

The DOE collects enrollment data from all its educational institutions on a regular basis. This raw data is processed, analyzed and converted into basic enrollment indices. The data is further enhanced by cross-classifying it with basic characteristics of the enrolled persons, especially their age and sex.

The most common indices of access to school (enrolment) used by the DOE are the Gross Enrolment Ratio (GER) and Net Enrollment Ratio (NER).

- The Gross Enrolment Ratio (GER) is defined as the number of students enrolled in a level of education, regardless of age, as a percentage of the population of official school age for that level. For reasons such as grade repetition, attendance at levels of schooling at an age that are not typical for that level (i.e. because of late enrollment) as well as other reasons, the GER can reach a value higher than 100 percent. For this and other reasons, the GER is not considered as an entirely satisfactory indicator of access to school (enrolment).

- The Net Enrollment Ratio (NER) is a more satisfactory indicator of access to school. This ratio is defined as the number of students at a particular level who are of the official age for that level, as a percentage of the population of the official school age for that level. For instance, in Fiji, the official school age for Class 1 to 6 students is age 6 to 11.

1.1.2. Retention

Enrolment ratios and other indices of access to school do not give a complete picture of the education situation of the enrolled population. Equally important is that, after being enrolled, children stay at school and complete their schooling. The extent to which this happens is measured by means of the Cohort Retention Ratio (CRR). The only data collection system that can provide complete, accurate and up to date CRRs is the system of service statistics of the DOE.

1.1.3. Achievement

Apart from access to school and retention at school, the level of educational achievement of the population at school needs to be measured. This can be done in various ways, the most common being test marks, exam results etc. Once again, the only data collection system that can measure achievement in this manner is the DOE. However, there are other ways to measure achievement. One example is measurement of the level of literacy. Literacy indices are usually estimated for the entire population. In order to do this, one obviously has to rely on other data collection systems than the service statistics of the DOE, since this department only collects information for the population enrolled in its educational institutions.

In conclusion, the main shortcoming of the service statistics of the DOE is that this system only collects information for the population at school and not for those who have left school or have never been to school.

1.2.Surveys

Surveys based on a representative sample of the population can provide detailed information about the level of education and literacy in a country. The most common survey is probably the literacy survey. In this kind of survey, randomly selected respondents are tested about their literacy skills viz.

- Reading
- Writing
- Understanding

Unfortunately, a nationwide literacy survey, based on a representative sample of the population has never been carried out in Fiji.

1.3.Censuses

Virtually all censuses include one or more questions regarding school attendance and educational attainment. In addition, questions concerning further training are often included as well. Since 1946, all censuses in Fiji have included one or more questions of this kind.

The 2007 Census Interview Schedule included questions about:

- Current attendance at a formal educational institution (Question D15)
- Educational attainment (Question D16a and b)
- Main field of study (Question D17)

1.3.1. School attendance:

Question D14 on the 2007 Census Interview Schedule asks:

"Is this person currently attending any formal educational institution?"

Four pre-coded answers are given viz.:

- Full time attendance
- Part time attendance
- Left school
- Never been

Full time students are defined as those who are enrolled in an educational programme whose study load is considered full time according to Fiji standards. Part time students are those whose study load is less than that of a full time student. Consequently, part time students require a longer period to complete an equivalent educational programme.

During the training of field staff for the 2007 Census as well as during the subsequent field operation of this census, it was stressed that students who usually attend school but did not attend at the time of the census interview due to illness or for some other reason should be considered as full time students.

1.3.2. Educational attainment

After establishing the school attendance status of all respondents, full and part-time students were asked about the level of education they are attending:

"What is the level of education this person is attending?"

Furthermore, those who had left school were asked to report the highest level of education they had completed:

"What is the highest level of education this person has completed?"

1.3.3. Field of study

All persons who had completed a study at the tertiary or vocational level were asked:

"What is the main field of study this person has completed?"

Next, these persons were asked:

"What is the name and location of the institution where this study was completed?"

Enumerators were instructed only to enter degrees, diplomas and certificates from officially recognized institutions.

2. Educational status

Table V-1a to c present an overview of the educational status of the total population by sex, ethnicity and geographic sector. The situation in 2007 is compared to that in 1996. In 2007, the "at school" population was subdivided into full-time and part-time students. All part-time students pursued studies at the tertiary or vocational level. In order to preserve comparability with the 1996 data these part-time students have not been included in Table V-1a to c.

Table V-1a: Educational status of the population by sex in 1996 and 2007

Category	Total		Males		Females	
	Nr	%	Nr	%	Nr	%
1996						
Total Population	**775,077**	**100.0**	**393,931**	**100.0**	**381,146**	**100.0**
➢ **Attending school**	221,174	28.5	112,747	28.6	108,427	28.5
➢ **Not attending school**	553,903	71.5	281,184	71.4	272,719	71.5
• **Left school**	440,512	56.8	226,309	57.5	214,203	56.2
• **Never attended**	113,391	14.6	54,875	13.9	58,516	15.4
2007						
Total Population	**837,271**	**100.0**	**427,160**	**100.0**	**410,111**	**100.0**
➢ **Attending school**	231,050	27.6	118,999	27.9	112,051	27.3
➢ **Not attending school**	606,221	72.4	308,161	72.1	298,060	72.7
• **Left school**	517,400	61.8	262,173	61.4	255,277	62.2
• **Never attended**	88,821	10.6	45,988	10.8	42,833	10.4

Table V-1b: Educational status of the population by ethnicity in 1996 and 2007

Category	Total		Fijians		Indians	
	Nr	%	Nr	%	Nr	%
1996						
Total Population	**775,077**	**100.0**	**393,575**	**100.0**	**338,818**	**100.0**
➢ **Attending school**	221,174	28.5	113,247	28.8	95,008	28.0
➢ **Not attending school**	553,903	71.5	280,328	71.2	243,810	72.0
• **Left school**	440,512	56.8	221,877	56.4	194,496	57.4
• **Never attended**	113,391	14.6	58,451	14.9	49,314	14.5
2007						
Total Population	**837,271**	**100.0**	**475,739**	**100.0**	**313,801**	**100.0**
➢ **Attending school**	231,050	27.6	139,703	29.4	76,351	24.3
➢ **Not attending school**	606,221	72.4	336,036	70.6	237,450	75.7
• **Left school**	517,400	61.8	276,043	58.0	213,668	68.1
• **Never attended**	88,821	10.6	59,993	12.6	23,782	7.6

Table V-1c: Educational status of the population by geographic sector in 1996 and 2007

Category	Total		Rural		Urban	
	Nr	%	Nr	%	Nr	%
1996						
Total Population	775,077	100.0	415,582	100.0	359,495	100.0
➢ **Attending school**	221,174	28.5	116,788	28.1	104,386	29.0
➢ **Not attending school**	553,903	71.5	298,794	71.9	255,109	71.0
• **Left school**	440,512	56.8	233,069	56.1	207,443	57.7
• **Never attended**	113,391	14.6	65,725	15.8	47,666	13.3
2007						
Total Population	837,271	100.0	412,410	100.0	424,861	100.0
➢ **Attending school**	231,050	27.6	111,291	27.0	119,759	28.2
➢ **Not attending school**	606,221	72.4	301,119	73.0	305,102	71.8
• **Left school**	517,400	61.8	254,072	61.6	263,328	62.0
• **Never attended**	88,821	10.6	47,047	11.4	41,774	9.8

It appears that during the intercensal period 1996-2007:

- The gender distribution of the “at school” and “not at school” population has changed only very marginally. About the same proportions of males and females attend school.

- The proportion of rural as well as urban children attending school has slightly dropped. Urban school attendance remains very marginally higher than rural school attendance.

- Change in school attendance mainly affected the Indian population. The decrease in the proportions attending school and the corresponding increase in the proportions that left school is, however mainly due to the continuing fertility transition of the Indians and probably also to age-differential out-migration.

Table V-2a presents a comparison of school attendance at the provincial level by sex and ethnicity. Furthermore, Table V-2b presents the same information for the rural and urban sector but only at the national level.

Table V-2a: Provincial comparison of educational status (%) by sex and ethnicity in 2007

Province	Sex	Attendance status (%)								
		Attending			Not attending					
					Left school			Never attended		
		All	Fij.	Ind.	All	Fij.	Ind.	All	Fij.	Ind.
Fiji	**Persons**	27.6	29.4	24.3	61.8	58.0	68.1	10.6	12.6	7.6
	Males	27.9	29.8	24.4	61.4	57.4	68.0	10.8	12.9	7.6
	Females	27.3	28.9	24.3	62.2	58.7	68.2	10.4	12.4	7.5
Provinces of the Central Division										
Naitasiri	**Persons**	28.7	31.3	24.4	60.5	56.4	67.5	10.7	12.3	8.1
	Males	29.1	31.8	24.8	59.9	55.5	67.0	11.0	12.7	8.2
	Females	28.4	30.8	24.1	61.2	57.3	68.0	10.4	11.9	7.9
Namosi	**Persons**	28.1	28.7	23.4	58.6	57.9	63.8	13.3	13.4	12.8
	Males	28.1	28.7	24.5	58.5	57.7	63.4	13.4	13.6	12.1
	Females	28.0	28.7	22.0	58.7	58.2	64.3	13.3	13.1	13.7
Rewa	**Persons**	29.5	30.0	25.0	60.4	58.5	68.7	10.0	11.6	6.3
	Males	29.8	30.1	24.9	59.8	57.9	68.4	10.4	12.0	6.7
	Females	29.3	29.6	25.0	61.0	59.2	69.0	9.7	11.2	6.0
Serua	**Persons**	26.9	28.8	23.6	61.6	57.7	68.3	11.5	13.5	8.1
	Males	26.8	28.7	24.0	61.7	57.5	68.2	11.5	13.8	7.8
	Females	27.0	29.0	23.3	61.6	57.9	68.4	11.4	13.1	8.3
Tailevu	**Persons**	30.0	31.6	24.5	59.0	56.1	67.9	11.0	12.3	7.5
	Males	31.9	34.2	24.2	56.8	53.1	68.4	11.3	12.7	7.4
	Females	27.9	28.7	24.8	61.4	59.4	67.5	10.7	11.8	7.7
Provinces of the Northern Division										
Bua	**Persons**	25.7	25.5	26.7	60.7	60.4	62.5	13.6	14.1	10.7
	Males	26.0	25.7	27.6	60.3	60.1	61.4	13.7	14.2	10.9
	Females	25.4	25.3	25.8	61.1	60.8	63.7	13.5	13.9	10.5
Cakaudrove	**Persons**	29.2	29.5	26.7	57.8	56.6	63.9	12.9	13.9	9.3
	Males	29.2	29.5	27.1	57.7	56.4	63.6	13.2	14.1	9.3
	Females	29.3	29.5	26.4	58.0	56.8	64.3	12.7	13.7	9.3
Macuata	**Persons**	28.1	29.9	26.8	61.9	56.7	65.6	10.0	13.4	7.6
	Males	28.0	29.5	26.9	61.8	56.9	65.3	10.2	13.7	7.8
	Females	28.1	30.4	26.6	62.1	56.5	65.8	9.8	13.1	7.5

Provinces of the Western Division										
Ba	**Persons**	25.5	28.0	23.4	64.9	59.5	69.2	9.6	12.5	7.4
	Males	25.7	28.3	23.5	64.6	58.8	69.1	9.7	12.9	7.4
	Females	25.3	27.6	23.3	65.2	60.2	69.3	9.5	12.2	7.4
Nadroga	**Persons**	24.4	25.1	23.3	65.1	62.4	69.1	10.6	12.5	7.6
	Males	23.9	24.8	22.6	65.7	62.9	69.9	10.4	12.3	7.5
	Females	24.9	25.4	24.2	64.4	62.0	68.2	10.7	12.7	7.6
Ra	**Persons**	27.1	28.6	23.6	61.4	58.1	69.1	11.5	13.3	7.3
	Males	27.3	29.0	23.3	61.1	57.6	69.3	11.6	13.5	7.4
	Females	26.9	28.1	23.9	61.8	58.7	68.9	11.4	13.2	7.2
Province of the Eastern Division										
Kadavu	**Persons**	28.4	28.7	10.2	58.3	58.1	83.7	13.3	13.2	6.1
	Males	27.7	28.0	14.8	59.8	59.4	80.0	12.5	12.6	5.7
	Females	29.2	29.3	0.0	56.7	56.7	92.8	14.1	14.0	7.1
Lau	**Persons**	29.3	29.5	13.6	58.5	58.3	78.4	12.2	12.2	8.0
	Males	30.4	30.7	12.9	57.7	57.4	80.6	11.9	11.9	6.5
	Females	27.9	28.0	15.4	59.5	59.4	73.1	12.5	12.6	11.5
Lomaiviti	**Persons**	31.4	31.7	20.9	55.7	55.2	72.9	12.9	13.2	6.3
	Males	31.8	32.0	21.2	55.9	55.3	72.9	12.4	12.7	5.7
	Females	31.1	31.3	20.4	55.5	55.1	72.9	13.5	13.6	6.8
Rotuma	**Persons**	30.0	32.6	40.0	59.3	55.1	30.0	10.7	12.4	30.0
	Males	30.0	36.8	28.6	60.2	55.3	35.7	9.8	7.9	35.7
	Females	30.0	29.4	66.7	58.3	54.9	16.7	11.7	15.7	16.7

Table V-2b: Comparison of educational status (%) at the national level by sex and geographic sector in 2007

	Sex	**Attendance status (%)**								
		Attending			**Not attending**					
					Left school			**Never attended**		
		All	**Rur.**	**Urb.**	**All**	**Rur.**	**Urb.**	**All**	**Rur.**	**Urb.**
Fiji	**Persons**	27.6	27.0	28.2	61.8	61.6	62.0	10.6	11.4	9.8
	Males	27.9	27.1	28.6	61.4	61.5	61.2	10.8	11.4	10.2
	Females	27.3	26.8	27.8	62.2	61.7	62.7	10.4	11.4	9.5

3. The at-school population: Level of attendance

After having established in Section 2, the school attendance status of all census respondents in 1996 and 2007, this section focuses in somewhat more detail on those who were attending school at the time of those censuses. Section 3.1 compares the enrollment data of the DOE with school attendance measured during the 2007 Census. Section 3.2 discusses school attendance at the primary, secondary and tertiary level. The school attendance rates at the time of the 1996 and 2007 Censuses are compared.

3.1. Comparison of DOE enrollment figures with 2007 Census school attendance figures

The administrative statistics of the DOE should provide detailed information on school enrollment (as well as retention, and achievement) of the at-school population by age, sex and other characteristics, on a regular basis. Other data collection systems, including the census cannot do this. All a census can do is to provide a snapshot of school attendance at a particular point in time (census night).

Since 1946, all censuses in Fiji have collected basic age and sex specific information with regard to school attendance at the national and sub-national level. This information has also been cross-classified with other census parameters such as ethnicity, geographic sector etc. Unfortunately, very little of this information has been published and what has been published is restricted to the national level. Consequently, until 1986, very little is known about school attendance at the sub-national level. During the 1996 and 2007 Censuses, somewhat more effort has been made to establish a picture of school attendance at the time of these censuses. Moreover, these efforts have not been restricted to the national level but include an analysis at the provincial level as well.

From the outset, it needs to be stressed that school attendance as measured in a census (or survey) is not the same as school enrollment. The “attendance ratios” derived from census data and the “enrolment ratios” published by the DOE will only be entirely consistent if:

- The enrollment records of the DOE are complete, accurate and up to date
- All students enrolled are actually attending school
- There is no significant under-enumeration of the population of school going age during the census

In many cases, one or more of these ideal requirements are not met.

The analysis of census data on school attendance usually starts with a comparison of the two sources of “enrollment” data. In those cases where significant discrepancies are detected, the school attendance ratios derived from the census usually present a more realistic picture of actual school attendance than the enrollment data from the DOE. One reason for this is that the enrollment data from the DOE are not always entirely up to date. For instance, some of those

enrolled at the beginning of the year may have dropped out by the time the census is conducted and this may not (yet) be incorporated in the enrollment records of the DOE. In addition, a complete and up to date picture of enrollment at the time of the census is often not readily available.

In the case of the 2007 Census of Fiji, a comparison has been made between the number of students enrolled at the primary level (Class 1 to 6) by the DOE on 30 June 2007 and the number of students attending Class 1 to 6 at the time of the census on 17 September 2007. The results are shown in Table V-3

Table V-3: Comparison of DOE data on enrollment at the primary level with school attendance at the primary level reported during the 2007 Census

Sex	Total population			Fijians			Indians		
	DOE	2007 Census	% Diff.	DOE	2007 Census	% Diff.	DOE	2007 Census	% Diff.
P	103,641	102,176	-1.4	68,727	65,755	-4.3	30,338	30,557	0.7
M	54,088	53,236	-1.6	36,030	34,406	-4.5	15,559	15,731	1.1
F	49,553	48,940	-1.2	32,697	31,349	-4.1	14,779	14,826	0.3

Source: For DOE data, see: DOE, 2007. Annual Report 2007, Table IX-F: p.115

The overall census count is slightly (1.4 %) lower than the enrollment data of the DOE. However, the difference is entirely caused by Fijian children. Quite amazingly, in the case of the Indian children, the census count of the "at school population" is actually higher than the enrollment figures provided by the DOE! One can hardly imagine that Indian children attending school at the time of the census were not included in the enrollment records of the DOE.

In the South Pacific Region, DOE enrollment figures and census school attendance figures are seldom as close as in the case of the 2007 Census in Fiji.[8] The compatibility of the two completely independent counts of the primary school going population can be seen as further proof that the 2007 Census achieved a high level of completeness.

Unfortunately, DOE statistics are not published by usual place of residence of the students. Consequently, at this stage, the comparison between the two data sets can only validly be carried out at the national and not at the sub-national level.

[8] For instance, during the 1980 Census in PNG, the difference between the two sets of figures was much larger than in the case of Fiji. For many provinces the difference was in double digit figures, especially in the Highlands Region.

3.2. School attendance at the primary, secondary and tertiary level

The total number of students by sex, ethnicity and geographic sector, that attended an educational institution at the time of the 1996 and 2007 Censuses is presented in Table V-1a to c of Section 2. This section looks, in Table V-4a and b, at the school going population at the time of these censuses in a bit more detail. The school-going population is subdivided into those attending Kindergarten, Primary, Secondary and Post-Secondary education. In the case of Fiji:

- Primary includes all those attending Class 1 to Class 6
- Secondary includes all those attending Form 1 to Form 6
- Post-secondary includes:

  -Form 7/Foundation
  -Certificate
  -Diploma
  -Degree

Those children who usually attend school but did not attend at the time of the census interview due to illness or for some other reason are considered as full time students.

Table V-4a: The at-school population by sex and ethnicity in 1996 and 2007

Category	Total Population			Fijians			Indians		
	P	M	F	P	M	F	P	M	F
1996									
Tot. Attend.	**221,174**	**112,747**	**108,427**	**113,247**	**57,944**	**55,503**	**95,008**	**48,047**	**46,961**
Kindergarten	8,455	4,332	4,123	4,415	2,253	2,162	3,282	1,697	1,585
Primary	112,454	58,363	54,091	61,893	32,320	29,573	44,707	22,955	21,752
Secondary	90,566	44,672	45,894	43,234	21,278	21,956	42,389	20,916	21,473
Post-Second.	9,313	5,115	4,198	3,502	1,951	1,551	4,528	2,419	2,109
Others	386	265	121	203	142	61	102	60	42
2007									
Tot. Attend.	**231,050**	**118,999**	**112,051**	**139,703**	**72,196**	**67,507**	**76,351**	**39,007**	**37,344**
Kindergarten	9,510	4,947	4,563	5,907	3,101	2,806	3,000	1,540	1,460
Primary	102,176	53,236	48,940	65,755	34,406	31,349	30,557	15,731	14,826
Secondary	97,974	49,263	48,711	56,592	28,425	28,167	35,498	17,895	17,603
Post-Second.	21,270	11,474	6,237	11,382	6,211	5,171	7,274	3,834	3,440
Other	120	79	41	67	53	14	22	7	15

Table V-4b: The at-school population of by sex and geographic sector in 1996 and 2007

Category	Total Population			Rural			Urban		
	P	M	F	P	M	F	P	M	F
1996									
Tot. Attend.	**221,174**	**112,747**	**108,427**	**116,788**	**59,842**	**56,946**	**104,386**	**52,905**	**51,481**
Kindergarten	8,455	4,332	4,123	3,732	1,954	1,778	4,723	2,378	2,345
Primary	112,454	58,363	54,091	66,247	34,635	31,612	46,207	23,728	22,479
Secondary	90,566	44,672	45,894	44,596	21,995	22,601	45,970	22,677	23,293
Post-Second.	9,313	5,115	4,198	2,040	1,133	907	7,273	3,982	3,291
Others	386	265	121	173	125	48	213	140	73
2007									
Tot. Attend.	**231,050**	**118,999**	**112,051**	**111,291**	**58,234**	**53,057**	**119,759**	**60,765**	**58,994**
Kindergarten	9,510	4,947	4,563	4,857	2,489	2,368	4,653	2,458	2,195
Primary	102,176	53,236	48,940	55,859	29,366	26,493	46,317	23,870	22,447
Secondary	97,974	49,263	48,711	45,313	23,284	22,029	52,661	25,979	26,682
Post-Second.	21,270	11,474	6,237	5,249	3,083	2,166	16,021	8,391	7,630
Other	120	79	41	13	12	1	107	67	40

3.3. School attendance ratios derived from census data

As in the case of enrollment data from the DOE, the level of school attendance derived from a census can be expressed by means of a ratio. These census-based school attendance ratios are defined in a similar way as the GER and NER of the DOE, but are referred to as the Gross and Net Attendance Ratios (GAR and NAR). The NAR is a more useful index of school attendance than the GAR. Users are again reminded that census school attendance ratios derived from a census are not the same as the enrollment ratios derived from the administrative statistics of the DOE.

The numbers attending primary school (class one to six) presented in Table V-4a and b have been converted into GARs. NARs have been derived from 1996 and 2007 Census data as well. However, due to the fact that it proved to be difficult to convert the age of children attending school at the time of the census (available from the basic census tables) into the age of these children at the time of enrollment, these census-based NARs cannot be considered as a very reliable reflection of net school attendance. Users requiring information on net-enrollment are referred to the NERs of the DOE.

The GARs at the primary level by sex, ethnicity and geographic sector for the years 1996 and 2007 are presented in Table V-5a and b. The first Table V-5a shows these GARs for the total population as well as its main ethnic groups (Fijians and Indians) by sex.

Table V-5a: Gross Attendance Ratios (%) for students attending Class 1 to 6 by sex and ethnicity derived from 1996 and 2007 Census data

Ethnic Group	Census	Attend. Class 1 to 6 irrespective of age			Population age 6-11			Gross Attendance Ratio (%)		
		P	M	F	P	M	F	P	M	F
Tot. Pop.	**1996**	**112,454**	**58,363**	**54,091**	**105,169**	**54,465**	**50,704**	**106.9**	**107.2**	**106.7**
	2007	**102,176**	**53,236**	**48,940**	**94,201**	**48,708**	**45,493**	**108.5**	**109.3**	**107.6**
Fijians	**1996**	61,893	32,320	29,573	56,605	29,450	27,155	109.3	109.7	108.9
	2007	65,755	34,406	31,349	60,330	31,277	29,053	109.0	110.0	107.9
Indians	**1996**	44,707	22,955	21,752	43,070	22,117	20,953	103.8	103.8	103.8
	2007	30,557	15,731	14,826	28,395	14,556	13,839	107.6	108.1	107.1

The main feature of this table is the very drastic decrease between 1996 and 2007 in the number of Indian children attending primary school. This decrease is related to the declining level of fertility of the Indian population and the very high emigration rate.[9]

It appears that all GARs in Table V-5a are significantly higher than 100 percent, especially in the case of Fijians. The reason is that a certain proportion of students in class 1 to 6 are older than the standard ages for these classes. This appears to be mainly a problem for Fijian children. The GARs for all individual classes and forms are calculated in a similar way as those for class 1 to 6. The male GARs are very marginally higher than the female ones.

The next Table V-5b presents the GARs for 1996 and 2007 by sex and geographic sector.

Table V-5b: Gross Attendance Ratios (%) for students attending Class 1 to 6 by sex and geographic sector derived from 1996 and 2007 Census data

Geogr. Sector	Census	Attend. Class 1 to 6 irrespective of age			Population age 6-11			Gross Attendance Ratio (%)		
		P	M	F	P	M	F	P	M	F
All	**1996**	**112,454**	**58,363**	**54,091**	**105,169**	**54,465**	**50,704**	**106.9**	**107.2**	**106.7**
	2007	**102,176**	**53,236**	**48,940**	**94,201**	**48,708**	**45,493**	**108.5**	**109.3**	**107.6**
Rural	**1996**	66,247	34,635	31,612	61,321	31,957	29,364	108.0	108.4	107.7
	2007	55,859	29,366	26,493	50,742	26,433	24,309	110.1	111.1	109.0
Urban	**1996**	46,207	23,728	22,479	43,848	22,508	21,340	105.4	105.4	105.3
	2007	46,317	23,870	22,447	43,459	22,275	21,184	106.6	107.2	106.0

Once again, all ratios are higher than 100 percent, but, as expected, more so in the rural than in the urban sector. In conclusion, school attendance, at least at the primary school, has reached a

[9]With regard to fertility, in Chapter VIII it is shown that, during the 1996-2007 intercensal period, the Indian population has reached replacement level fertility. The fast decline in Indian fertility has led to very substantial "ageing at the base" of the Indian age-sex pyramid with much smaller proportions in the school-going age-group (See Chapter II).

high level in Fiji. Furthermore, the GAR is obviously not a very good measure of school attendance in Fiji.

4. Population that has left school: Level of attainment

All censuses in Fiji since 1946 have collected information on the level of formal education completed by all respondents. This includes the "at school" as well as the "not-at school" population. In Section 4, the level of education achieved by the "not-at school" population is further considered. Once again, information for 1996 and 2007 is compared.

The basic information by sex, ethnicity and geographic sector is presented in Table V-6a to c. Users should be aware of the fact that the educational categories in these tables are aggregated categories. For instance, the category "primary" includes all those who have completed some level at primary school as well as those who have completed class 6. Those users who require more detailed information, i.e. the number of persons whose highest level completed is Form 4, are referred to the detailed basic census tabulations of these censuses.

The first of these three tables (Table V-8a) concentrates on the variable sex. The main feature of this table is the enormous improvement in education at the tertiary level (Certificate, Diploma and Degree). This applies to males and even more so to females. Furthermore, the decrease in the number of males and females whose highest level of education is "some or completed primary" is also a good sign. It means that a much larger proportion now proceeds to the secondary level.

Table V-6a: Highest level of education completed by the population that has left school by sex derived from 1996 and 2007 Census data

Cens.	Sex	Total	Less than prim.	Some/ completed primary	Some/ completed secondary	Some/completed tertiary				NS
						Total	Certif. @	Dipl.	Degr. @	
1996	**P**	441,676	347	90,751	309,454	40,068	23,849	9,214	7,005	1,056
	M	226,690	171	45,972	157,259	22,965	13,271	5,223	4,471	323
	F	214,986	176	44,779	152,195	17,103	10,578	3,991	2,534	733
2007	**P**	517,400	-	82,514	343,279	91,156	54,046	22,792	14,318	451
	M	262,173	-	41,221	172,170	48,559	29,253	11,195	8,111	223
	F	255,227	-	41,293	171,109	42,597	24,793	11,597	6,207	228

Notes: @In 1996, those who completed Foundation are included under degree. In 2007, this category in included under certificate.

The next Table V-8b looks at the difference in educational attainment for the main ethnic components of the population. The improvement at the tertiary level is particularly large for Fijians. It must be remembered that many Indians who completed tertiary education in Fiji are now residing overseas.

Table V-6b: Highest level of formal education completed by the population that has left school by ethnicity derived from 1996 and 2007 Census data

Cens	Ethn. gp	Total	Less than prim.	Some/ completed primary	Some/ completed secondary	Some/completed tertiary				NS
						Total	Certif.	Dipl.	Degr.[@]	
1996	**All**	441,676	347	90,751	309,454	40,068	23,849	9,214	7,005	1,056
	Fij	222,245	202	44,842	160,706	16,181	10,721	3,549	1,911	314
	Ind	195,231	131	42,704	133,373	18,331	10,717	4,389	3,225	692
2007	**All**	517,400	-	82,514	343,279	91,156	54,046	22,792	14,318	451
	Fij	276,043	-	38,846	193,948	43,013	27,712	10,499	4,802	236
	Ind	213,668	-	40,337	133,902	39,262	22,365	10,239	6,658	167

Notes: [@]In 1996, those who completed Foundation are included under degree. In 2007, this category in included under certificate.

The final table in this series, Table V-6c, considers differences in educational attainment by geographic sector.

Table V-6c: Highest level of formal education completed by the population that has left school by geographic sector derived from 1996 and 2007 Census data

Cens	Ethn. gp	Total	Less than prim.	Some/ completed primary	Some/ completed secondary	Some/completed tertiary				NS
						Total	Certif.	Dipl.	Degr.[@]	
1996	**All**	441,676	347	90,751	309,454	40,068	23,849	9,214	7,005	1,056
	Rur	233,743	180	60,458	162,155	10,335	7,704	1,823	808	615
	Urb	207,933	167	30,293	147,299	29,733	16,145	7,391	6,197	441
2007	**All**	517,400	-	82,514	343,279	91,156	54,046	22,792	14,318	451
	Rur	254,072	-	48,545	180,074	25,289	17,856	5,390	2,043	164
	Urb	263,328	-	33,969	163,205	65,867	36,910	17,402	12,275	287

Notes: [@]In 1996, those who completed Foundation are included under degree. In 2007, this category in included under certificate

5. Literacy measured from a census

Literacy rates derived from the service statistics of the DOE are necessarily restricted to the population attending an educational institution. Literacy rates for the entire population should preferably be estimated from the results of a specialized literacy survey based on a representative sample of the population. As mentioned in Section 1, a literacy survey should include the testing of reading, writing and understanding skills of all survey respondents.

In the absence of literacy data from a survey, it is often attempted to measure literacy during a census. Some censuses in the South Pacific Region included the question:

"Are you literate in……?"

The problems with this question in a census interview situation are obvious. Most importantly, this kind of question invites a "yes" answer, simply because most respondents prefer to report that they are literate even though this may not be the case. The same applies to proxy respondents reporting on behalf of other household members. In a census, it is not feasible to check (by means of reading, writing and understanding tests), whether the answers given by respondents are correct. In the case of proxy respondents, it is even impossible. Mainly for these reasons, Fiji has never included this direct literacy question on its census interview schedule. It will be realized that most countries are not in a position to conduct an expensive and time-consuming literacy survey and certainly not on a regular basis.

In the absence of direct indices of literacy from survey or census data, the FBoS estimates a proxy index of literacy from census data. These indirect estimates have been derived from data concerning the highest level of education completed by all respondents. In order to do this, consensus is required with regard to a reasonable cut-off point of the level of education completed that separates the literate from the non-literate. Within the South Pacific Region, there has, in the past been much discussion about this cut-off point for literacy. The consensus is that completion of "at least Class 3" should be accepted as the cut-off point for literacy. This is of course not entirely satisfactory since people who completed Class 3 many years ago and dropped out of school soon after completing Class 3, may have lost their literacy skills, particularly if they stopped reading and writing after dropping out of school. On the other hand, people who have not completed Class 3, but have improved their reading and writing skills through informal education, may be literate.

In conclusion, the indirect measurement of literacy from census data concerning educational attainment is not ideal. This proxy index has, however the advantage that it can be derived from educational attainment data for all census respondents. In other words, this proxy index of literacy is available for all geographic subdivisions of the country and subgroups of the population. Moreover, this information is obtained at no additional cost to the census project. For these reasons, this indirect measure of literacy has been widely used throughout the South Pacific Region including Fiji.

The indirect indices of literacy derived from census data that have most frequently been used are the Youth Literacy Ratio (YLR) and the Adult Literacy Ratio (ALR). The former refers to the age group 15 to 24 and the latter to the age group 15 and over. The ALR is a component of several international indices, for instance the UN Human Development Index (HDI). It is assumed that this indirect measure provides a reasonable approximation of those aged 15 and over who can, with understanding, both read and write a short, simple statement on their everyday life.

Table V-7a and b present the indirectly measured ALRs for Fiji by sex, ethnicity and geographic sector derived from 1996 and 2007 Census data on highest level of education completed. The first Table V-8 shows the difference in the level of adult literacy for the total population of the province and its main ethnic components by sex.

Table V-7a: Indirectly measured Adult Literacy Ratios (%) for the population by sex and ethnicity derived from 1996 and 2007 Census data.

Ethnic Group	Census	Pop. age 15 and over compl. at least Class 3			Pop. age 15 and over			ALR (%)		
		P	M	F	P	M	F	P	M	F
Total Pop.	**1996**	**476,466**	**244,067**	**232,399**	**500,913**	**252,722**	**248,191**	**95.1**	**96.6**	**93.6**
	2007	**586,350**	**297,791**	**288,559**	**594,156**	**301,518**	**292,638**	**98.7**	**98.8**	**98.6**
Fijians	**1996**	239,830	120,896	118,934	244,423	122,802	121,621	98.1	98.4	97.8
	2007	317,287	160,287	157,000	319,664	161,507	158,157	99.3	99.2	99.3
Indians	**1996**	209,144	108,806	100,338	228,297	115,265	113,032	91.6	94.4	88.8
	2007	235,635	120,100	115,535	240,787	122,468	118,319	97.9	98.1	97.6

In 1996, adult literacy was already high, especially for Fijians. In that year, the only sub-group with an ALR of less than 90 percent is the female Indian population (88.8 %). In 2007, adult literacy has further increased. Most of those who were illiterate in 1996 have probably passed away during the 11-year interval. The improvement is very significant in the case of Indian females. Moreover, in 2007, the Indian ALR has almost caught up with the Fijian ALR. In 1996, male literacy was still slightly higher than female literacy but, in 2007, the gap has all but disappeared.

Finally, Table V-8 gives an overview of the ALRs at the provincial level in 2007.

Table V-7b: Indirectly measured Adult Literacy Ratios (%) for the population by sex and geographic sector derived from 1996 and 2007 Census data.

Geogr. Sector	Census	Pop. age 15 and over compl. at least class 3			Pop. age 15 and over			ALR (%)		
		P	M	F	P	M	F	P	M	F
All	**1996**	**476,466**	**244,067**	**232,399**	**500,913**	**252,722**	**248,191**	**95.1**	**96.6**	**93.6**
	2007	**586,350**	**297,791**	**288,559**	**594,156**	**301,518**	**292,638**	**98.7**	**98.8**	**98.6**
Rural	**1996**	244,109	127,158	116,951	258,730	132,608	126,122	94.3	95.9	92.7
	2007	279,006	145,447	133,559	283,400	147,645	135,755	98.4	98.5	98.4
Urban	**1996**	232,357	116,909	115,448	242,183	120,114	122,069	95.9	97.3	94.6
	2007	307,344	152,344	155,000	310,756	153,873	156,883	98.9	99.0	98.8

Table V-8: Indirectly measured Adult Literacy Ratios (%) for the population of Fiji and its provinces by sex, ethnicity and geographic sector derived from 2007 Census data.

Province	Total Population					Fijians	Indians
	All Sectors			Rural	Urban		
	Persons	Males	Females				
Fiji	**98.7**	**98.8**	**98.6**	**98.4**	**98.9**	**99.3**	**97.9**
Provinces of the Central Division							
Naitasiri	98.9	99.0	98.8	98.8	98.9	99.4	98.0
Namosi	98.8	98.9	98.6	98.8	-	98.9*	96.9*
Rewa	99.2	99.3	99.2	99.3	99.2	99.4	98.7
Serua	98.4	98.7	98.2	98.4	98.4	99.1	97.3
Tailevu	98.9	99.0	98.8	99.2	98.4	99.4	97.8
Provinces of the Eastern Division							
Lomaiviti	99.5	99.6	99.5	99.4	99.8	99.5*	99.5*
Lau	99.0	99.0	99.0	99.0	-	99.0*	98.7*
Kadavu	99.2	99.3	99.1	99.2	-	99.2*	100.0*
Rotuma	98.4	99.0	97.6	98.4	-	100.0*	100.0*
Provinces of the Northern Division							
Bua	98.3	98.2	98.4	98.3	99.0	98.7	96.0
Cakaudrove	98.2	98.2	98.2	98.2	98.0	98.8	95.6
Macuata	97.8	97.9	97.8	97.6	98.2	99.1	97.0
Provinces of the Western Division							
Ba	98.7	98.7	98.6	98.3	99.0	99.3	98.1
Nadroga	98.5	98.6	98.4	98.4	98.8	99.2	97.5
Ra	98.5	98.6	98.3	98.3	99.0	99.0	97.5

Note: *The Indian population of these provinces is very small

In 2007, the ALR for all provinces has reached a very high level, especially for Fijians. The only province with an ALR of less than 98 percent (and only very marginally so) is Macuata (97.8 %) and this is due to the ALR for Indians in that province (97.0 %). Generally, the Indians in the provinces in the Northern Division have the lowest ALRs.

All ALRs in Table V-7 and 8 seem to be too high to be true. This raises once again the question whether the cut-off point "completed at least class 3", is a true reflection of the real literacy situation in the country. This is an important issue the more so since the ALR is one of the component indices used in the United Nations Human Development Index (HDI). In this respect it is also relevant that PNG measures literacy in the same indirect way as Fiji, with the same cut-off point. However, in recent years, several provinces of that country have carried out a comprehensive literacy survey. During this survey, the reading, writing and understanding skills of respondents were tested. The results from these surveys suggest a significant lower level of literacy than that indicated by the indirect census-based ALRs.

If, in future, the cut-off point for literacy in Fiji is raised, all ALRs from previous censuses should also be adapted to the new standard. Failing to do so will mean that comparability is lost. Moreover, raising the cut-off point will also make the ALRs for Fiji incomparable with those of other countries in the region that have adopted the same cut-off point. It is recommended that if the cut-off point is changed, this should not only be done in Fiji but, at least for all other countries in the South Pacific Region as well.

It is not recommended to include questions in future censuses that attempt to measure literacy directly. In a census, it is not feasible to test the reading, writing and understanding skills of all respondents. Moreover the answers to literacy questions, like all other census questions are, in most cases answered by a proxy-respondent (usually the head of household or his/her spouse). The answers to the literacy question become entirely a matter of opinion. Finally, countries that have attempted to measure literacy directly from a census have almost without exception come to the conclusion that the results overstate the level of literacy. Obviously, many respondents (or the proxy respondent who answers the question for them) are inclined to answer the question whether or not they are literate with "yes" even in case where this is far from the truth.

6. Final comments

The results from the 1996 and 2007 Censuses suggest that, in Fiji, school attendance, particularly at the primary level is very high. Furthermore, an increasing proportion of children continue their education at the secondary and tertiary level. The large increase in the number of persons that have left school with some or completed tertiary education is also very promising.

In the recent past, some concern has been raised about the decreasing quality of education. Unfortunately, the census cannot measure this precisely. Judging from the indirectly obtained ALR from census data regarding level of education completed (using a cut-off point of "at least completed class 3") the level of adult literacy in Fiji is high. However, as explained in Section 5, these census-based ALRs should be interpreted with the utmost caution. In order to assess the literacy situation in Fiji more meaningfully, it is recommended to carry out a comprehensive literacy survey in the near future. This survey should also include other aspects of the quality of education.

Finally, during the 2007 Census, much detailed information was collected concerning further education at the tertiary and vocational level. This information will be included in a set of comprehensive tables in the General Report of this census.

VI. RELIGIOUS AFFILIATION

This chapter is concerned with religion or rather the religious affiliation reported by respondents of the censuses conducted in 1986, 1996 and 2007. It does not discuss the demographic and socio-economic characteristics of persons belonging to the various religious denominations. The reason is that religious affiliation will probably be the subject of a Census Research Monograph in which these and other religion related issues will be explored in depth.

This chapter consists of three sections.

- Section 1 briefly discusses the sources of information concerning religious denomination
- Section 2 highlights some of the problems connected with obtaining information on religious affiliation in a census interview situation.
- Section 3 provides an overview and comparison of the religious affiliation of the people of Fiji as reported during the 1986, 1996 and 2007 Censuses.

1. Data sources

1.1. Administrative statistics

Most churches record basic information concerning all their members. This information includes birth, marriage, death etc. In some countries, all citizens belong, at least for administrative purposes, to the same church (a State Church). The combined records kept by these churches throughout the country can be considered as an almost complete picture of some basic characteristics of the entire population. This is for instance the case in a few north-west European countries, where, after the Reformation in the 16th century, the Lutheran Church became the State Church. In these countries, a church office which is part of the government adopted the recording responsibilities of the Registrar of Birth, Death and Marriages.

Today, most churches continue to register their members. However, since the number of religious denominations has multiplied, registration is dispersed over a very large number of religious institutions, with no central authority amalgamating the data from all these institutions. Moreover, the data of individual religious institutions is affected by over- and undercount as well as other forms of bias. In addition, this data is seldom up to date. Even more importantly, a significant and ever increasing number of people do not belong to any religious denomination. They are (or should) not be registered by any religious institution. In reality, many are probably kept (incorrectly) in the records of a church they formerly belonged to or their parents still belong to.

In conclusion, whatever administrative statistics about religious affiliation are in existence to-day, this information is dispersed over the records of a very large number of institutions. Even if it were possible to get all this information together in one single system, an ever-increasing part

of the population would not be included in this amalgamated database. Consequently, from the statistical point of view this data tends to be of very limited value.

1.2. Censuses and surveys

Since in most countries, complete and reliable administrative statistics concerning religious affiliation are not available, one has to resort to other data collection systems i.e. censuses and surveys. Once again, nationwide (sample) surveys designed to collect detailed information on religious affiliation are seldom if ever conducted. Consequently, most countries collect basic information about "religion" in their censuses. In most cases, this information is restricted to the denomination (or sect) census respondents say they belong to. For instance, in recent censuses in Fiji, the following question was included on the Interview Schedule:

"What is this person's religion?" (State exact denomination or sect)

2. Collection of information on religion during a census

This section briefly discusses some of the problems connected with the collection of sensitive data like religious affiliation in a census.

2.1. Restrictions of the census interview situation

As mentioned on several occasions in this monograph, during a census interview in a household, the enumerator gets the information for all household members from only one person. Most household members are usually not present during the interview, especially when the interview takes place during working hours. The proxy-respondent should preferably be the head of household or his/her spouse. If this person is absent during the interview, the questions should be answered by a senior person in the household. This is an important restriction for the collection of all census information but particularly in the case of sensitive information. This includes amongst others marital status, fertility, income and expenditure, disability and also religious affiliation.

2.2. Response problems

Although the Census Act of most countries states that its citizens are obliged to cooperate with the census enumerators and to report all required information truthfully, an exception is often made for religion. In these countries, respondents who are unwilling to answer the question concerning religious affiliation are, by law, not obliged to do so. This is also the case in Fiji. Fortunately, during censuses in Fiji, very few respondents have so far made use of their right not to answer this question.

2.3. Biased information provided by (proxy) respondents

In those cases, where members of the same household belong to different religious denominations, it is doubtful whether the correct religion will always be reported. Once again, one reason for this is that this information will in most cases be obtained from a proxy respondent. This problem can be particularly serious when the religious affiliation of older children living in the same household as their parents/guardians is reported by these parents/guardians. The available evidence suggests that these close proxy respondents are often inclined to report the same religious affiliation for all members of the household and certainly of their nuclear family. More often than not, this is the religion the proxy respondent him/herself belongs to. This is the reason why many countries do not bother to collect information on religious affiliation for young children (for instance under age 15) but assume that the religion of these children is the same as that of their parents. Censuses in Fiji have never used an age cut-off point for questions regarding religion. The religious affiliation of all respondents, irrespective of age has been recorded during the interview.

This does not mean that respondents who answer this question only for themselves do this always truthfully. However, as in the case of marital status, census enumerators have been instructed to record the religion reported to them, even in cases where they know that the answer given to them is incorrect. In other words, for census purposes, with regard to religion people are what they say they are.

2.4. Open and closed questions

Because of the very large number of churches and sects represented in most countries, the question concerning religious affiliation is usually included on the Interview Schedule as an open question. This is also the case in Fiji. The answers that have been recorded are coded during the data processing phase of the census. The answers to open questions are usually more affected by bias than those that have been pre-coded on the Interview Schedule. This form of bias has probably become more serious with the use of scanning of census data during the processing phase.

3. Religious affiliation

This section deals with the religious affiliation of all persons enumerated in Fiji in 1986, 1996 and 2007.

3.1. Intercensal change for the total population

Table VI-1 presents a general overview of the religious affiliation of the population of Fiji by sex as reported during the 1986, 1996 and 2007 Censuses. It also shows the relative (%) change during the two intercensal periods, 1986-1996 and 1996-2007.

Table VI-1: Change in religious affiliation in broad groups by sex during the 1986-1996 and 1996-2007 intercensal periods

Religious Affiliation	Sex	1986-1996 intercensal period			1996-2007 intercensal period		
		1986 (Nr)	1996 (Nr)	Change (%)	1996 (Nr)	2007 (Nr)	Change (%)
All	**P**	715,375	775,077	8.3	775,077	837,271	8.0
	M	362,568	393,931	8.7	393,931	427,160	8.4
	F	352,807	381,146	8.0	381,146	410,111	7.6
Christian	**P**	378,452	449,482	18.8	449,482	545,517	21.4
	M	192,431	228,482	18.8	228,482	278,307	21.8
	F	186,021	221,000	18.8	221,000	267,210	20.9
Hindu	**P**	273,088	261,097	-4.4	261,097	232,103	-11.1
	M	137,813	132,578	-3.8	132,578	118,514	-10.6
	F	135,275	128,519	-5.0	128,519	113,589	-11.6
Moslem	**P**	56,001	54,323	-3.0	54,323	52,594	-3.2
	M	28,162	27,504	-2.3	27,504	26,692	-3.0
	F	27,839	26,819	-3.7	26,819	25,902	-3.4
Other religion	**P**	5,134	5,043	-1.8	5,043	4,737	-6.1
	M	2,668	2,541	-4.8	2,541	2,441	-3.9
	F	2,466	2,502	1.5	2,502	2,296	-8.2
No religion and Not Stated	**P**	2,700	5,132	90.1	5,132	2,320	-54.8
	M	1,494	2,826	89.2	2,826	1,206	-57.3
	F	1,206	2,306	91.2	2,306	1,114	-51.7

It appears that during both intercensal periods, Christian denominations as a group have increased their numbers at a significantly higher rate than the average increase of the population as a whole. The opposite is true for Hindus and Moslems. However, the decrease in the number of persons affiliated with the Hindu and Moslem religions is mainly due to a very high level of emigration of Indians.

As mentioned, the census question on religious affiliation in Fiji is an open question. After the census schedules had been returned to the FBoS, these answers were coded. Judging from the very drastic change in the number with no religion and not stated religion between 1986 and 2007, it must be concluded that coding may not been performed consistently, especially in 1996.

Table VI-1 provides only a very broad and general picture of change in religious affiliation in Fiji since 1986. This picture needs to be refined. This implies that, first of all, much more detailed information needs to be presented for the main ethnic groups of the country, the Fijians and Indians. This is done in the following sections.

3.2. Change in religious affiliation for Fijians

The religious affiliation as reported by Fijian respondents during the censuses in 1986, 1996 and 2007 and change in religious affiliation during the two intercensal periods is presented in Table VI-2. Since most Fijians belong to a Christian denomination, this category has been broken down into the different Christian churches and sects represented in Fiji.

Table VI-2: Change in religious affiliation of the Fijian component of the population during the 1986-1996 and 1996-2007 intercensal periods

Religious Affiliation	1986-1996 intercensal period			1996-2007 intercensal period		
	1986 (Nr)	1996 (Nr)	Change (%)	1996 (Nr)	2007 (Nr)	Change (%)
All Denominations	**329,305**	**393,575**	**19.5**	**393,575**	**475,739**	**20.9**
Total Christian	**327,767**	**390,380**	**19.1**	**390,380**	**472,682**	**21.1**
-All Nations Christian Fellowship	-	-		-	12,738	-
- Anglican	2,106	2,508	19.1	2,508	2,637	5.1
- Apostles/Pentecostal	-	-	-	-	11,826	-
-Apostles Gospel Outreach Fellowship	-	-	-	-	4,450	-
- Apostolic	-	2,237	-	2,237	-	-
- Assembly of God	12,814	24,717	92.9	24,717	37,840	53.1
- Baptist	-	695	-	695	970	39.6
- Catholic	45,385	52,163		52,163	59,861	
- Christian Outreach Centre	-	-	-	-	1,299	-
- CMF/Every Home	-	5,149	-	5,149	12,545	143.6
- Gospel	-	618	-	618	874	41.4
- Jehovah Witnesses	-	4,815	-	4,815	6,827	41.8
- Latter Day Saints	-	2,253	-	2,253	3,673	63.0
- Methodist	244,381	261,972	7.2	261,972	273,138	4.3
- Presbyterian	99	105	6.1	105	304	189.5
- Salvation Army	-	628	-	628	791	26.0
- SDA	13,269	19,896	49.9	19,896	28,705	44.3
- Other Christian	9,713	12,624	30.0	12,624	14,204	12.5
Total Hindu	**699**	**864**	**23.6**	**864**	**1,101**	**27.4**
Total Moslem	**326**	**324**	**-0.6**	**324**	**858**	**164.8**
Total other religions	**74**	**458**	**518.9**	**458**	**761**	**66.2**
Total: No religion and N.S.	**439**	**1,549**	**252.8**	**1,549**	**337**	**-78.2**

The information in Table V-2 presents a very volatile picture of change in religious affiliation amongst Fijians. This is partly due to the rapid increase in the number of Christian churches and sects since 1986. Many of these new churches and sects have been added to the census code list. However, considering the very large number of Christians, whose religion in 2007 was still coded as "Other Christian" much more work on this code list needs to be done.

Furthermore, many Fijians have, since 1986 moved away from the "established" churches, especially the Methodist Church and joined one of the new Christian churches/sects.

In interpreting the results in Table VI-2, it must be mentioned that there may be a certain amount of response error in the information regarding religion collected in a census. Users are reminded again that the information collected in a census interview is in most cases not provided by the individual him/herself but by a proxy respondent. These proxy-respondents may in some case have been inclined to report their own religion for other household members. It is unlikely that, in all cases, absent household members would have agreed with the religion allocated to them.

Finally, the code list for Christian denominations needs to be improved. In 2007, there are too many Christians whose religion has been coded as "Other Christian".

3.3. Change in religious affiliation for Indians

Most Indians in Fiji are affiliated with Hindu or Moslem denominations. However, a significant proportion of them now belong to one of the Christian churches or sects. The change in religious affiliation of Indian respondents during the 1986, 1996 and 2007 Censuses is presented in Table VI-3.

Since 1986, the number of Hindus and Moslems has decreased but most of this decrease is due to a high level of emigration of Indians. As in the case of Table VI-2 (for Fijians), Table VI-3 also presents a volatile picture of religious affiliation. However, in this case, the main reason is different. The census code list of Hindu denominations used by the FBoS clearly does not make much sense. In particular, it appears that in 1996, a very large number of cases in that year have been dumped in the rest category "Other Hindu" should probably have been coded as "Arya Samaj".

The code list of Moslem denominations is equally flawed. It seems that a very large proportion of Moslems has been dumped in the rest category "Other Moslems". Coding of Moslem religions in 1996 was particularly unsatisfactory.

Table VI-3: Change in religious affiliation of the Indian population during the 1986-1996 and 1996-2007 intercensal periods

Religious Affiliation	1986-1996 intercensal period			1996-2007 intercensal period		
	1986 (Nr)	1996 (Nr)	Change (%)	1996 (Nr)	2007 (Nr)	Change (%)
All Denominations	**348,704**	**338,818**	**-2.8**	**338,818**	**313,801**	**-7.4**
Total Hindu	**271,994**	**259,775**	**-4.5**	**259,775**	**228,706**	**-12.0**
- Arya Samaj	15,361	9,493	-38.2	9,493	19,195	102.2
-Kabir Panthi	-	73	-	73	784	974.0
- Sanathan	240,035	193,061	-19.6	193,061	184,735	-4.3
-Satya Sai Baba	-	52	-	52	840	1,515.4
- Other Hindu	16,598	57,096	244.0	57,096	23,152	-59.5
Total Moslem	**55,442**	**53,753**	**-3.0**	**53,753**	**51,031**	**-5.1**
- Ahmadhya	2,420	1,944	-19.7	1,944	4,478	130.4
- Sunni	46,454	32,082	-30.9	32,082	37,311	16.3
- Other Moslem	6,568	19,727	200.4	19,727	9,242	-53.2
Sikh	**4,674**	**3,076**	**-34.2**	**3,076**	**2,465**	**-19.9**
Total Christian	**15,699**	**20,719**	**32.0**	**20,719**	**30,734**	**48.3**
- Protestant	9,294	14,707	58.2	14,707	24,093	63.8
- Catholic	4,099	3,520	-14.1	3,520	3,230	-8.2
- Other Christian	2,306	2,492	8.1	2,492	3,411	36.9
Other religions	**126**	**360**	**185.7**	**360**	**384**	**6.7**
No religion and N.S.	**769**	**1,135**	**47.6**	**1,135**	**481**	**-57.6**

3.4. Interprovincial comparison

Table VI-4a and b provide a comparison at the provincial level of religious affiliation of Fijians and Indians (in broad groups) reported during the 2007 Census. Fijians in all provinces are with few exceptions, Christians. In all provinces, except Namosi, Serua and Cakaudrove, more than 50 percent of the population is Methodist. These three provinces, Serua, Cakaudrove and especially Namosi are the three provinces where a large proportion of the population is Catholic.

Table VI-4a: Religious affiliation at the provincial level (in broad groups) for Fijians as reported during the 2007 Census (in %)

Province	All (Nr)	Christians (%)				Hindu (%)	Moslem (%)	Other Rel. (%)	NS (%)
		All	Cath.	Protestant					
				Meth.	Other				
Fijians Total	**475,739**	**99.4**	**12.6**	**57.4**	**29.4**	**0.2**	**0.2**	**0.2**	**0.1**
Provinces of the Central Division									
Naitasiri	93,124	99.3	10.4	58.0	30.9	0.2	0.2	0.2	0.1
Rewa	62,173	99.4	12.1	54.0	33.3	0.1	0.1	0.3	0.1
Tailevu	40,186	99.4	6.2	64.6	28.6	0.2	0.2	0.1	0.0
Namosi	6,159	99.8	53.5	20.1	26.2	0.1	0.0	0.0	0.0
Serua	11,138	98.9	22.7	47.9	28.3	0.4	0.2	0.3	0.1
Provinces of the Eastern Division									
Kadavu	9,964	99.9	2.3	82.6	15.1	-	-	0.0	0.0
Lomaiviti	14,822	99.9	12.0	73.3	14.5	0.0	0.0	0.0	0.1
Lau	10,540	99.5	3.4	84.3	11.9	0.0	0.0	0.5	-
Rotuma	89	100.0	25.8	52.8	21.3	-	-	-	-
Provinces of the Northern Division									
Bua	11,183	99.8	13.5	68.2	18.0	0.0	0.1	0.0	0.0
Cakaudrove	35,978	99.9	31.4	46.9	21.8	0.1	0.1	0.0	0.0
Macuata	28,197	98.9	14.0	57.4	27.5	0.3	0.8	0.0	0.1
Provinces of the Western Division									
Ba	96,852	99.0	10.4	54.6	34.0	0.5	0.4	0.1	0.1
Nadroga	35,075	99.5	8.1	57.5	33.9	0.3	0.2	0.0	0.0
Ra	20,259	99.6	11.2	55.7	32.7	0.3	0.0	0.0	0.0

Table VI-4b: Religious affiliation at the provincial level (in broad groups) for Indians as reported during the 2007 Census (in %)

Province	All (Nr)	Hindu (%)				Moslem (%)				Sikh	Chris (%)	Oth Rel (%)	NS (%)
		All	Ar Sam	San	Oth	All	Ahm	Sun	Oth				
Indians Total	**313,801**	**72.9**	**6.1**	**58.9**	**7.9**	**16.3**	**1.4**	**11.9**	**2.9**	**0.8**	**9.8**	**0.1**	**0.2**
Provinces of the Central Division													
Naitasiri	58,496	72.3	12.3	48.0	12.0	15.2	3.9	7.0	4.3	0.9	11.4	0.1	0.1
Rewa	24,082	69.9	8.9	35.2	25.9	13.2	2.6	5.8	4.9	0.7	15.4	0.3	0.3
Tailevu	14,212	77.0	8.5	65.1	13.4	14.5	1.4	8.9	4.2	0.8	7.6	0.0	0.1
Namosi	514	60.1	5.3	41.8	13.0	22.8	0.0	22.8	0.0	1.6	14.8	0.6	0.2
Serua	5,830	81.0	8.2	45.2	27.6	8.3	1.3	2.3	4.7	0.2	10.4	0.0	0.1
Provinces of the Eastern Division													
Kadavu	49	38.7	2.0	22.4	14.3	10.2	6.1	2.0	2.0	-	51.0	-	-
Lomaiviti	494	51.2	8.9	39.7	2.6	9.7	4.0	4.0	1.6	-	39.9	0.8	-
Lau	88	45.5	-	-	45.5	3.4	-	1.1	2.3	5.7	45.5	-	-
Rotuma	20	-	-	-	-	-	-	-	-	-	100.0	-	-
Provinces of the Northern Division													
Bua	2,367	77.6	1.0	76.6	0.0	17.2	8.2	8.9	0.0	0.0	4.9	0.0	0.3
Cakaudrove	7,929	64.4	7.5	56.3	0.7	18.4	1.1	16.6	0.7	0.1	16.8	0.1	0.2
Macuata	42,550	74.8	6.9	67.0	0.9	16.9	0.5	14.9	1.4	0.2	7.9	0.2	0.1
Provinces of the Western Division													
Ba	126,142	72.0	3.0	64.8	4.2	17.8	0.6	14.7	2.5	1.1	8.9	0.1	0.2
Nadroga	22,140	72.6	2.7	69.4	0.6	18.0	0.2	15.7	2.1	0.7	8.4	0.1	0.2
Ra	8,888	85.0	1.5	60.7	22.7	9.4	0.1	4.9	4.4	0.5	5.1	0.0	0.1

3.5. Final comment

Prior to the next census, the code list of religions in Fiji should be updated. This applies to Christian but even more to Hindu and Moslem denominations. The updating of the code list should be based on a proper pretest. Unfortunately, the pretests and pilot test carried out before the 1986, 1996 and 2007 Censuses failed to pick up the deficiencies in the census code list on religion.

VII. MORTALITY

The study of mortality is concerned with the vital event death. Mortality is one of the three demographic processes that change the characteristics of a population.

The Introduction of this Analytical Report distinguishes between two different approaches towards data collection viz. registration or recording and interviewing. With regard to the collection of vital statistics (births and deaths) in Fiji, these two systems have, since 1946, operated side by side.

- Registration

  In most countries, including Fiji, both the Civil Registration System (CRS) of the Registrar General's Office (RGO) and the National Health Information System (NHIS) of the Department of Health (DOH) register the events death (and birth) if and when they occur. Mortality (and fertility) parameters are calculated directly from the registered data.

- Interview

  A set of retrospective questions concerning mortality (and fertility) was included in a census/survey interview schedules since 1946. Mortality (and fertility) parameters were estimated indirectly from this information.

Presently, in many statistically underdeveloped countries, the registration of vital events by the CRS and NHIS remains incomplete and deficient. In order to establish a picture of the mortality (and fertility) situation and trends, many of these countries continue to rely on the second approach towards data collection: the collection of the relevant information during census/survey interviews. This is the case in several countries in the South Pacific Region, especially those that were colonized by the British, including Fiji.

In recent decades, the civil registration of vital events in some countries in the region has improved. However this mainly applies to some Polynesian countries. Unfortunately, civil registration in several Melanesian countries has only very marginally improved or not at all. The latter is especially the case for Papua New Guinea and the Solomon Islands.[1] Fiji is a case in between.

This chapter is mainly concerned with the results of the mortality analysis based on these two different approaches to mortality estimation. The various techniques that have been

[1] Although countries like Papua New Guinea and the Solomon Islands have a Civil Registration Act, this act cannot yet be enforced. In these countries, the registration of vital events, including death is still more an exception than a rule. In several countries in the Central and Eastern Pacific, a CRS has been in existence for a long time (in several cases more than 100 years). However, in most of these countries, the registration of vital events is still not complete.

utilized are not explained in detail. This has been done in a forthcoming FBoS monograph on mortality.[2] Moreover, many of the techniques that have been used are the same as the ones used in the 1996 Census analysis. The technical appendices of the Analytical Report of this census have also documented these techniques.

Chapter VII consists of three parts, A, B and C.

- Part A is concerned with the direct computation of mortality parameters from death registration data from the NHIS.[3]

- Part B focuses on the indirect estimation of mortality parameters from census data, especially the 2007 Census.

- Part C discusses the present mortality situation and recent mortality trends in Fiji, based on the results obtained in Section A and B. It also makes recommendations concerning the collection and analysis of mortality data in the future.

[2]Bakker, 2013 (forthcoming)

[3] Part A is partly based on an analysis of NHIS data presented in a paper entitled "The Mortality Transition in Fiji since 1986" (Bakker, 2011)

PART A

DIRECT ANALYSIS OF DEATH REGISTRATION DATA

1. Data Sources

This section assesses the two sources of death registration data in Fiji: the Civil Registration System (CRS) and the National Health Information System (NHIS).

1.1. Civil Registration System

Most countries with a complete, accurate and up to date CRS derive their mortality (as well as fertility) indices from the age and sex specific death (and birth) statistics, which this legal/administrative system produces as a byproduct. Fiji's Civil Registration Act states that it is the responsibility of any relative of the deceased or any person present at the death to register the death.[4] This act also details the death (as well as birth) registration procedure that has been adopted.[5] Since a very large proportion of all deaths in Fiji occur in a hospital or other health institution or at least with a health professional in attendance, health officials play a crucial role in the registration of death. They complete a "Medical Certificate of Cause of Death" in duplicate for all deaths they attend to.[6] One copy of this certificate is sent to the Registrar General's Office (RGO). The other is given to the next of kin who has the duty to present it to the RGO. In many cases, the latter does not happen and the RGO is still unable to enforce the act. Consequently, many deaths are not recorded in Fiji's CRS.

A certificate used for the registration of death does not only state the cause of death (and if applicable, the antecedent cause of death). It also records the basic characteristics of the deceased person that are of importance for legal/administrative as well as statistical purposes. The most crucial information is the age at death, sex, marital status, religion and usual place of residence of the deceased person. Other characteristics, like occupation may be added. Unfortunately, the Medical Certificate of Cause of Death that is being used in Fiji is not yet optimal.

Fiji's CRS has been in existence for more than 100 years. Although there has been some improvement in the system, the coverage of vital events, particularly deaths, remains very incomplete and deficient. Moreover, the registered deaths cannot be considered as a representative sample of all deaths. The death of less advantaged people (people from remote and not easily accessible areas and the poor) is most seriously affected by under-registration.

Finally, the CRS does not publish detailed information on mortality by age, sex, ethnicity and other characteristics of the deceased. This information should be published in the Annual Reports of the CRS. This makes it difficult to assess progress.

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[4] The person who registers the event can also be the occupier of the house where the death took place or any person who undertakes to cremate or bury the deceased.

[5] A description of the registration procedure can also be found in an annual FBoS publication: Vital Statistics Fiji".

[6] In those cases where the death takes place at a location where no doctor, registered nurse or midwife is available, the pastor or priest who officiates at the burial is obliged to write a letter. On the basis of this letter, the death can be registered.

All assessments of the CRS in the past concluded that it is not very likely that the coverage and quality of its data will improve significantly in the near future.[7] So far, Fiji's CRS has not made any statistically significant contribution to the country's database on mortality.

1.2. National Health Information System

The source of the basic data is the same as in the case of the CRS, namely the Medical Certificate of Cause of Death. Copies of the completed certificates are sent to the headquarters of the DOH in Suva. Here the information is compiled and presented in tabulated form: deaths by age, sex and ethnicity. So far, the analysis of this data has been carried out by FBoS or by individual researchers. Because of the limited amount of information collected on the death certificate, the analysis tends to be limited. Nevertheless, since the 1970s, abridged lifetables by sex and ethnicity have, on several occasions been produced from this data, but usually after the results of a census became available. The reason is that, although the NHIS can provide the numerator of death (as well as birth) rates, it cannot provide the denominators of these rates. Precise denominators become available only once every ten years, after a census has been conducted. During the intercensal period, the FBoS attempts to provide an approximation of these denominators through demographic bookkeeping or by means of a population projection.[8]

Until recently, the completed death certificates seldom provided a precise description of the usual place of residence of the deceased. This information is needed for the production of sectoral (rural and urban) lifetables and lifetables for the geographic subdivisions of the country, most importantly the provinces. The absence of complete and accurate data concerning the usual place of residence of deceased persons implies that analysis based on NHIS data was and still is restricted to the national level. The DOH is now addressing this problem. However, in practice, recording by health personnel of the usual place of residence of the deceased remains in many cases inadequate. This information will only become statistically useful when all death certificates provide a detailed and precise description of the usual place of residence of deceased persons. This implies that all those completing death (as well as birth) certificates should have a detailed knowledge of the delineation of Fiji's geographic subdivisions, particularly its urban areas. In comparison, indirect estimation of mortality from census data, has, since 1996, already been carried out at the sub-national level (i.e. the provinces) and since 1976 for the geographic sectors (rural and urban).

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[7] Bakker, 2006.

[8] In demographic bookkeeping, a baseline population, P_1 is selected. In Fiji this is the population enumerated during a census. Subsequently all births (B) and in-migrants (I) are added to this baseline population and deaths (D) and out-migrants (O) are subtracted. The population at any time after the baseline (P_2) can be calculated from:

$$\mathbf{P_2 = P_1+B-D+I-O}$$

Given completeness and accuracy of birth, death and migration registration, demographic bookkeeping will provide a reasonable estimate of the population at any point in time. In reality, in many countries, including Fiji, registration of these events is not complete and accurate. Consequently, the further one is removed from a census, the more biased the population base. Alternatively, the population can be projected using the age-sex structure from the most recent census as the baseline. Furthermore, this approach requires clearly defined fertility, mortality and migration assumptions for the entire projection period.

Although the number of deaths registered by the NHIS in one year is always significantly higher than the number of legally recorded deaths by the CRS, the coverage of the NHIS is not yet complete. The 2006 review of the NHIS identified some of the remaining loopholes in this data collection system viz.:

- In the more isolated parts of the country, a death sometimes occurs without a doctor or nurse in attendance. In that case, it is the task of the pastor/priest officiating at the funeral/cremation to write a letter to the Registrar General's Office. It is assumed that most district nurses responsible for the area where this death occurred will know about the event and that they will take appropriate action. This assumption may not always be correct. Furthermore, the level of completeness and quality of NHIS data should not be dependent on the local knowledge of district nurses. The system should be waterproof.

- It is likely that in some borderline cases, a live birth may have been confused with a still birth. The official definition of a stillbirth is so complicated that it cannot be expected that other than trained medical personnel will be able to make the distinction between a live and still birth in these borderline cases. If a live birth is registered as a stillbirth, there will be no birth and no death certificate but only a stillbirth certificate.

A very important problem with the death (as well as birth) registration system of the NHIS remains the timely availability of the data. There tends to be a significant time lag between the registration of vital events by health officials (usually immediately after these events occur) and the time that all certificates have reached the office of the Medical Statistician in Suva and have been processed by this office. Completed forms are sometimes not forwarded, mislaid or not entered into the system. This is not a problem of registration but a problem of management and efficiency. The NHIS has now partly been computerized. Unfortunately, on line registration is presently mainly restricted to events that occur in the four main hospitals of the country.

As mentioned, the pre-censal reviews of the CRS also included an assessment of the level of completeness and accuracy of the data collected by the NHIS. The most recent and also most comprehensive review of NHIS data, carried out prior to the 2007 Census concluded that, although coverage of the NHIS has improved over time, not all vital events are recorded by the system. This is particularly so in the case of vital events occurring in isolated parts of the county where a health practitioner may not be attending to a death or birth.[9]

[9] It needs to be re-iterated that the NHIS is not a legal-administrative system like the CRS but a statistical system based on medical records produced by its own network throughout the country. It can therefore not replace the CRS. Furthermore, it will be realized that, with regard to the more specialized information [9]collected by the NHIS, such as information concerning morbidity, cause of death etc., there is no alternative data collection system.

In sum, the DOH has its own data collection system using its network of health facilities and health practitioners. Contrary to the legal CRS, the NHIS is a statistical system. Given complete and accurate coverage of death and birth registration and timely processing of the collected information, the NHIS should be able to provide annual updates of mortality (as well as fertility) levels and trends. Health personnel not only register vital events but also collect information on morbidity, mortality, cause of death, fertility, reproductive health, family planning etc. [10] This information is used by the DOH for monitoring, evaluation and planning purposes.

2. Methodology

There are two different approaches to the study of demographic processes. For instance in the case of mortality:

- The longitudinal (or cohort) approach follows all persons born in a particular year (i.e. the year 1900) through life. The subject of the study is the mortality experience of the cohort members. This type of study can only be completed when all members of the cohort have passed away. It may be assumed that in 2012, all members of the 1900 birth cohort in Fiji have passed away. This means that, in theory, a longitudinal study of the mortality experience of the 1900 birth cohort in Fiji can now be carried out. In practice, this is however not possible since there is no complete and accurate record of the death by age and sex of most of the members of this cohort, especially those who died a long time ago.[11]

- Most policy makers and planners are more interested in the cross-sectional or period study of mortality. This kind of study is concerned with the mortality experience of a population during a fixed period of time, often a calendar year, i.e. census year 2007. The population whose mortality experience is studied does not belong to one birth cohort but to more than one hundred birth cohorts.[12] Cross-sectional or period analysis of mortality therefore focuses on mortality in a hypothetical or synthetic cohort. Planners often consider the results of a longitudinal study of mortality as mainly interesting from the historical point of view but not so much for practical day to day monitoring and evaluation of the mortality situation, health projects etc.

The direct analysis of mortality from death registration data presents relatively few problems compared to the indirect analysis from census (survey) data (discussed in Part

[10] Morbidity is the study of disease. Morbidity data is usually converted into incidence, prevalence, case and case fatality rates.

[11] Because of the lack of complete and reliable statistics concerning death by age and sex, spanning a period of at least 100 years, a cohort study of mortality has never been carried out in any of the countries of the South Pacific Region, including Fiji. Longitudinal (cohort) studies of mortality are restricted to a relatively small number of mainly western countries where a death registration system has provided complete and accurate information on death by age and sex over a period of at least one hundred years.

[12] For instance, on 16 September 2007 (Census Night), a person 0 years old belongs either to the 2007 or 2006 birth cohort. If the oldest person at the time of the 2007 Census was 106 years, he/she belongs either to the 1901 or 1900 birth cohort.

B). The direct methodology is straightforward. Moreover, contrary to fertility and migration analysis, the analysis of mortality is further simplified by the fact that each individual in the population will undergo the event of death once and only once. At any age x:

$$\mathbf{q_x + p_x = 1 \text{ (or } 100\ \%)}$$

where q_x is the probability of dying at age x and p_x is the probability of surviving at age x.

In addition, in the case of the event death, personal preference and choice only play a minor role. The wish to survive is almost universal. The selection of the denominator of death rates or the population "at risk of undergoing the event death" is therefore theoretically straightforward. For instance in the case of the Crude Death Rate (CDR), it is the total population and for age specific death rates (ASDR), the total population in the specified age group.[13]

The analysis in Part A is concerned with cross-sectional or period analysis of mortality data collected by Fiji's NHIS.

3. Computation of mortality parameters from NHIS data

Age at death is the central variable in most mortality research and it is, together with sex, the crucial variable for the construction of lifetables. All death certificates should provide an accurate age at death.

In reality, all information concerning a deceased person is usually provided by the next of kin or another proxy respondent. They may not know the age of the deceased precisely. However, as long as this information is provided by a close family member, it may be expected that it is reasonably accurate. This is sometimes not the case if a person who is not a close family member provides the information.

In most, but not all, of its recent publications, the NHIS provides the age of death of all deceased persons. [14]

[13] The conventional construction of a lifetable from death registration data by age and sex is part of any basic demographic handbook and will not be explained here.

[14] For reasons unknown, this is not the case for the years 1998 and 1999. For these two years, the NHIS records show a significant number of cases with Not Stated age at death.

3.1. Based on NHIS data before 2002

During the 1986 and 1996 Census analysis, an evaluation of NHIS data was included. From data on death by age (in five-year age groups), sex and ethnicity, age-specific death rates (ASDR) have been calculated, using the census age-sex structures as denominators. The aggregation of the data into five-year age groups diminished the impact of misreporting of age at death very significantly. In spite of aggregating the data into five-year age groups, the resulting age-sex specific pattern of mortality still showed some irregularities for the Fijian as well as Indian component of the population. Several possible reasons were identified:

- The number of deaths in one year, particularly for the five-year age-sex cells between age 5 and age 40, tends to be low. This leads to significant chance fluctuations in the ASDRs for these age-sex groups.

- For a significant number of deaths, especially those of elderly people, the recorded age at death is affected by mis-reporting. In Chapter II, it was noted that during the early censuses until 1966, age reporting was not yet very accurate. Although analysis of the magnitude of age-misreporting during censuses suggests that age reporting has improved drastically over the last 50 years it is likely that the accuracy of the age at death on death certificates has not improved to the same extent, especially, as mentioned, in the case of proxy respondents who are not close family members reporting the age at death. In Fiji, this remains to some extent a problem for some deceased persons dying at a very advanced age.

In order to diminish the irregularities in the data, the ASDRs were re-calculated but now based on all deaths that occurred during a three-year period centered on census years1986 and 1996: the period 1985-1987 and 1995-1997. This led for all sub-populations to a significantly less erratic pattern of mortality. However, the anomalies had not entirely been removed. Some further adjustment was therefore carried out, using principal component analysis. A three component fit of the ${}_nq_x$ values derived from the empirical ASDRs led to a sufficiently smooth pattern of age specific mortality. It is important to note that this adjustment procedure only affects the pattern but not the overall level of mortality. The fitted ${}_nq_x$ values were used for the computation of abridged lifetables by sex and ethnicity.

Next in 2003, the above procedure was again repeated using NHIS data for the three-year period 2000-2002 and centered on 2001, the mid-point between the 1996 Census and the census scheduled for the year 2006.[15] The 2001 age-sex structure was obtained by projecting the 1996 Census age-sex structure over a five-year period. The resulting ASDRs for the 2000-2002 period are therefore almost certainly less precise than those derived for the 1995-1997 and 1985-1987 periods.[16]

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[15] Unfortunately, because of the elections held in 2006, the government decided to postpone the 2006 Census to 2007.

[16] The analytical procedure used in these applications has been detailed in the forthcoming FBoS monograph (Bakker, 2013).

3.2. Based on recent NHIS data

Table VII-A1 presents the total number of deaths by sex and ethnicity registered by the NHIS for every year between 1996 and 2008.

Table VII-A1: Total number of deaths per year by sex and ethnicity recorded by the NHIS between 1996 and 2008

Year	Total			Fijians			Indians			Others		
	P	M	F	P	M	F	P	M	F	P	M	F
1996	4,604	2,642	1,962	2,427	1,332	1,095	1,983	1,176	807	198	137	61
1997	5,578	3,217	2,361	2,937	1,595	1,342	2,392	1,462	930	249	160	89
1998	5,240	2,918	2,322	2,807	1,521	1,286	2,175	1,521	1,286	258	151	107
1999	5,667	3,257	2,410	2,978	1,637	1,341	2,424	1,467	957	265	153	112
2000	5,894	3,415	2,479	3,144	1,690	1,434	2,509	1,580	929	241	145	96
2001	5,774	3,321	2,453	3,222	1,737	1,485	2,303	1,420	883	249	165	85
2002	5,632	3,162	2,470	3,132	1,686	1,446	2,224	1,305	919	276	171	105
2003	6,116	3,407	2,709	3,461	1,850	1,611	2,380	1,390	990	275	167	108
2004	5,628	3,150	2,478	3,106	1,655	1,451	2,255	1,333	922	267	162	105
2005	5,964	3,376	2,588	3,358	1,819	1,539	2,364	1,406	958	242	151	91
2006	6,154	3,489	2,665	3,467	1,870	1,597	2,436	1,463	973	251	156	95
2007	6,359	3,614	2,745	3,760	2,004	1,756	2,283	1,435	848	316	175	141
2008	6,471	3,519	2,952	3,806	1,956	1,850	2,352	1,366	986	313	197	116

Source NHIS

The variation in the figures suggests that the quality of the data is uneven. The most likely explanation is that this is mainly due to processing of the data. The number of registered deaths for the period considered in this section: 2006-2008, is fairly consistent, but this consistency was only obtained after much follow-up work by FBoS and DOH staff. The initial data that was presented for the analysis was seriously flawed.

As mentioned, in the analysis of historical NHIS data, irregularities in the ASDRs were significantly diminished by aggregating the data over a number of years. In the present analysis, the recorded deaths for the years 2006, 2007 and 2008 (centered on the 2007

Census) have been aggregated. The results, the total number of deaths for the period 2006-2008, by age at death, sex and ethnicity are presented in Table VII-A2.

Table VII-A2: Aggregated number of deaths for the period 2006-2008, by age, sex and ethnicity based on data recorded by the NHIS.

Age Group	Total Population			Fijians			Indians		
	B.S.	M	F	B.S.	M	F	B.S.	M	F
< 1	1,034	554	480	705	385	320	295	154	141
1-4	393	217	176	303	159	144	72	46	26
5-9	146	87	59	97	54	43	45	31	14
10-14	142	83	59	91	56	35	48	27	21
15-19	244	147	97	142	84	58	86	50	36
20-24	322	205	117	171	101	70	130	88	42
25-29	350	208	142	186	106	80	145	94	51
30-34	344	184	160	211	108	103	111	65	46
35-39	539	302	237	287	147	140	213	133	80
40-44	801	475	326	437	233	204	332	220	112
45-49	1,307	800	507	691	373	318	535	376	159
50-54	1,616	1,004	612	866	505	361	686	458	228
55-59	1,907	1,131	776	1,050	585	465	787	505	282
60-64	2,144	1,230	914	1,186	660	526	866	519	347
65-69	2,119	1,182	937	1,219	650	569	812	473	339
70-74	1,837	983	854	1,121	573	548	638	365	273
75-79	1,551	820	691	949	498	451	510	270	240
80-84	1,028	496	532	640	294	346	334	167	167
85-89	727	338	389	466	196	270	230	123	107
90-94	249	103	146	131	42	89	104	53	51
95 +	184	73	111	82	21	61	94	47	47
Total	**18,984**	**10,622**	**8,362**	**11,031**	**5,830**	**5,201**	**7,073**	**4,264**	**2,809**

Source Derived from NHIS data for the years 2006-2008.

Aggregation of the data over a three-year period has clearly led to a less erratic sequence of the numbers of deaths in the subsequent five-year age groups.

From the number of deaths in each of the age-sex cells in Table VII-A2, central ASDRs have been calculated. The number of deaths in each of the five-year age groups has been divided by the mid-period population (in this case the population enumerated during the 2007 Census).[17]Next, in order to get annual rates, the ASDRs for the three-year period have been divided by 3. The results, the central ASDRs for the total population and for Fijians and Indians are presented in Table VII-A3a-c respectively.

[17] It will be noted that it has not been attempted to project the 2007 Census population back from the 16th of September 2007 (Census Date) to the 30th of June 2007 (exactly the mid-point of the period under consideration). The impact of this on the results is negligible. Moreover, this adjustment procedure may be counter-productive if the assumptions underlying the backward projection are incorrect.

Table VII-A3a: Central ASDRs for the total population by sex in census year 2007.

Age Group	Both Sexes			Males			Females		
	Deaths 2006-2008	Census Pop. 2007	ASDR	Deaths 2006-2008	Census Pop. 2007	ASDR	Deaths 2006-2008	Census Pop. 2007	ASDR
< 1	1,104	17,855	.0206	598	9,136	.0218	506	8,719	.0193
1-4	323	64,863	.0017	172	33,699	.0017	151	31,164	.0016
5-9	146	78,019	.0006	87	40,441	.0007	59	37,578	.0005
10-14	142	82,384	.0006	83	42,369	.0007	59	40,015	.0005
15-19	244	79,518	.0010	147	40,818	.0012	97	38,700	.0008
20-24	322	80,352	.0013	205	41,325	.0017	117	39,027	.0010
25-29	350	73,487	.0016	208	37,390	.0019	142	36,097	.0013
30-34	344	63,535	.0018	184	32,825	.0019	160	30,710	.0017
35-39	539	56,552	.0032	302	28,778	.0035	237	27,774	.0028
40-44	801	56,274	.0047	475	28,598	.0055	326	27,676	.0039
45-49	1,307	50,322	.0087	800	25,835	.0103	507	24,487	.0069
50-54	1,616	40,009	.0135	1,004	20,215	.0166	612	19,794	.0103
55-59	1,907	31,161	.0204	1,131	15,735	.0240	776	15,426	.0168
60-64	2,144	24,120	.0296	1,230	11,956	.0343	914	12,164	.0251
65-69	2,119	16,808	.0420	1,182	8,098	.0487	937	8,710	.0359
70-74	1,837	10,110	.0606	983	4,716	.0695	854	5,394	.0528
75-79	1,551	6,138	.0842	820	2,811	.0972	691	3,327	.0692
80-84	1,028	3,236	.1059	496	1,376	.1202	532	1,860	.0953
85-89	727	1,638	.1479	338	702	.1605	389	936	.1385
90-94	249	572	.1451	103	212	.1620	146	360	.1352
95 +	184	318	.1929	73	141	.1726	111	177	.2090
Total	**18,984**	837,271	.0076	**10,622**	427,176	.0083	**8,362**	410,095	.0068

Source Derived from 2006-2008 NHIS data

Table VII-A3b: Central ASDRs for Fijians by sex in census year 2007.

Age Group	Both Sexes			Males			Females		
	Deaths 2006-2008	Census Pop. 2007	ASDR	Deaths 2006-2008	Census Pop. 2007	ASDR	Deaths 2006-2008	Census Pop. 2007	ASDR
< 1	771	12,089	.0213	422	6,247	.0225	349	5,842	.0199
1-4	239	43,352	.0018	121	22,558	.0018	118	20,794	.0019
5-9	97	51,271	.0006	54	26,721	.0007	43	24,550	.0006
10-14	91	49,367	.0006	56	25,438	.0007	35	23,929	.0005
15-19	142	46,074	.0010	84	23,703	.0012	58	22,371	.0009
20-24	171	44,550	.0013	101	22,727	.0015	70	21,823	.0011
25-29	186	39,163	.0016	106	19,486	.0018	80	19,677	.0014
30-34	211	35,107	.0020	108	17,593	.0021	103	17,514	.0020
35-39	287	30,708	.0031	147	15,400	.0032	140	15,308	.0031
40-44	437	29,744	.0049	233	14,988	.0052	204	14,756	.0046
45-49	691	25,126	.0092	373	13,033	.0095	318	12,093	.0088
50-54	866	19,594	.0147	505	10,005	.0168	361	9,589	.0126
55-59	1,050	15,622	.0224	585	8,022	.0243	465	7,600	.0204
60-64	1,186	12,463	.0317	660	6,336	.0347	526	6,127	.0286
65-69	1,219	9,192	.0442	650	4,555	.0476	569	4,637	.0409
70-74	1,121	5,713	.0654	573	2,737	.0698	548	2,976	.0614
75-79	949	3,418	.0926	498	1,595	.1041	451	1,823	.0825
80-84	640	1,861	.1146	294	779	.1258	346	1,082	.1066
85-89	466	893	.1740	196	370	.1766	270	523	.1721
90-94	131	276	.1582	42	108	.1296	89	168	.1766
95 +	82	156	.1752	21	75	.0933	61	81	.2510
Total	**11,031**	**475,739**	**.0077**	**5,830**	**242,476**	**.0080**	**5,201**	**233,263**	**.0074**

Source Derived from 2006-2008 NHIS data

Table VII-A3c: Central ASDR's for Indians by sex in census year 2007.

Age Group	Both Sexes			Males			Females		
	Deaths 2006-2008	Census Pop. 2007	ASDR	Deaths 2006-2008	Census Pop. 2007	ASDR	Deaths 2006-2008	Census Pop. 2007	ASDR
< 1	298	4,723	.0210	160	2,367	.0225	138	2,356	.0195
1-4	67	17,810	.0013	40	9,203	.0014	27	8,607	.0010
5-9	45	22,288	.0007	31	11,397	.0009	14	10,891	.0004
10-14	48	28,195	.0006	27	14,434	.0006	21	13,761	.0005
15-19	86	29,017	.0010	50	14,815	.0011	36	14,202	.0008
20-24	130	31,410	.0014	88	16,271	.0018	42	15,139	.0009
25-29	145	30,288	.0016	94	15,906	.0020	51	14,382	.0012
30-34	111	24,868	.0015	65	13,381	.0016	46	11,487	.0013
35-39	213	22,575	.0032	133	11,666	.0038	80	10,909	.0024
40-44	332	23,270	.0048	220	11,918	.0062	112	11,352	.0033
45-49	535	22,458	.0079	376	11,372	.0110	159	11,086	.0048
50-54	686	18,185	.0126	458	8,992	.0170	228	9,193	.0083
55-59	787	13,720	.0191	505	6,746	.0250	282	6,974	.0135
60-64	866	10,178	.0284	519	4,837	.0358	347	5,341	.0217
65-69	812	6,603	.0410	473	3,015	.0523	339	3,588	.0315
70-74	638	3,766	.0565	365	1,657	.0734	273	2,109	.0432
75-79	510	2,277	.0747	270	991	.0908	240	1,286	.0622
80-84	334	1,139	.0978	167	490	.1136	167	649	.0858
85-89	230	643	.1192	123	280	.1464	107	363	.0983
90-94	104	243	.1427	53	78	.2265	51	165	.1030
95 +	94	142	.2207	47	57	.2749	47	85	.1843
Total	**7,073**	**313,798**	**.0075**	**4,264**	**159,873**	**.0089**	**2,809**	**153,925**	**.0061**

Source Derived from 2006-2008 NHIS data

It appears that aggregation over a period of three years has indeed led to a smoother pattern of mortality for all the sub-populations. This is an indication that the quality of the NHIS data has probably improved compared to the 1980s and 1990s. After some further consistency tests it was decided a repetition of the complicated adjustment procedure carried out on previous occasions would lead to insignificant further improvement. The ASDRs in Table VII-A3a-c have therefore not further been adjusted and they have been used for the construction of the abridged lifetables for 2007. If, in future, the quality of the NHIS deteriorates again, further adjustment may be needed again.

The most remarkable feature of the data in TableVII-A3 is the very significant gap between the ASDRs for the Indian males and females. However, this is mainly the case for ages over 40. This gap is probably principally due to the much larger impact of lifestyle disease on adult Indian males than on adult Indian females. Furthermore a comparison with the 1986, 1997 and 2001 ASDRs shows that during the last two decades, the gap has widened.

TableVII-A4a: Abridged lifetable for total population 2007. Males

Age	m(x,n)	q(x,n)	l(x)	d(x,n)	L(x,n)	S(x,n)	T(x)	e(x)
0	0.02180	0.02138	100,000	2,138	98,084	0.97587	6,520,025	65.2
1	0.00170	0.00677	97,862	663	389,849	0.99429	6,421,941	65.6
5	0.00070	0.00349	97,199	340	485,146	0.99651	6,032,092	62.1
10	0.00070	0.00349	96,859	338	483,451	0.99548	5,546,946	57.3
15	0.00120	0.00598	96,521	578	481,267	0.99272	5,063,495	52.5
20	0.00170	0.00847	95,943	812	477,762	0.99092	4,582,228	47.8
25	0.00190	0.00946	95,131	900	473,425	0.99074	4,104,466	43.1
30	0.00190	0.00946	94,232	891	469,041	0.98712	3,631,041	38.5
35	0.00350	0.01736	93,341	1,620	462,999	0.97820	3,162,001	33.9
40	0.00550	0.02716	91,720	2,491	452,905	0.96236	2,699,002	29.4
45	0.01030	0.05031	89,229	4,489	435,859	0.93548	2,246,097	25.2
50	0.01660	0.07987	84,740	6,768	407,737	0.90410	1,810,238	21.4
55	0.02400	0.11347	77,971	8,847	368,634	0.86560	1,402,501	18.0
60	0.03430	0.15834	69,124	10,945	319,090	0.81431	1,033,867	15.0
65	0.04870	0.21750	58,179	12,654	259,839	0.74631	714,777	12.3
70	0.06950	0.29605	45,525	13,478	193,921	0.66018	454,938	10.0
75	0.09720	0.38829	32,048	12,444	128,023	0.58128	261,017	8.1
80	0.11990	0.45514	19,604	8,923	74,416	0.44045	132,994	6.8
85	0.16050	...	10,681	10,681	58,578	...	58,578	5.5

First entry of S(x,n) is for survivorship of 5 cohorts of birth to age group 0-4 = L(0,5) / 500000
Second entry of S(x,n) is for S(0,5) = L(5,5) / L(0,5)
Last entry of S(x,n) is S(80+,5) = T(85) / T(80)

TableVII-A4b: Abridged lifetable for total population 2007: Females

Age	m(x,n)	q(x,n)	l(x)	d(x,n)	L(x,n)	S(x,n)	T(x)	e(x)
0	0.01930	0.01897	100,000	1,897	98,306	0.97830	6,947,465	69.5
1	0.00160	0.00637	98,103	625	390,843	0.99515	6,849,159	69.8
5	0.00050	0.00250	97,477	243	486,778	0.99750	6,458,316	66.3
10	0.00050	0.00250	97,234	243	485,563	0.99687	5,971,538	61.4
15	0.00080	0.00399	96,991	387	484,043	0.99550	5,485,975	56.6
20	0.00100	0.00499	96,604	482	481,863	0.99431	5,001,932	51.8
25	0.00130	0.00648	96,122	623	479,120	0.99265	4,520,069	47.0
30	0.00170	0.00847	95,499	809	475,601	0.98902	4,040,949	42.3
35	0.00280	0.01391	94,691	1,317	470,381	0.98363	3,565,347	37.7
40	0.00390	0.01933	93,374	1,804	462,681	0.97401	3,094,966	33.1
45	0.00690	0.03396	91,569	3,110	450,657	0.95839	2,632,285	28.7
50	0.01030	0.05029	88,460	4,449	431,906	0.93562	2,181,628	24.7
55	0.01680	0.08081	84,011	6,789	404,099	0.90153	1,749,723	20.8
60	0.02500	0.11794	77,222	9,108	364,308	0.86015	1,345,623	17.4
65	0.03590	0.16516	68,114	11,250	313,359	0.80298	981,315	14.4
70	0.05280	0.23363	56,865	13,286	251,621	0.73070	667,956	11.7
75	0.07320	0.30883	43,579	13,459	183,859	0.65790	416,335	9.6
80	0.09550	0.38351	30,121	11,552	120,961	0.47968	232,476	7.7
85	0.13850	...	18,569	18,569	111,515	...	111,515	6.0

First entry of S(x,n) is for survivorship of 5 cohorts of birth to age group 0-4 = L(0,5) / 500000
Second entry of S(x,n) is for S(0,5) = L(5,5) / L(0,5)
Last entry of S(x,n) is S(80+,5) = T(85) / T(80)

TableVII-A4c: Abridged lifetable for Fijians 2007. Males

Age	m(x,n)	q(x,n)	l(x)	d(x,n)	L(x,n)	S(x,n)	T(x)	e(x)
0	0.02250	0.02206	100000	2206	98028	0.97503	6517686	65.2
1	0.00180	0.00717	97794	701	389485	0.99406	6419658	65.6
5	0.00070	0.00349	97093	339	484618	0.99651	6030173	62.1
10	0.00070	0.00349	96754	338	482925	0.99545	5545555	57.3
15	0.00120	0.00598	96416	577	480728	0.99321	5062629	52.5
20	0.00150	0.00747	95839	716	477463	0.99177	4581901	47.8
25	0.00180	0.00896	95123	852	473532	0.99067	4104438	43.1
30	0.00200	0.00995	94271	938	469116	0.98748	3630906	38.5
35	0.00320	0.01588	93332	1482	463241	0.97975	3161790	33.9
40	0.00520	0.02569	91850	2360	453859	0.96502	2698549	29.4
45	0.00950	0.04649	89490	4161	437982	0.93728	2244690	25.1
50	0.01680	0.08082	85329	6897	410512	0.90267	1806708	21.2
55	0.02430	0.11481	78432	9005	370556	0.86390	1396196	17.8
60	0.03470	0.16000	69428	11108	320122	0.81564	1025640	14.8
65	0.04760	0.21311	58320	12429	261104	0.74901	705518	12.1
70	0.06980	0.29746	45891	13651	195569	0.64897	444413	9.7
75	0.10410	0.40980	32240	13212	126919	0.56259	248844	7.7
80	0.12540	0.47056	19028	8954	71403	0.41437	121925	6.4
85	0.17660	...	10074	10074	50522	...	50522	5.0

First entry of S(x,n) is for survivorship of 5 cohorts of birth to age group 0-4 = L(0,5) / 500000
Second entry of S(x,n) is for S(0,5) = L(5,5) / L(0,5)
Last entry of S(x,n) is S(80+,5) = T(85) / T(80)

TableVII-A4d: Abridged lifetable for Fijians 2007. Females

Age	m(x,n)	q(x,n)	l(x)	d(x,n)	L(x,n)	S(x,n)	T(x)	e(x)
0	0.01990	0.01955	100000	1955	98257	0.97715	6740705	67.4
1	0.00190	0.00756	98045	742	390319	0.99429	6642448	67.7
5	0.00060	0.00300	97303	291	485787	0.99725	6252129	64.3
10	0.00050	0.00250	97012	242	484452	0.99665	5766342	59.4
15	0.00090	0.00449	96769	435	482831	0.99497	5281890	54.6
20	0.00110	0.00549	96335	528	480400	0.99384	4799059	49.8
25	0.00140	0.00698	95806	668	477442	0.99168	4318658	45.1
30	0.00200	0.00995	95138	947	473469	0.98778	3841216	40.4
35	0.00300	0.01490	94191	1403	467682	0.98168	3367747	35.8
40	0.00460	0.02276	92788	2112	459113	0.96784	2900065	31.3
45	0.00880	0.04312	90676	3910	444347	0.94846	2440951	26.9
50	0.01250	0.06072	86766	5268	421444	0.92229	1996604	23.0
55	0.02040	0.09730	81498	7929	388696	0.88522	1575160	19.3
60	0.02860	0.13376	73568	9841	344080	0.84247	1186464	16.1
65	0.04090	0.18604	63728	11856	289875	0.77642	842384	13.2
70	0.06140	0.26641	51872	13819	225064	0.69814	552509	10.7
75	0.08250	0.34066	38053	12963	157126	0.62635	327445	8.6
80	0.10690	0.41932	25090	10521	98416	0.42216	170318	6.8
85	0.17210	...	14569	14569	71902	...	71902	4.9

First entry of S(x,n) is for survivorship of 5 cohorts of birth to age group 0-4 = L(0,5) / 500000
Second entry of S(x,n) is for S(0,5) = L(5,5) / L(0,5)
Last entry of S(x,n) is S(80+,5) = T(85) / T(80)

TableVII-A4e: Abridged lifetable for Indians 2007. Males

Age	m(x,n)	q(x,n)	l(x)	d(x,n)	L(x,n)	S(x,n)	T(x)	e(x)
0	0.02250	0.02206	100,000	2,206	98,028	0.97578	6,485,196	64.9
1	0.00140	0.00558	97,794	546	389,860	0.99439	6,387,169	65.3
5	0.00090	0.00449	97,249	437	485,151	0.99626	5,997,308	61.7
10	0.00060	0.00300	96,812	290	483,335	0.99601	5,512,157	56.9
15	0.00110	0.00549	96,522	530	481,406	0.99275	5,028,822	52.1
20	0.00180	0.00896	95,992	860	477,915	0.99027	4,547,417	47.4
25	0.00200	0.00995	95,132	947	473,267	0.99130	4,069,501	42.8
30	0.00160	0.00797	94,186	751	469,149	0.98744	3,596,234	38.2
35	0.00380	0.01884	93,435	1,760	463,257	0.97560	3,127,085	33.5
40	0.00620	0.03057	91,675	2,802	451,952	0.95881	2,663,828	29.1
45	0.01100	0.05364	88,872	4,767	433,338	0.93294	2,211,876	24.9
50	0.01700	0.08172	84,106	6,873	404,279	0.90119	1,778,538	21.1
55	0.02500	0.11793	77,233	9,108	364,333	0.86036	1,374,259	17.8
60	0.03580	0.16472	68,125	11,222	313,458	0.80422	1,009,926	14.8
65	0.05230	0.23170	56,903	13,184	252,089	0.73096	696,468	12.2
70	0.07340	0.30937	43,719	13,525	184,266	0.66290	444,379	10.2
75	0.09080	0.36734	30,193	11,091	122,150	0.60167	260,113	8.6
80	0.11360	0.43706	19,102	8,349	73,494	0.46729	137,962	7.2
85	0.14640	...	10,753	10,753	64,468	...	64,468	6.0

First entry of S(x,n) is for survivorship of 5 cohorts of birth to age group 0-4 = L(0,5) / 500000
Second entry of S(x,n) is for S(0,5) = L(5,5) / L(0,5)
Last entry of S(x,n) is S(80+,5) = T(85) / T(80)

TableVII-A4f: Abridged lifetable for Indians 2007. Females

Age	m(x,n)	q(x,n)	l(x)	d(x,n)	L(x,n)	S(x,n)	T(x)	e(x)
0	0.01950	0.01917	100,000	1,917	98,289	0.97928	7218959	72.2
1	0.00100	0.00399	98,083	391	391,352	0.99659	7120669	72.6
5	0.00040	0.00200	97,692	195	487,972	0.99775	6729317	68.9
10	0.00050	0.00250	97,497	243	486,875	0.99685	6241345	64.0
15	0.00080	0.00399	97,253	388	485,343	0.99574	5754470	59.2
20	0.00090	0.00449	96,865	435	483,274	0.99478	5269126	54.4
25	0.00120	0.00598	96,430	577	480,751	0.99386	4785852	49.6
30	0.00130	0.00648	95,853	621	477,801	0.99107	4305101	44.9
35	0.00240	0.01193	95,232	1,136	473,534	0.98586	3827300	40.2
40	0.00330	0.01637	94,096	1,541	466,839	0.98039	3353765	35.6
45	0.00480	0.02374	92,555	2,197	457,683	0.96862	2886927	31.2
50	0.00830	0.04072	90,358	3,680	443,321	0.94782	2429244	26.9
55	0.01350	0.06544	86,679	5,673	420,188	0.91680	1985922	22.9
60	0.02170	0.10320	81,006	8,359	385,229	0.87605	1565735	19.3
65	0.03150	0.14633	72,647	10,631	337,479	0.83112	1180505	16.2
70	0.04310	0.19493	62,016	12,089	280,486	0.77081	843026	13.6
75	0.06220	0.26935	49,927	13,448	216,202	0.69057	562541	11.3
80	0.08580	0.35116	36,479	12,810	149,303	0.56891	346338	9.5
85	0.09830	...	23,669	23,669	197,036	...	197036	8.3

First entry of S(x,n) is for survivorship of 5 cohorts of birth to age group 0-4 = L(0,5) / 500000
Second entry of S(x,n) is for S(0,5) = L(5,5) / L(0,5)
Last entry of S(x,n) is S(80+,5) = T(85) / T(80)

The abridged lifetables for the total population and for Fijians and Indians by sex are presented in Table VII-A4a-f. They have been constructed in the conventional manner, using the MORTPAK programme LIFTB. Firstly, the ASDRs have been converted into lifetable risks (or probabilities) ${}_nq_x$. These ${}_nq_x$ values represent the core of the lifetable. All other lifetable functions have been derived from this central function.

Lifetables for the rural and urban sector are not included in this section. Unfortunately, it is not yet possible to construct these sectoral lifetables from NHIS data since the description of the usual place of residence of the deceased on the death certificates is in many cases not precise enough to establish whether this was a rural or an urban death. In the meantime, rural and urban lifetables derived from census data have been constructed since the 1986 census.

Similarly, it is not yet possible to construct provincial lifetables from NHIS data. Since it is much easier to derive the correct province of usual residence of deceased persons from the death certificates than the geographic sector in which deceased persons were residing, it may be expected that provincial lifetables from NHIS data will be produced in the foreseeable future. However, in order to diminish the impact of chance fluctuations due to small numbers of deaths, the data for the provinces should be aggregated over a large number of years, especially for the provinces with a relatively small population: those in the Eastern Division as well as Namosi and Bua.

Table VI-A5 summarizes some of the key indices of the above lifetables.

Table VII-A5: Key indices of mortality based on NHIS data for the population by sex and ethnicity in 2007

Index	Total Population			Fijians			Indians		
	P	M	F	P	M	F	P	M	F
${}_1q_0$ (‰)	20	21	19	21	22	20	21	23	19
${}_4q_1$ (‰)	7	7	6	8	7	8	5	6	4
e_0 (yrs)	67.4	65.2	69.5	66.3	65.2	67.4	68.6	64.9	72.2
e_{25} (yrs)	45.1	43.1	47.0	44.1	43.1	45.1	46.2	42.8	49.6
e_{55} (yrs)	19.4	18.0	20.8	18.6	17.8	19.3	20.4	17.8	22.9
e_{65} (yrs)	13.4	12.3	14.4	12.7	12.1	13.2	14.2	12.2	16.2

Source All indices have been estimated from data on death by age, sex and ethnicity recorded by the NHIS between 2006 and 2008

4. Evaluation of the results

The mortality indices calculated from NHIS data in Section 3 are reasonably consistent with those derived indirectly from the 1986 and 1996 censuses.[18] However, the two approaches do not lead to entirely identical results. For instance, in 1996, some key indices of early childhood mortality based on NHIS data suggest a significantly higher level of early childhood mortality than those derived from the census. On the other hand, the 1996 Census suggests somewhat higher mortality for adults. A more detailed comparison of mortality parameters derived from recent NHIS data with those indirectly estimated from 2007 Census data can be found in Part C.

[18] The mortality parameters estimated indirectly from previous censuses can be found in the Analytical Reports of the censuses.

PART B

INDIRECT ESTIMATION OF MORTALITY INDICES FROM CENSUS DATA

Censuses are usually not designed to collect flow statistics (e.g. on mortality, fertility and migration) over a period of time. Furthermore, in countries with a complete and accurate registration system of vital events there is no need to collect this information by means of the interview method in a census (or survey).

In Part A, it was shown that Fiji's CRS has never been able to provide complete and reliable information on vital events.[19] In the absence of this information, all censuses since 1946 have included a number of retrospective questions from which mortality (and fertility) can be estimated indirectly. However, in Part A, it was also shown that, since the 1980s, it became increasingly more obvious that, contrary to the official death registration of the CRS, the level of completeness and accuracy of death registration data collected by NHIS is improving. For reasons already mentioned, the FBoS continued to include these retrospective questions in its censuses.

From the outset, it must be stressed that, compared to the direct calculation of mortality (and fertility) indices from registration data, the indirect approach of estimating these indices from censuses (as well as surveys) has several weaknesses. The most important ones include:

- The retrospective data collected in a census is affected by several forms of bias that are not found on death registration data. It is often not possible to adjust the data adequately for these forms of bias.

- The methodology used in the indirect estimation of mortality has a number of ideal conditions that are seldom entirely met.

- The methodology used in the indirect estimation of mortality is complex compared to the direct estimation of mortality from registration data. Relatively few people are familiar with the indirect methodology.

- The census-based mortality estimates can only be obtained whenever a census (or demographic survey) has been conducted. In Fiji, censuses are conducted at an interval of ten years. Furthermore, Fiji has never conducted a Demographic Survey or Demographic and Health Survey (DHS).[20]

- Last but not least, the indirect measurement of mortality data from retrospective census data is time consuming and costly.

In conclusion, the indirect approach towards mortality estimation is far from ideal. In Fiji, this approach has always been considered as a temporary solution, to be abandoned as soon as the data from the CRS would reach an acceptable level of completeness and accuracy.

The results of the indirect analysis of mortality data derived from all censuses since 1976 has been published and discussed in the Analytical Reports of these censuses. Census Reports prior to the 1976 Census did not include a systematic analysis of mortality (and fertility).[21]

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[19] During the preparation phase of all censuses since 1946, the level of completeness and accuracy of death (and birth) statistics was assessed. All these pre-census assessments, including the one carried out prior to the most recent census in 2007, concluded that Fiji's CRS remains very incomplete and deficient. The census management team had no other option than to continue with the far from ideal procedure of estimating mortality (and fertility) indirectly from census data.

[20] However, Fiji participated in the World Fertility Survey, carried out in the 1970s. The pilot test of this survey was carried out in Fiji in 1974. There are no plans to conduct a DHS in the near future.

[21] Some results of the indirect estimation of mortality data from the 1946, 1956 and 1966 Censuses have been summarized in Bakker, 2011b, Appendix A., .

The indirect analysis of mortality (and fertility) from census (survey) data is based on the response to a number of retrospective questions included in these censuses (surveys). Some of these questions have been designed to estimate infant and child mortality and others to estimate adult mortality.

- Section 1 focuses on the estimates of early childhood mortality parameters obtained indirectly from lifetime fertility data collected during recent censuses.

- Section 2 is concerned with the estimates of adult mortality for females and males obtained from maternal and paternal orphanhood data collected in recent censuses.

- Section 3 generates male and female two-parameter logit lifetables by splicing together the early childhood mortality estimates (by sex) obtained in Section 1 and the male and female adult mortality estimates obtained in Section 2.

As mentioned, the techniques used in the indirect estimation of childhood mortality from lifetime fertility data and adult mortality from orphanhood data collected in a census or survey are not explained in this chapter. This has been done in a forthcoming FBoS monograph on mortality.[22] Furthermore, applications of most of the indirect techniques applied in census analysis in Fiji since 1946 have conveniently been summarized in United Nations Manual X.[23]

1. Early childhood mortality

In this section, reference is made to the infant mortality rate (IMR), the child mortality rate (CMR) and the under-five mortality rate (U5MR). Infant mortality is defined as the probability (or risk) of dying in the first year of life. In a lifetable, this probability is denoted ${}_1q_0$ or alternatively q(1). Child mortality refers to the probability of dying during the four year period from age 1 to age 4, or in lifetable terms ${}_4q_1$. Finally, the under-five mortality rate (U5MR) refers to the probability of dying during the first five years of life.[24]

1.1 Basic data and its restrictions

During all censuses in Fiji since 1946, women 15 years old and over have been asked a number of so-called lifetime fertility questions. These questions are concerned with the total number of children ever been born to these women and how many of these children survived or had died. Table VII-B1 presents an overview of the phrasing of the lifetime fertility questions that have been included on the census interview schedules since 1946.The answers to the above questions are recorded separately for male and female children. In the basic census tabulations in Fiji, this lifetime fertility information is tabulated by age of mother (in five-year age groups).[25] In the most recent census in 2007 (as well as in 1996) "Not Stated" cases have been imputed.

Ideally, questions should be asked of all women aged 15 and over. In practice, this is not always possible. For instance, during censuses in Fiji, lifetime fertility questions have not been asked of women residing in non-private dwellings (NPD). This includes women who are at the time of the census, patients in a health institution, inmates in a prison and other institutionalized women.[26]

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[22] Bakker, 2013 (forthcoming)
[23] United Nations, 1983
[24] In this chapter, the U5MR has been defined in lifetable terms as l_5/l_0
[25] In some countries, lifetime fertility information is tabulated, not by age of mother but by duration of marriage.
[26] In 2007, for all persons in NPDs only basic information was collected on a Short Form. This is the information recorded by the institution i.e. date of birth, sex, marital status, religion, usual place of residence etc.

Table VII-B1: Lifetime fertility questions included on the interview schedules of censuses in Fiji since 1946

Year	Question Nr	Questions
1946	**6**	If a married woman, state total number of children born alive to her [whether listed on this schedule or not] and the number of such children who are now dead. If not a married woman write NA. • Total born • Now dead
1956	**5**	For Females aged 15 years or older: • Total number of children living • Total number of children dead
1966	**5**	For Females aged 15 years or older: • Total number of children born • Total number of children still living
1976	**17 and 18**	For all women born in 1962 or before: • How many children has the woman borne alive? • How many of the children she has borne are still alive? NB: Tabulated separately for boys and girls. If none, 0 is entered.
1986	**18, 19 and 20**	For all women born in 1971 or before: • How many of the children this woman has borne alive where here on census night? If none, 0. • How many were elsewhere? If none, 0. • How many have died? If none, 0 NB: Tabulated separately for boys and girls.
1996	**F1, 2 and 3**	For all women born in 1981 or before: • How many of the children this woman has borne alive were here on census night? If none, 0. • How many have died? If none, 0.
2007		For all women born in 1992 or before: F1: How many live born children of each sex, did this female give birth to that are still alive and were staying here on census night a. In this household. (If none, write 0) b. Elsewhere (in Fiji or overseas). (If none, write 0) F2: How many live born children of each sex this female has given birth to have died? (If none, write 0) F3: How many live born children of each sex have in total been born to this female? (If none, write 0)

As already emphasized on several occasions in this Analytical Report, during a census, one person often provides information for all household members. This respondent tends to be the head of household or his/her spouse or another senior member of the household. Reporting by these proxy-respondents has very significant implications for data quality. In particular, proxy respondents cannot be considered as the ideal persons to provide information on lifetime fertility of other

household members, especially when the proxy respondent is not a close relative or a younger person reporting on the lifetime fertility experience of older persons.

From the above, it follows that it may be expected that the quality of lifetime fertility data collected in a specialized (sample) survey, i.e. a Demographic and Health Survey (DHS), is of better quality than that collected in a census. In a survey, all answers are provided by the women who have undergone the events and not by proxy-respondents. Moreover, the interviewers in a survey usually have specialized knowledge of the subject matter of the survey. For instance, the interviewers in a DHS tend to be nurses.

Furthermore, a detailed understanding of the errors that often affect the lifetime fertility data will undoubtedly lead to a more meaningful interpretation of the results of the analysis. The most important types of error are briefly discussed below.

- Recall (memory) lapse

  This is probably the most important form of bias that usually affects lifetime fertility data. It refers to the fact that, with increasing age of women, the retrospective reports concerning their lifetime fertility are usually increasingly affected by underreporting. The reasons for this are obvious:

  - Older women are asked to remember and report vital events that occurred a long time ago. For instance, a female respondent aged 90 years may have given birth to a child some 75 years ago.

  - Older women are on average less educated than the younger ones.

  An assessment of the answers to the lifetime fertility questions during the early censuses in 1946, 1956 and 1966, suggests that recall (memory) lapse was serious. The data from the more recent censuses indicates that recall lapse in this data has become less pronounced. However, it remains a significant problem. It is likely that the improvement of the quality of the lifetime fertility data in subsequent censuses is, at least partially due to improvement in the level of education and literacy of women.

  Children which tend to be omitted from lifetime fertility reports belong to several categories.

  i. Live born children who died in infancy

     In many cases, these children die during the first seconds or minutes after birth. Consequently, these children have hardly left a mark in society and some societies do not even recognize that these children 'existed' at all particularly if they have not been given a name. The latter is not the case in Fiji. Nevertheless, mothers in Fiji often omit dead children from their lifetime fertility reports. The consequence of this type of error for early childhood mortality estimation can be quite serious.

  ii. Children not living in the same household as their mother.

     This applies for instance to older children who are going to boarding school. This category also includes children who got married or left home for another reason. In censuses since 1986, an effort has been made to reduce this form of bias by asking specifically for children who lived elsewhere.

iii. Illegitimate children

These children also tend to be underrepresented in lifetime fertility reports. It is often far from easy to collect information on illegitimate children in Fiji. Many children who would be considered as illegitimate in other societies would probably not be considered and certainly not be reported as illegitimate children during a census in Fiji. In most cases, these children have been adopted and their foster parents tend to report these children as their own (natural) children. If this happens, they will be included in the lifetime fertility data but the information about their mother will be incorrect.

- Adoption bias

Female respondents should only report their own or natural children. If a woman had a child that has been adopted by somebody else, she still should report this child since it is her natural child. On the other hand, if she herself has adopted a child, she should not report this child. Its natural mother should report it. If the natural and the foster mother have the same demographic and socio-economic characteristics (age, socio-economic status, religion, education etc.), substitution of the foster mother for the natural mother will not cause any bias in the data. However, this is rarely the case, especially in Fiji. In reality, the foster mother is often a woman who is significantly older than the natural mother. In many cases, the foster mother is the child's grandmother or an aunt. Consequently, the adoption bias tends to move the age-specific fertility pattern up the age scale. Information from censuses and surveys in the South Pacific Region, including Fiji suggest that the adoption bias in the lifetime fertility data can be very significant.

Adoption may lead to some double count of the number of children ever born. This occurs when a foster mother as well as the natural mother reports the same child.

- Confusion between live born and still-born children

During censuses in Fiji, the criterion for being live born is that, immediately after birth, the child cried or gave any other sign of life. The definition (formulated by the WHO) of a live birth is far more precise and complicated.[27] It cannot reasonably be expected that, in borderline cases, laypersons (and this includes most census enumerators) will be able to distinguish between a live and a stillborn child, the more so since their judgment has to be based on retrospective reports of women.[28] It is therefore doubtful whether it is possible that this kind of bias can be avoided altogether, particularly during a census.

It is of course also possible that stillborn children are erroneously included in the reports of children born alive and now dead. It will be noted that during the training of census field staff it is stressed that the lifetime fertility questions refer to live born children. There is no evidence that this form of bias is very significant in Fiji.

[27] The WHO definition of live birth is "the complete expulsion or extraction from its mother of a product of conception, irrespective of the duration of pregnancy, which, after such separation, breathes or shows any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles, whether or not the umbilical cord has been cut or the placenta is attached; each product of such a birth is considered live-born."

[28] It needs to be reiterated that, in a census (or survey), women do not report on the vital status of a new born child immediately after the child is born. In the case of very old women, the births they report may have occurred more than 60 years ago. Furthermore, the respondent is in many cases not the natural mother herself or even a foster mother but a proxy respondent.

On balance, it may reasonably be expected that it is more likely that women will omit dead children than surviving children from their lifetime fertility reports. Once again, this form of bias will almost certainly be more significant in a census than in a survey. Since in censuses in the Pacific, including Fiji, there is often some evidence that more dead than surviving children have been omitted from the lifetime fertility reports, it must be assumed that the estimation of infant and child mortality rates from retrospective data collected during a census will result in minimum estimates of early childhood mortality.

- Omission of lifetime fertility reports of never married women

The lifetime fertility questions should be asked of all women aged 15 and over, irrespective of their marital status. However, it will be realized that some enumerators may feel embarrassed to ask these sensitive questions of young unmarried women particularly when the enumerator is a (young) male.[29]

- Non-response

During most censuses, some women will, for one reason or another, refuse to answer the sensitive lifetime fertility questions. In Census Reports in Fiji in the past, non-response was shown in the basic tables. Nowadays, missing information is imputed. From censuses in the South Pacific, it is known that the level of imputation with regard to the lifetime fertility questions is sometimes quite high. Although, the level of imputation of this information in Fiji tends to be reasonable, imputation nevertheless remains a matter of concern.

It is not clear to what extent imputation of lifetime fertility data affects the infant and child mortality (as well as lifetime fertility) estimates derived from this data. With a properly designed and executed edit programme, imputation should not introduce a significant bias in the estimates. If it may be assumed that women who provided the required information have, on average, the same demographic and socio-economic characteristics than those whose lifetime fertility records are missing, imputation may not introduce a significant bias in the estimates since the imputation process distributes the not stated cases using information for the stated cases. It is, however by no means certain that the above assumption is always correct. For instance, during the 2007 Census field operation in Fiji, most women without a fixed abode (i.e. those sleeping in the parks, doorways and other places in the major urban centers), refused to provide sensitive information, including lifetime fertility information. These women can certainly not be considered as a cross-section of females in Fiji society.

- "Zero-error"

When recording the Not Stated cases or the answers of childless (zero-parity) women to the lifetime fertility questions, enumerators sometimes make ambiguous entries (for instance a dash: -) or leave an empty space. For zero-parity cases, the correct entry is 0. When this mistake is not corrected in the field, the editors and data entry personnel at the census headquarters consider these cases as Not Stated, whereas a certain proportion of these cases are in reality 0-parity cases. If this so-called "zero-error" is made in a significant number of cases, the lifetime fertility data will be compromised. In censuses before 1996, the so-called "zero-error" could sometimes be estimated and corrections could be made.[30] More recently,

[29] It will be noted that in the 1946 Census the lifetime fertility questions were asked of all married women. This clearly is very unsatisfactory.

[30] Given certain conditions, zero error in lifetime fertility data can be corrected using the El-Badry method.

since the start of the "imputation age", all these cases have been imputed and it is not possible anymore to estimate the extent of "zero-error".

Finally, something needs to be said about possible errors in the response to the census question regarding the vital status of last born child.[31] From this information, the level of infant mortality can be directly estimated. During the 1986 Census analysis, this direct estimate of infant mortality was considered as quite low. However, in 1996, the direct estimate was fairly consistent with the indirect estimates. A direct estimate will once again be made from 2007 Census data.

1.2 Methodology

Since the 1950s, a number of techniques have been developed for the indirect estimation of infant and child mortality from lifetime fertility data collected in censuses and surveys.[32] These techniques have been applied to lifetime fertility data collected in all censuses since 1946. Furthermore, recent censuses in Fiji also included a question on the vital status of the last born child. From this information, infant mortality has been calculated directly. As mentioned, a complete documentation of these techniques can be found in a forthcoming FBoS Research Monograph on mortality.

Step 1: Computation of P_i and S_i.

The first step in the analysis concerns the computation of the average number of children ever born (P_i) and the average number of children surviving (S_i) by age of mother. These parameters are estimated from the census data concerning the number of children ever born (CEB) and the number of children surviving (CS) by age of mother.[33]

Step 2: Computation of D_i

From the P_i and S_i values, the proportion of children dead (D_i) by age of mother is calculated:[34]

$$\mathbf{D_i = 1 - S_i/P_i}$$

The D_i values, or the proportion of children ever born that have died, provide some rather vague indication of early childhood mortality. These D_i values are not conventional indices of early childhood mortality.

Step 3: Conversion of D_i values into lifetable probabilities

The vague indices of early childhood mortality (D_i) have been converted into precise lifetable probabilities (risks) of dying between birth and age x, q(x) or ${}_xq_0$.

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[31] This question was included in the 1986, 1996 and 2007 Censuses in Fiji.On the questionnaires of the 1986, 1996 and 2007 Censuses, women aged 15 and over were asked to report the date of birth of their last-born child and the vital status of this child.

[32] Lifetime fertility information is not only used for the indirect estimation of infant and child mortality. It is also used to measure cohort or longitudinal fertility. This is discussed in Chapter VIII.

[33] The suffix i refer to the age of mothers. If i = 1, the above proportions refer to women aged 15 – 19. If i = 2, they refer to women aged 20 – 24 etc.

[34] D_i can also directly be calculated from (CEB-CS) / CEB for i = 1, 2……7.

1.3 Estimation of q(x) values from 2007 Census lifetime fertility data

The average numbers of children ever born by sex (P_i) and the average number of children surviving by sex (S_i), derived from 2007 Census lifetime fertility data of women 15-49 in five-year age groups by sex, ethnicity and geographic sector are shown in Table VII-B2a-c. Moreover, Table VII-B3 presents the P_i and S_i values by sex of child (for i = 1 to 7) at the provincial level.

Table VII-B2a: P_i, S_i and D_i values by sex and geographic sector derived from 2007 Census lifetime fertility data for the total population

i	All children			Male children			Female children		
	P_i	S_i	D_i	P_i	S_i	D_i	P_i	S_i	D_i
All Sectors									
1	0.121	0.115	.049	0.055	0.052	.051	0.067	0.064	.047
2	0.756	0.728	.038	0.374	0.360	.039	0.382	0.368	.036
3	1.584	1.541	.027	0.812	0.789	.029	0.771	0.753	.025
4	2.381	2.325	.023	1.229	1.199	.025	1.152	1.127	.022
5	1.879	2.807	.025	1.482	1.443	.027	1.397	1.365	.023
6	3.207	3.116	.029	1.657	1.605	.031	1.551	1.511	.026
7	3.358	3.247	.033	1.743	1.679	.037	1.616	1.568	.029
Rural Sector									
1	0.136	0.131	.038	.063	0.060	.040	0.074	0.071	.037
2	0.943	0.910	.035	.035	0.452	.038	0.473	0.458	.031
3	1.863	1.814	.026	.026	0.924	.030	0.910	0.890	.023
4	2.649	2.581	.026	.026	1.328	.028	1.283	1.253	.023
5	3.174	3.089	.027	.027	1.580	.031	1.544	1.509	.023
6	3.493	3.33	.031	.031	1.751	0.35	1.679	1.633	.028
7	3.627	3.494	0.37	.037	1.807	.040	1.743	1.687	.032
Urban Sector									
1	0.109	0.103	.059	0.048	0.045	.063	0.061	0.058	.056
2	0.625	0.600	.041	0.307	0.295	.040	0.318	0.305	.041
3	1.369	1.332	.027	0.705	0.685	.028	0.665	0.647	.027
4	2.153	2.107	.021	1.112	1.089	.021	1.041	1.019	.021
5	2.613	2.553	.023	1.349	1.319	.022	1.265	1.235	.024
6	2.933	2.858	.025	1.505	1.464	.027	1.428	1.394	.023
7	3.112	3.020	.030	1.614	1.561	.033	1.498	1.459	.026

Table VII-B2b: P_i, S_i and D_i values by sex and geographic sector derived from 2007 Census lifetime fertility data for Fijians

I	All children			Male children			Female children		
	Pi	Si	Di	Pi	Si	Di	Pi	Si	Di
All Sectors									
1	0.121	0.116	.047	0.058	0.055	.045	0.064	0.061	.048
2	0.807	0.776	.038	0.400	0.384	.041	0.406	0.392	.035
3	1.698	1.653	.026	0.871	0.845	.030	0.827	0.808	.023
4	2.546	2.486	.023	1.313	1.280	.025	1.233	1.206	.022
5	3.137	3.060	.025	1.612	1.568	.027	1.525	1.492	.022
6	3.521	3.424	.028	1.825	1.769	.031	1.696	1.655	.024
7	3.713	3.589	.034	1.924	1.851	.038	1.790	1.738	.029
Rural Sector									
1	0.145	0.140	.035	0.069	0.067	.039	0.075	0.073	.031
2	0.985	0.950	.036	0.495	0.474	.041	0.491	0.476	.031
3	1.911	1.863	.025	0.988	0.961	.028	0.923	0.902	.022
4	2.764	2.693	.026	1.426	1.386	.028	1.338	1.307	.023
5	3.388	3.299	.026	1.739	1.686	.030	1.649	1.613	.022
6	3.771	3.661	.029	1.963	1.900	.032	1.808	1.760	.027
7	3.912	3.764	.038	2.035	1.950	.042	1.877	1.814	.033
Urban Sector									
1	0.102	0.095	.061	0.048	0.045	.052	0.054	0.050	.069
2	0.656	0.630	.039	0.321	0.308	.040	0.335	0.322	.039
3	1.483	1.441	.028	0.753	0.728	.033	0.731	0.713	.024
4	2.308	2.261	.021	1.190	1.165	.021	1.118	1.096	.020
5	2.856	2.792	.022	1.469	1.435	.023	1.387	1.357	.022
6	3.219	3.138	.025	1.658	1.611	.029	1.561	1.528	.021
7	3.475	3.377	.028	1.790	1.730	.033	1.685	1.647	0.22

Table VII-B2c: P_i, S_i and D_i values by sex and geographic sector derived from 2007 Census lifetime fertility data for Indians

I	All children			Male children			Female children		
	Pi	Si	Di	Pi	Si	Di	Pi	Si	Di
All Sectors									
1	0.124	0.118	.048	0.051	0.048	.058	0.073	0.069	.042
2	0.694	0.669	.037	0.341	0.329	.036	0.353	0.340	.037
3	1.458	1.419	.027	0.746	0.726	.027	0.712	0.693	.027
4	2.148	2.098	.023	1.106	1.080	.024	1.043	1.018	.022
5	2.542	2.478	.025	1.305	1.271	.036	1.237	1.207	.025
6	2.818	2.734	.030	1.456	1.409	.033	1.362	1.325	.027
7	2.995	2.898	.033	1.557	1.502	.035	1.439	1.396	.030
Rural Sector									
1	0.124	0.118	.046	0.052	0.050	.042	0.072	0.069	.049
2	0.865	0.838	.032	0.425	0.411	.032	0.441	0.427	.032
3	1.772	1.721	.029	0.887	0.857	.034	0.884	0.864	.023
4	2.393	2.333	.025	1.229	1.196	.027	1.164	1.138	.023
5	2.799	2.723	.027	1.431	1.387	.030	1.369	1.336	.024
6	3.048	2.944	.034	1.578	1.517	.039	1.470	1.427	.029
7	3.233	3.127	.033	1.671	1.609	.037	1.562	1.518	.029
Urban Sector									
1	0.124	0.117	.050	0.051	0.047	.071	0.073	0.070	.036
2	0.590	0.566	.041	0.291	0.279	.040	0.299	0.287	.041
3	1.269	1.237	.026	0.661	0.647	.021	0.608	0.590	.030
4	1.984	1.941	.022	1.025	1.002	.022	0.960	0.939	.022
5	2.394	2.289	.023	1.207	1.181	.022	1.136	1.108	.025
6	2.628	2.559	.026	1.355	1.319	.027	1.272	1.240	.025
7	2.815	2.724	.032	1.470	1.422	.033	1.345	1.303	.031

Table VII-B3: P_i and S_i values by sex at the provincial level derived from 2007 Census lifetime fertility data

Province	Sex	i=1		i=2		i=3		i=4		i=5		i=6		i=7	
		P_i	S_i	P_i	S_i	P_i	S_i	P_i	S_i	P_i	S_i	P_i	S_i	P_i	S_i
Fiji	**P**	**0.121**	**0.115**	**0.756**	**0.728**	**1.584**	**1.541**	**2.381**	**2.325**	**2.879**	**2.807**	**3.207**	**3.116**	**3.358**	**3.247**
	M	**0.055**	**0.052**	**0.374**	**0.360**	**0.812**	**0.789**	**1.229**	**1.199**	**1.482**	**1.443**	**1.657**	**1.605**	**1.743**	**1.679**
	F	**0.067**	**0.064**	**0.382**	**0.368**	**0.771**	**0.753**	**1.152**	**1.127**	**1.397**	**1.365**	**1.551**	**1.511**	**1.616**	**1.568**
Provinces of the Western Division															
Ba	**P**	0.171	0.164	0.798	0.768	1.608	1.561	2.344	2.285	2.775	2.701	3.043	2.955	3.226	3.124
	M	0.060	0.056	0.390	0.374	0.827	0.801	1.207	1.180	1.419	1.381	1.564	1.516	1.651	1.594
	F	0.111	0.107	0.408	0.395	0.781	0.760	1.136	1.105	1.356	1.319	1.479	1.439	1.575	1.530
Nadroga	**P**	0.145	0.139	0.861	0.826	1.576	1.539	2.350	2.301	2.777	2.705	3.227	3.118	3.285	3.169
	M	0.076	0.072	0.425	0.407	0.791	0.774	1.238	1.204	1.421	1.374	1.693	1.624	1.750	1.682
	F	0.070	0.665	0.436	0.419	0.785	0.765	1.112	1.097	1.356	1.332	1.534	1.494	1.535	1.486
Ra	**P**	0.106	0.103	0.815	0.784	1.811	1.754	2.623	2.563	3.216	3.137	3.510	3.404	3.721	3.576
	M	0.053	0.052	0.426	0.405	0.902	0.867	1.386	1.350	1.626	1.576	1.827	1.768	1.968	1.893
	F	0.053	0.051	0.389	0.379	0.909	0.887	1.237	1.213	1.590	1.561	1.683	1.635	1.752	1.683
Provinces of the Central Division															
Naitasiri	**P**	0.077	0.072	0.625	0.601	1.415	1.380	2.197	2.156	2.706	2.645	3.088	3.003	3.255	3.159
	M	0.038	0.035	0.310	0.298	0.726	0.707	1.126	1.103	1.387	1.353	1.612	1.564	1.680	1.622
	F	0.040	0.037	0.316	0.302	0.690	0.673	1.071	1.053	1.320	1.292	1.476	1.439	1.575	1.536
Rewa	**P**	0.088	0.082	0.553	0.525	1.237	1.206	2.049	2.002	2.574	2.521	2.899	2.834	3.045	2.968
	M	0.047	0.044	0.274	0.259	0.619	0.602	1.060	1.032	1.316	1.288	0.433	1.397	1.573	1.528
	F	0.041	0.038	0.280	0.265	0.618	0.605	0.989	0.970	1.258	1.233	2.466	1.437	1.472	1.440
Tailevu	**P**	0.126	0.121	0.777	0.755	1.721	1.675	2.545	2.490	3.109	3.022	3.268	3.185	3.580	3.439
	M	0.062	0.061	0.380	0.371	0.923	0.892	1.350	1.317	1.625	1.579	1.677	1.632	1.918	1.839
	F	0.064	0.061	0.397	0.384	0.798	0.782	1.195	1.173	1.484	1.443	1.592	1.554	1.662	1.600
Namosi	**P**	0.107	0.103	0.901	0.891	1.802	1.781	2.754	2.689	3.486	3.432	4.030	3.867	4.024	3.799
	M	0.056	0.052	0.435	0.429	0.912	0.898	1.415	1.365	1.827	1.800	2.099	2.025	1.965	1.834
	F	0.052	0.052	0.466	0.463	0.891	0.883	1.339	1.323	1.659	1.632	1.931	1.842	2.059	1.965

Province	Sex	i=1		i=2		i=3		i=4		i=5		i=6		i=7	
		P_i	S_i	P_i	S_i	P_i	S_i	P_i	S_i	P_i	S_i	P_i	S_i	P_i	S_i
Serua	**P**	0.160	0.156	0.805	0.793	1.769	1.716	2.532	2.448	3.004	2.915	3.480	3.390	3.637	3.502
	M	0.096	0.095	0.412	0.404	0.900	0.873	1.301	1.259	1.551	1.506	1.838	1.785	1.929	1.859
	F	0.064	0.062	0.393	0.389	0.869	0.843	1.231	1.189	1.452	1.409	1.642	1.605	1.708	1.643
Provinces of the Northern Division															
Bua	**P**	0.228	0.224	1.148	1.074	1.994	1.943	2.899	2.825	3.522	3.429	3.736	3.638	4.099	3.952
	M	0.120	0.118	0.598	0.567	1.055	1.026	1.533	1.484	1.884	1.832	1.955	1.917	2.167	2.078
	F	0.108	0.106	0.550	0.507	0.939	0.917	1.366	1.342	1.638	1.597	1.781	1.720	1.933	1.874
Cakaudrove	**P**	0.126	0.126	1.118	1.082	2.036	1.988	2.916	2.852	3.425	3.343	3.911	3.798	3.960	3.800
	M	0.073	0.073	0.558	0.539	1.059	1.029	1.477	1.444	1.801	1.757	2.043	1.976	2.066	1.976
	F	0.052	0.052	0.559	0.544	0.978	0.959	1.439	1.408	1.624	1.586	1.868	1.822	1.893	1.825
Macuata	**P**	0.088	0.082	0.888	0.858	1.802	1.751	2.522	2.454	2.948	2.871	3.198	3.094	3.360	3.238
	M	0.041	0.039	0.433	0.418	0.920	0.890	1.291	1.255	1.526	1.481	1.635	1.575	1.730	1.659
	F	0.046	0.043	0.456	0.440	0.882	0.860	1.231	1.199	1.423	1.389	1.563	1.519	1.630	1.580
Provinces of the Eastern Division															
Kadavu	**P**	0.096	0.090	0.905	0.881	1.835	1.794	2.797	2.713	3.370	3.340	4.122	4.013	3.943	3.811
	M	0.047	0.044	0.495	0.477	0.985	0.972	1.387	1.340	1.565	1.546	2.125	2.056	2.076	1.989
	F	0.049	0.047	0.410	0.404	0.851	0.823	1.410	1.373	1.805	1.794	1.997	1.957	1.867	1.822
Lau	**P**	0.141	0.131	1.068	1.034	1.912	1.863	2.716	2.619	3.533	3.467	3.991	3.871	3.943	3.779
	M	0.052	0.049	0.586	0.559	1.044	1.018	1.358	1.306	1.849	1.807	2.177	2.099	2.075	1.968
	F	0.089	0.082	0.481	0.475	0.868	0.845	1.358	1.313	1.684	1.660	1.814	1.772	1.868	1.811
Lomaiviti	**P**	0.087	0.079	0.953	0.941	1.816	1.755	2.867	2.794	3.515	3.390	3.950	3.821	3.905	3.776
	M	0.056	0.049	0.456	0.450	0.916	0.879	1.433	1.389	1.920	1.847	2.183	2.105	2.073	1.983
	F	0.031	0.030	0.497	0.491	0.900	0.875	1.435	1.405	1.595	1.543	1.767	1.716	1.832	1.793
Rotuma	**P**	0.106	0.106	0.975	0.950	1.778	1.667	3.346	3.269	3.759	3.704	3.612	3.478	3.746	3.509
	M	0.035	0.035	0.525	0.525	0.800	0.756	1.808	1.750	1.833	1.778	1.940	1.836	1.873	1.782
	F	0.071	0.071	0.450	0.425	0.978	0.911	1.539	1.519	1.926	1.926	1.672	1.642	1.873	1.727

Next, the D_i values corresponding with the P_i and S_i values in Table VII-B2 and 3 have been converted into lifetable q(x) values, using the Palloni-Seligman equations of the CEBCS programme of MORTPAK 4. The data input requirements for this programme include:

- The average number of children ever born, (P_i) by five-year age group of women (between age 15 and 49).
- The average number of children surviving (S_i) children by five-year age group of women (between age 15 and 49).
- The mean age of mothers at the time of childbearing ($\overline{M}^{Mo}$).

$\overline{M}^{Mo}$ can be calculated from birth registration data as well as census (survey) data. In this application, $\overline{M}^{Mo}$ has been calculated from 2007 Census data concerning the date of birth of the last born child. In the basic census tabulations, the children born in the year before the census are presented by age of mother.[35] The computational procedure leading to an estimate of $\overline{M}^{Mo}$ is shown in Table VII-B4.

Table VII-B4: Computational example of the mean age of mothers at the time of birth of their children ($\overline{M}^{Mo}$) for the total population derived from 2007 Census data

Age Women	i	Central Age (x)	Nr of children < Age 1 (w_i)	$w_i.x$
15-19	1	17	1,381	23,477
20-24	2	22	5,414	119,108
25-29	3	27	5,568	150,336
30-34	4	32	3,555	113,760
35-39	5	37	1,634	60,458
40-44	6	42	566	23,772
45-49	7	47	104	4,888
Sum	-	-	**18,222**	**495,799**

The variable x in this table is the central age of women in each of the five-year age groups whereas w_i is the number of children born in the year before the census by age group (i) of mother. The mean age of the mothers at the time of birth of their children ($\overline{M}^{Mo}$) is then calculated as a weighted average from:

$$\overline{M}^{Mo} = \left[\sum_{i=1}^{7}[w_i.x]\right] / \sum w_i$$

[35] The CEBCS programme of MORTPAK 4 also has the option to enter the average number of children ever born and average number of children surviving by duration of marriage. In the South Pacific Region, including Fiji, the lifetime fertility is never collected by duration of marriage of women.

The products $[w_i.x]$ for i = 1 to 7 are shown in column (5). Their total, $\sum[w_i.x]$ is 495,799. Consequently, $\overline{M}^{Mo}$ is calculated from dividing 495,799by the sum of all the weights, $\sum w_i$ which is 18,222.[36]

$$\overline{M}^{Mo} = 495,799/\ 18,222 = 27.2 \text{ years.}$$

Table VII-B5: $\overline{M}^{Mo}$ values by ethnicity and geographic sector at the national and provincial level derived from 2007 Census data

Province	Total Population			Fijians			Indians		
	All Sectors	Rural	Urban	All Sectors	Rural	Urban	All Sectors	Rural	Urban
Fiji	**27.2**	**27.4**	**27.0**	**27.8**	**27.9**	**27.5**	**25.8**	**25.6**	**25.9**
Provinces of the Western Division									
Ba	26.8	26.5	27.0	27.5	27.4	27.6	25.7	25.5	25.9
Nadroga/ Navosa	27.1	27.0	27.0	28.0	28.0	27.9	24.8	24.6	25.6
Ra	27.5	27.8	25.4	27.8	28.0	26.1	25.8	26.6	23.2
Provinces of the Central Division									
Naitasiri	27.0	27.6	26.9	27.6	27.8	27.6	25.6	26.1	25.6
Rewa	27.4	27.2	27.4	27.5	27.4	27.5	26.4	25.3	26.4
Tailevu	27.7	28.1	26.8	28.1	28.3	27.5	26.2	26.1	26.2
Namosi	28.5	28.5	*	28.6	28.6	*	27.6	27.6	*
Serua	26.8	27.6	25.5	27.4	28.2	25.0	25.0	24.9	25.1
Provinces of the Northern Division									
Bua	27.6	27.5	*	27.8	27.8	*	25.5	25.5	*
Cakaudrove	27.8	27.8	27.8	28.0	28.0	28.3	26.4	26.2	26.8
Macuata	27.0	27.1	27.0	27.9	28.0	27.7	26.0	25.8	26.2
Provinces of the Eastern Division									
Kadavu	28.1	28.1	*	28.1	28.1	*	*	*	*
Lau	27.7	27.7	*	27.7	27.7	*	*	*	*
Lomaiviti	28.3	28.3	*	28.3	28.3	*	*	*	*
Rotuma	28.9	28.9	*	*	*	*	*	*	*

The $\overline{M}^{Mo}$ values at the national and provincial level, by ethnicity and geographic sector, estimated from 2007 Census data are presented in Table VII-B5.

After identifying and entering the input data, the CEBCS programme of MORTPAK 4 can now be run. The output of this programme presents the q(x) values for x = 1, 2, 3, 5, 10, 15 and 20 according to the UN Model Life Tables for developing countries as well as for the four regional models of Coale and Demeny's set of Model Life Tables (MLT).

[36] It will be noted that the x values in column (3) are given as 17, 22, 27 ….47, and not as 17.5, 22.5, 27.5… 47.5. The reason for this is that the age of women in column (1) represents the age at the time of the 2007 Census. For the calculation of $\overline{M}^{Mo}$, the age of the women at the time of birth of their children is required. This age is on average 0.5 years less than their age at the time of the census. The same results will be obtained if 17.5, 22.5 ……. 47.5 are used as the central ages for the five-year age-groups and 0.5 years would be subtracted from the $\overline{M}^{Mo}$ value which is obtained. If the births in column (4) had been derived from a registration system, the central ages 17.5, 22.5 ……47.5 should have been used in the calculations. In a registration system, the recorded age of the mother is the age at the time that she gave birth.

In the case of Fiji, the most appropriate model is the Far Eastern model of the UN MLT set for developing countries. This conclusion is based on analysis of the pattern of mortality derived from data on death by age, sex and ethnicity collected by the NHIS since the early 1990s.[37]

The seven q(x) values (for x = 1, 2, 3, 5, 10, 15 and 20) for the total population by sex, ethnicity and geographic sector, according to the Far Eastern Model are presented in Table III-B6a-c. The corresponding life table l_x values (using an initial cohort of 1,000 persons, males and females) are also shown.[38]

Table VII-B6a: q(x), and the corresponding table l_x values, derived from 2007 Census D_i values using the "Far East" Palloni-Heligman equations for the total population

Age x	All children			Male children			Female children		
	D_i	q(x)	l_x	D_i	q(x)	l_x	D_i	q(x)	l_x
All Sectors									
1	.049	.050	950	.051	0.053	947	.047	.047	956
2	.038	.039	961	.039	0.041	959	.036	.037	963
3	.027	.027	973	.029	0.029	971	.024	.024	976
5	.023	.023	977	.025	0.025	975	.022	.022	978
10	.025	.025	975	.027	0.027	973	.023	.024	976
15	.028	.028	972	.031	0.031	969	.026	.025	975
20	.033	.033	967	.037	0.037	963	.029	.029	971
Rural Sector									
1	.038	.040	960	.040	.043	957	.037	.039	961
2	.035	.036	964	.038	.040	960	.031	.032	968
3	.026	.026	974	.030	.030	970	.023	.022	978
5	.026	.026	974	.028	.028	972	.023	.023	977
10	.027	.027	973	.031	.031	969	.023	.023	977
15	.031	.031	969	.035	.035	965	.028	.028	972
20	.037	.037	963	.040	.041	959	.032	.032	968
Urban Sector									
1	.060	.059	961	.063	.063	937	.057	.056	944
2	.041	.042	958	.040	.042	958	.041	.042	958
3	.027	.028	972	.028	.028	972	.027	.027	973
5	.021	.021	979	.021	.021	979	.021	.021	979
10	.023	.023	977	.022	.022	978	.024	.024	976
15	.025	.025	975	.027	.027	973	.023	.023	977
20	.030	.030	970	.033	.033	967	.026	.026	974

[37] Bakker, 2013 (forthcoming)
[38] This figure 1,000 is the radix of the lifetable.

Table VII-B6b: q(x), and the corresponding table l_x values, derived from 2007 Census D_i values using the "Far East" Palloni-Heligman equations for Fijians

Age x	All children			Male children			Female children		
	D_i	q(x)	l_x	D_i	q(x)	l_x	D_i	q(x)	l_x
All Sectors									
1	.047	.049	951	.045	.047	953	.048	.051	949
2	.038	.039	961	.041	.043	957	.035	.036	961
3	.026	.027	973	.030	.030	970	.023	.023	977
5	.023	.024	976	.025	.025	975	.022	.022	978
10	.025	.025	975	.027	.028	972	.022	.022	978
15	.028	.028	972	.031	.031	969	.024	.024	976
20	.034	.034	966	.038	.039	961	.029	.029	971
Rural Sector									
1	.035	.037	963	.039	.031	969	.031	.029	971
2	.036	.037	963	.041	.044	956	.031	.031	969
3	.025	.025	975	.028	.027	973	.023	.023	977
5	.026	.026	974	.028	.028	972	.023	.023	977
10	.026	.027	973	.030	.031	969	.022	.022	977
15	.029	.030	970	.032	.032	968	.027	.027	973
20	.038	.038	962	.042	.042	958	.033	.034	966
Urban Sector									
1	.061	.069	931	.052	.063	937	.069	.075	925
2	.039	.042	958	.040	.043	957	.039	.040	960
3	.028	.029	971	.033	.034	966	.024	.025	975
5	.021	.021	979	.021	.021	979	.020	.020	980
10	.022	.023	977	.023	.024	976	.022	.022	978
15	.025	.025	975	.029	.028	972	.021	.021	979
20	.028	.028	972	.033	.034	966	.022	.023	977

Table VII-B6c: q(x), and the corresponding table l_x values, derived from 2007 Census D_i values using the "Far East" Palloni-Heligman equations for Indians

Age x	All children			Male children			Female children		
	D_i	q(x)	l_x	D_i	q(x)	l_x	D_i	q(x)	l_x
All Sectors									
1	.048	.047	953	.058	.058	942	.042	.040	960
2	.037	.038	962	.036	.038	974	.037	.038	962
3	.027	.027	973	.027	.027	971	.027	.027	973
5	.023	.023	977	.024	.024	968	.022	.022	978
10	.025	.025	975	.026	.026	974	.025	.024	976
15	.030	.029	971	.033	.031	969	.027	.026	974
20	.033	.031	969	.035	.034	966	.030	.029	971
Rural Sector									
1	.046	.047	953	.042	.044	956	.049	.049	951
2	.032	.034	966	.032	.034	966	.032	.033	967
3	.029	.029	971	.034	.034	966	.023	.023	977
5	.025	.025	975	.027	.027	973	.023	.022	978
10	.027	.027	973	.030	.030	970	.024	.024	976
15	.034	.033	967	.039	.037	963	.029	.028	972
20	.033	.032	968	.037	.036	964	.029	.027	973
Urban Sector									
1	.050	.048	952	.071	.069	931	.036	.033	967
2	.041	.042	958	.040	.042	958	.041	.042	958
3	.026	.026	974	.021	.021	979	.030	.030	970
5	.022	.022	978	.022	.021	979	.022	.022	978
10	.023	.023	977	.022	.022	978	.025	.025	975
15	.026	.025	975	.027	.026	974	.025	.024	976
20	.032	.031	969	.033	.031	969	.031	.030	970

Finally, Table VII-B7 presents the q(x) values at the provincial level by sex

Table VII-B7: q(x) values, derived from 2007 Census D_i values at the provincial level by sex, using the "Far East" Palloni-Heligman equations

Province	Sex	q(x) values for x =						
		1	2	3	5	10	15	20
Fiji	**P**	**.050**	**.039**	**.027**	**.023**	**.025**	**.028**	**.033**
	M	**.053**	**.041**	**.029**	**.025**	**.027**	**.031**	**.037**
	F	**.047**	**.037**	**.024**	**.022**	**.024**	**.025**	**.029**
Provinces of the Western Division								
Ba	**P**	.043	.038	.029	.025	.027	.028	.032
	M	.064	.045	.031	.022	.027	.030	.034
	F	.032	.032	.027	.028	.028	.026	.028
Nadroga/ Navosa	**P**	.046	.042	.023	.021	.026	.034	.035
	M	.046	.044	.022	.027	.034	.040	.038
	F	.045	.040	.024	.013	.018	.026	.032
Ra	**P**	.031	.040	.032	.023	.025	.030	.039
	M	.016	.053	.039	.026	.031	.032	.038
	F	.044	.026	.024	.020	.019	.028	.040
Provinces of the Central Division								
Naitasiri	**P**	.068	.041	.025	.019	.023	.027	.029
	M	.082	.041	.027	.021	.025	.029	.034
	F	.079	.047	.025	.017	.022	.025	.025
Rewa	**P**	.069	.053	.025	.023	.021	.022	.025
	M	.063	.057	.028	.027	.022	.025	.029
	F	.075	.056	.021	.019	.020	.020	.022
Tailevu	**P**	.040	.030	.027	.021	.029	.026	.040
	M	.020	.025	.033	.025	.029	.027	.042
	F	.058	.034	.019	.018	.029	.024	.038
Namosi	**P**	.044	.012	.012	.024	.016	.041	.058
	M	.083	.016	.016	.036	.016	.036	.068
	F	.000	.008	.008	.012	.017	.047	.047
Serua	**P**	.021	.015	.030	.033	.030	.025	.037
	M	.011	.020	.030	.032	.029	.028	.036
	F	.036	.009	.031	.034	.030	.022	.037
Provinces of the Northern Division								
Bua	**P**	.019	.065	.025	.026	.027	.027	.036
	M	.018	.052	.028	.032	.028	.020	.041
	F	.020	.079	.023	.018	.026	.034	.031
Cakaudrove	**P**	.000	.032	.023	.021	.024	.029	.040
	M	.000	.036	.028	.022	.025	.033	.044
	F	.000	.028	.018	.021	.023	.024	.036
Macuata	**P**	.074	.036	.029	.027	.027	.032	.036
	M	.060	.036	.032	.027	.029	.036	.041
	F	.086	.036	.025	.026	.024	.028	.031
Provinces of the Eastern Division								
Kadavu	**P**	.069	.028	.022	.030	.009	.027	.034
	M	.072	.038	.013	.034	.013	.033	.043
	F	.044	.015	.033	.026	.006	.020	.025
Lau	**P**	.079	.033	.025	.036	.019	.030	.042
	M	.067	.048	.024	.038	.023	.036	.052
	F	.081	.013	.026	.033	.015	.023	.031
Lomaiviti	**P**	.106	.013	.033	.026	.037	.033	.034
	M	.136	.014	.040	.031	.039	.036	.045
	F	.039	.013	.027	.021	.032	.029	.022
Rotuma	**P**	.000	.026	.062	.023	.015	.037	.063
	M	.000	.000	.056	.032	.032	.057	.049
	F	.000	.056	.068	.013	.000	.018	.078

1.4 Adjustment of child survivorship data

The q(x) values, estimated from lifetime fertility data collected in a census, seldom portray an entirely consistent pattern. The q(x) and corresponding l_x values for the total population of Fiji, shown in Table VII-B6a-c and particularly the provincial level q(x) values in Table VII-B7, are good examples of this lack of consistency. Since the q(x) values represent probabilities of dying between birth and age x, the subsequent q(x) values for x = 1, 2, 3, 5, 10, 15, and 20 can only increase, since the next probability always includes additional exposure to the event death. Similarly, the lifetable l_x function is a continuously decreasing function between age 0 and age ω (the highest age).

In Tables VII-B6 and 7, the subsequent q(x) values are in many cases not increasing and the corresponding l_x values are not decreasing with increasing age. Particularly the probability of dying between birth and age 1, q(1), appears in most cases to be inconsistent with the mortality risks from birth to higher ages. These q(1) values have been estimated from the often questionable data provided by the youngest age group of women under consideration, those aged 15 - 19.[39] In the present analysis, the reports by these young women have not further been taken into account.

Furthermore, we have seen that the lifetime fertility reports of the female respondents are, with rising age of these women, increasingly affected by recall (or memory) lapse. Older women who provide this information do, for a variety of reasons, often not report all their children, particularly if these children died at a very early age, i.e. immediately after birth. Recall lapse in the lifetime fertility data collected during the early censuses in Fiji is serious. Lifetime fertility data from recent censuses is less affected by recall lapse, but this form of bias has certainly not become a thing of the past.

Evidence from censuses in Fiji, as well as censuses in many other countries suggests that the most accurate lifetime fertility information is often provided by women in the age range 20 to 34. These women are relatively young and their fertility experience is relatively recent. Moreover, these younger women are usually better educated than the older women. In conclusion, it may be assumed that the effects of recall lapse (omission of children) in Fiji should not be very serious if the analysis is limited to data provided by women in the age range 20 to 34.

Several methods have been devised to adjust child survivorship data derived from lifetime fertility information collected in censuses or surveys. Because of the quality of the 2007 Census lifetime fertility data, some of these more sophisticated techniques may not be very appropriate.[40] The present analysis uses a rather simple technique. However, in the case of the

[39] The lifetime fertility reports of these very young women are, for various reasons, often incomplete and unreliable. In addition, it needs to be stressed that in countries in the South Pacific Region, including Fiji, children born to these very young women aged 15-19, are frequently adopted by an older relative (often a grandmother or an aunt). Theses foster mothers often report the child as their own (natural) child. Furthermore, the data for the 15 - 19 age-group of women is often affected by age misreporting, although, in Fiji, this problem is not as serious anymore as it used to be in the early censuses.

[40] For instance, the proportions of children dead amongst children ever born by age of mother (Di) have sometimes been adjusted using standard proportions of children dead by age of mother. (Brass, 1975:104). For instance Brass (1979:9–10) used lifetime fertility data from the 1966 Census data for Fijians and Indians in Fiji to demonstrate

2007 Census lifetime fertility data, the advantage of this technique is that it only uses the lifetime fertility reports by women in the age group 20-34. More precisely, it is based on the lifetable l_2, l_3 and l_5 values corresponding with the estimated q(2), q(3) and q(5) values. These three q(x) and l_x values are arguably the most reliable ones estimated from the 2007 Census lifetime fertility dataset. In spite of this, these selected values (presented in Table VII-B6 and 7) are clearly inconsistent. As mentioned, with increasing age x, the q(x) values can only increase and the corresponding lx values can only decrease. With regard to the selected three q(x) values and l_x values (in Tables VII-B6 and 7), this appears to be seldom the case.

Table VII-B8: Comparison of unadjusted and adjusted l_x values (x = 2, 3 and 5) for the total population by sex, ethnicity and geographic sector

Ethnicity	Age	Unadjusted l_x			Adjusted l_x^f		
		Persons	Males	Females	Persons	Males	Females
All Sectors							
Total Population	**2**	961	959	963	974	972	976
	3	973	971	976	971	969	973
	5	977	975	978	968	966	970
Fijians	**2**	961	957	964	974	972	977
	3	973	970	977	971	968	974
	5	976	975	978	968	965	971
Indians	**2**	962	962	962	974	974	975
	3	973	973	973	971	971	972
	5	977	976	978	968	968	968
Rural Sector							
Total Population	**2**	964	960	968	974	971	977
	3	974	970	978	971	968	974
	5	974	972	977	968	964	972
Fijians	**2**	963	956	969	974	971	977
	3	975	973	977	971	967	974
	5	974	972	977	968	964	972
Indians	**2**	966	966	967	974	972	977
	3	971	966	977	971	968	974
	5	975	973	978	968	965	971
Urban Sector							
Total Population	**2**	958	958	958	974	974	974
	3	972	972	973	971	970	971
	5	979	979	979	968	967	968
Fijians	**2**	958	957	960	974	972	976
	3	971	966	975	970	969	973
	5	979	979	980	967	965	970
Indians	**2**	958	958	958	974	976	973
	3	974	979	970	971	973	970
	5	978	979	978	968	970	966

this adjustment procedure. This technique has also been used in the mortality analysis of 1996 Census data in Fiji. This application is explained in FBoS, 1998:197-199.

The adjustment procedure has fully been documented in the forthcoming FBoS Research Monograph on mortality.[41] The results of the adjustment are shown in Table VII-8. In this table, adjusted l_x^f values for x = 2, 3 and 5 for the total population by sex, ethnicity and geographic sector are compared with the unadjusted l_x values. Adjusted values l_2^f at the provincial level by sex and ethnicity derived from child survivorship data from the 2007 Census are shown in Table VII-B9.

Table VII-B9: Adjusted l_x values (x = 2, 3 and 5) at the provincial level by sex

Province	Persons			Males			Females		
	l_2	l_3	l_5	l_2	l_3	l_5	l_2	l_3	l_5
Fiji	**974**	**971**	**968**	**972**	**969**	**966**	**976**	**973**	**970**
Provinces of the Western Division									
Ba	973	970	966	972	968	965	974	971	968
Nadroga/Navosa	976	973	970	973	970	967	979	977	974
Ra	972	969	966	966	962	958	979	977	974
Provinces of the Central Division									
Naitasiri	976	973	970	974	971	968	976	973	970
Rewa	972	969	965	969	965	961	975	972	968
Tailevu	977	974	971	976	972	969	979	977	974
Namosi*	974	971	968	972	969	966	976	973	970
Serua	978	975	973	976	973	970	981	979	976
Provinces of the Northern Division									
Bua	969	965	961	968	964	960	971	968	964
Cakaudrove	977	974	971	975	972	969	980	977	975
Macuata	973	969	966	972	968	965	975	972	969
Provinces of the Eastern Division									
Kadavu	976	973	971	977	974	971	979	976	974
Lau	972	969	965	968	965	961	980	978	975
Lomaiviti	980	978	975	977	974	971	983	980	978
Rotuma	970	966	962	974	970	966	966	962	958

Note * The quality of the lifetime fertility data for the small population of Namosi was insufficient for the estimation of early childhood mortality parameters. The national average parameters have been imputed.

In Section 3 of Part B, the childhood mortality indices representing the average early childhood mortality situation as reported by women 20-34, will be used as one of the elements for the generation of two-parameter logit lifetables.

[41] Bakker, 2013 (forthcoming)

2 Adult mortality

Section 1 was concerned with the indirect estimation of early childhood mortality indices from lifetime fertility data collected during censuses. Early childhood mortality indices by sex, ethnicity and geographic sector were estimated from 2007 lifetime fertility information. In addition, early childhood mortality indices at the provincial level were also estimated.

Section 2 deals with the indirect estimation of female (male) adult mortality from maternal (paternal) orphanhood data collected during censuses. This section starts again with a brief assessment of the most important shortcomings of the orphanhood data collected in a census. It continues with a brief review of the methodology used in adult mortality estimation but this is again explained in more detail in the forthcoming FBoS Research Monograph on Mortality.

Section 2 then continues with an application of the maternal and paternal orphanhood techniques respectively. The analysis focuses on 2007 Census data also makes use of the orphanhood data collected during the 1996 Census.

2.1 Basic data and its restrictions and problems

The Interview Schedules of the 1946, 1956 and 1966 Censuses did not include any retrospective questions from which adult mortality can be estimated. The development of the analytical techniques for the indirect estimation of female and male mortality from retrospective questions in a census (survey) started in the early 1970s. The so-called maternal and paternal orphanhood techniques require the inclusion of two simple questions on the Census (Survey) Interview Schedule, viz.[42]

- *Is this person's own mother still alive?* *1. Yes 2. No*

- *Is this person's own father still alive?* *1. Yes 2. No*

These straightforward questions require a simple yes or no answer (or of course don't know).The answers to both questions are tabulated by age and sex of respondents.

The collection of the maternal and paternal orphanhood data seems to be relatively straightforward. However, as in the case of lifetime fertility data, this data is usually affected by several types of bias. For a meaningful analysis and interpretation of maternal and paternal orphanhood data, the shortcomings of the data and the techniques must be clearly understood. The most important problems and restrictions associated with this data are discussed below.

- Zero-parity bias and multiple reporting

  The adult mortality estimates derived from the proportions of respondents with surviving mother/father do not refer to the entire population. They reflect the mortality experience of parents with surviving children. For instance, in order for a mother (or father) to be included in the orphanhood reports of a census:

[42] These orphanhood techniques were first applied to data collected during censuses and surveys in several former British colonies, including some in the South Pacific Region,

- The mother/father must have at least one surviving natural child.
- This child must be included in the census (survey)

In other words, the mortality experience of zero-parity females and males, and females and males with no surviving child as well as those with surviving children that are not included in the census will not be reflected in the data. Similarly, females and males who have more than one surviving natural child and all these children are included in the census will be represented more than once in the orphanhood data of this census. For instance, the vital status of a mother who has given birth to ten children who all survived until the time of the census and were all included in the census will be reported ten times. On the other hand, the vital status of a mother who has also given birth to ten children but all these children have passed away or were overseas at the time of the census will not be reported at all. Some attempts have been made to adapt the orphanhood techniques to take account of this kind of bias, but the results are not promising.[43]

If it may be assumed that, for a particular population, the mortality experience of zero-parity women and women who have given birth to one or more children is the same, the orphanhood data will not be affected by this type of bias. However, it is unlikely that this assumption is valid. For any population, it is likely that the following groups of mothers have a higher than average mortality risk:

- High parity women[44]
- Women who were outside the age range 20-34 when they gave birth
- Women who spaced their children insufficiently (too short birth interval).

In conclusion, the orphanhood reports collected during a census do not represent the mortality experience of the entire population. Moreover, the mortality experience of high-parity respondents will be overrepresented. It can only be hoped that the biases in the orphanhood data will offset each other to some extent and that the net effect of the biases will not be very significant.

- Adoption bias

Orphanhood data collected during censuses (and to a less extent also in surveys) in the South Pacific Region, including Fiji, is usually affected by an 'adoption bias'. This bias tends to be particularly serious in the case of young respondents who have been adopted. Readers are reminded again that during a census, these young respondents seldom answer the census questions themselves. An adult person in the household, in many cases the natural or foster mother or father answers the questions for these young children. In censuses (as well as surveys) in countries in the South Pacific Region, including Fiji, foster parents often report adopted children as their own or natural children. If the natural father

[43] One attempt of adapting the orphanhood techniques has been made by Hill, Behm and Soliz (1976). They proposed to restrict the maternal and paternal orphanhood questions to one child per parent i.e. the oldest surviving child. However, it is not feasible to identify the oldest surviving child, especially in a census interview situation. It was found that this refinement of the orphanhood techniques does in practice not lead to better adult mortality estimates. This approach has never been attempted in Fiji.

[44] These are women who have given birth to a large number of children

and mother have exactly the same characteristics as the foster father and mother, the adoption bias in the orphanhood data may not be very serious. However, this is usually not the case. For instance, on average, the natural parents of a child are younger than its foster parents.

It is difficult, if not impossible to quantify the impact of the adoption bias on orphanhood data of censuses in Fiji. It must, however be assumed that this bias is not insignificant. In other words, it must be assumed that the orphanhood reports, and especially those of very young children, contain a significant amount of bias. In the analysis in this section, not much weight is therefore given to the orphanhood reports of very young respondents.

- Time references of orphanhood indices

The adult mortality indices derived from the maternal and paternal orphanhood data collected in a census refer to ill-defined long intervals of exposure to the risk of dying. If there has been no change in mortality in the fifteen or so years before the census, this problem is not serious. However, in a situation of changing mortality, especially rapidly changing mortality, this long and ill-defined reference period becomes a very significant problem. A first requirement is that the time reference of each of the survival probabilities must be established.[45]

Mortality analysis based on the data of the 1986 and 1996 censuses as well as NHIS data in Fiji, suggests that during the last few decades, the adult mortality transition in Fiji has stagnated. Moreover, the results of the most recent analysis of NHIS data suggest that adult mortality in Fiji at the beginning of the new millennium may be on the increase again. For policy makers and planners, it is important that the adult mortality situation and trend is reassessed on a regular basis.

Fortunately, the maternal and paternal orphanhood questions have been included in all censuses in Fiji since 1976. This makes it possible to carry out a more sophisticated analysis of adult mortality, based on survival probabilities for intercensal hypothetical cohorts (HC) of respondents. The adult mortality estimates for these HCs refer to the mid-point between the two censuses. This approach of basing adult mortality estimates on the orphanhood data from two censuses instead of only one increases the usefulness of the maternal and paternal orphanhood techniques very significantly.

The refined orphanhood technique, based on the data from two censuses, does, however, come with an additional ideal condition. The calculation of survival probabilities for intercensal cohorts is relatively straightforward when the intercensal census period is a multiple of 5 years.[46] This was the case during the 1996 Census analysis when the orphanhood data from this census was used in combination with that of the 1986 Census. The interval between these two censuses is very close to ten years. Consequently, the survival probabilities for the intercensal hypothetical cohort refer to the year 1981 (or the midpoint of the 1986-1996 intercensal period).

Unfortunately, the most recent intercensal period in Fiji (1996-2007) is not a multiple of five years. Nevertheless, the refined technique has been applied to the awkward 1996-2007

[45]The output of the more recent versions of the original maternal and paternal orphanhood techniques provides the time references all the survival probabilities that are being estimated.
[46] UN Manual X, 1983, pp. 109-110.

intercensal period. Since mortality does not seem to have changed significantly since 1996, this deviation from the ideal conditions probably only has a negligible impact on the results.

In addition, it also needs to be mentioned that, ideally, the comparison between two sets of orphanhood data collected during subsequent censuses should not be affected by a migration bias. It is obvious that in Fiji, since the coups in 1987, the impact of migration on indirect estimates of mortality has increasingly become a problem, particularly for the Indian population.

More generally, with regard to the validity of the orphanhood data collected in censuses (surveys), the results of many censuses (surveys) suggest that maternal orphanhood data tends to be more complete and reliable than paternal orphanhood data.[47] The reason for this is obvious. Virtually all respondents know the vital status of their own (natural) mother but, in many populations, a significant proportion of respondents do not know the vital status of their own (natural) father. In this respect, it is also relevant that in many societies, the proportion of absentee natural fathers is significant.[48] Furthermore, in case of adoption, it is usually more likely that the adopted person is aware of the vital status of his/her natural mother than that of his/her natural father.

Finally, it may reasonably be expected that because of the often sensitive character of the maternal and paternal orphanhood questions, the response to these questions should be more complete and reliable in the case of a survey than in a census.

2.2 Methodology

In the 1940s and 1950s the Fijian and Indian population approached the quasi-stable state. Moreover, international migration was still very restricted. During the first two decades after World War II, adult mortality in Fiji was therefore estimated from census age-sex structures using intercensal survival and stable/quasi-stable techniques. These techniques still led to reasonable estimates of adult mortality, since the prerequisites for the use of these techniques were still met, especially in the case of the Fijians.[49]

Since 1966, the use of these techniques led to increasingly more questionable estimates of mortality.

- With regard to intercensal survival, this was mainly due to the very significant increase in international migration, particularly for the Indian component of the population. Because of the incompleteness and deficiency of the international migration data, it was not possible to adjust the census age-sex structures adequately for net migration during the intercensal period. After the coups in 1987, 2000 and 2006, international migration has further increased. Unfortunately, the completeness and quality of transit statistics on

[47] This is amongst others clear from the usually much higher number of Not Stated cases in the case of paternal orphanhood data than in the case of maternal orphanhood data.
[48] The mortality analysis of paternal orphanhood data in some African countries shows an unexpectedly large proportion of respondents who reported that their own father is dead. In an attempt to explain this, it was hypothesized that respondents may find it easier to report that the natural father is dead than that he is alive and has deserted his family.
[49] For the use of stable, quasi-stable and intercensal survival techniques in the analysis of 1946, 1956 and 1966 census data in Fiji, see: Bakker, 2013 (forthcoming).

international migration remains very inadequate and adjustment of census age-sex structures using this data continues to lead to very unsatisfactory results.[50]

- Moreover, in the late 1950's, Indian fertility started to decrease and after a certain time lag, Fijian fertility as well. It was not possible to adjust the quasi-stable estimates for changing fertility (as had been done in the case of decreasing mortality).

Another major problems with the above techniques based on census age-sex structures is that they do not provide estimates of infant and child mortality. Moreover, in the absence of reliable age-sex specific data on internal migration, these techniques have never led to reliable estimates of mortality at the sub-national level (i.e. the provinces) and for the geographic sectors.

Since death registration data remained very incomplete and deficient and the techniques used so far in census analysis led to increasingly more doubtful results, the FBoS decided to introduce the maternal and paternal orphanhood questions on the 1976 Census Interview schedule. From the answers to these questions, proportions of respondents with mother/father still alive, by age of respondent were derived.

In Section 1 of this chapter, it was noted that the proportions of dead children amongst children ever born by age of mother, derived from lifetime fertility data provide some imprecise and vague idea of the level of early childhood mortality. These vague indices were therefore converted into precise lifetable probabilities of dying between birth and age (x). Similarly, the proportions of respondents with mother/father still alive, by age of respondent, derived from census (survey) maternal and paternal orphanhood data provide a vague idea of the general level of female and male adult mortality. Once again, these imprecise measures need to be converted into precise and unambiguous lifetable probabilities. Several methods have been devised to realize conversion. In 1976, Fiji adopted the Brass/Hill orphanhood techniques. Subsequent censuses also used the original Brass-Hill techniques as well as derivatives of these techniques.[51]

Generally, the application of the maternal orphanhood technique is more straightforward than the application of the paternal orphanhood technique. This is also the case in Fiji since:

- In the case of fathers the reproductive age span is much longer and not as well defined as in the case of mothers.

- The mean age of fathers at the time of birth of their children, $\overline{M}^{Fa}$, cannot be calculated from birth registration data. Newborn children are tabulated by age of mother and not by age of father.

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[50] During the mortality analysis of 1996 census data, intercensal survival techniques were applied using the 1986 and 1996 census age-sex structures by ethnicity. Before applying these techniques, the 1996 census age-sex structures were adjusted for age-sex specific net migration during the 1986-1996 intercensal period. Due to the serious shortcomings of the net migration data, this approach led to very unsatisfactory results, particularly for the Indian component of the population. (FBoS, 1998: 52. See also Technical Note 11). At the sub-national level, i.e. the provinces, the intercensal survival, stable and quasi-stable techniques have never provided statistically satisfactory results.

[51] Brass, W and K.H. Hill, 1973:111-123. This article gives the background and rationale for the maternal and paternal orphanhood techniques. The methods are applied in UN Manual X, 1983 (Chapter IV).The application of the Brass-Hill orphanhood techniques to maternal and paternal orphanhood data in Fiji is explained in Bakker, 2013 (forthcoming).

- The census question concerning the date of last born child is linked with the age of mother and not with the age of father.

- At the time of birth of a child, its natural mother must be alive. However, this is not necessarily so in the case of the natural father. He must have been alive at the time of conception but may have died soon after that.

2.3. Estimation of female adult mortality

2.3.1. Basic data

Table VII-B10 presents the proportions of respondents with mother still alive at the time of the 1996 and 2007 censuses.

After the analysis of the 1996 Census data as well as recent death registration data from the NHIS, it was concluded that the adult mortality transition is stagnating and that mortality of adults may well be on the increase again. Although it is difficult to draw firm conclusions from the data in Table VII-B11, the more so since the proportions with mother alive in 1996 and 2007 do not appear to be entirely consistent, the impression that is conveyed is that these conclusions are probably correct. It appears that female adult mortality in the Eastern Division; especially in Rotuma is higher than the national average.

Table VII-B10: Proportions of 1996 and 2007 Census respondents with mother still alive at the national and provincial level by ethnicity

Province	Total population		Fijians		Indians	
	1996	2007	1996	2007	1996	2007
Fiji	**.7930**	**.7605**	**.7912**	**.7630**	**.7951**	**.7555**
Ba	.7915	.7766	.7880	.7853	.7926	.7686
Nadroga/ Navosa	.7794	.7316	.7684	.7264	.7928	.7378
Ra	.7816	.7433	.7795	.7557	.7858	.7135
Naitasiri	.8083	.7766	.8109	.7848	.8038	.7639
Rewa	.7984	.7590	.7994	.7601	.7917	.7431
Tailevu	.7814	.7361	.7779	.7328	.7896	.7460
Namosi	.8083	.7860	.8104	.7854	.7883	.8016
Serua	.7941	.7562	.7982	.7694	.7928	.7400
Bua	.7875	.7393	.7872	.7367	.7858	.7406
Cakaudrove	.7847	.7522	.7844	.7518	.7958	.7630
Macuata	.8012	.7516	.8023	.7753	.8006	.7349
Kadavu	.7690	.7106	.7691	.7103	*	*
Lau	.7708	.7247	.7721	.7239	*	*
Lomaiviti	.7871	.7424	.7886	.7438	.7780	.6964
Rotuma	.7021	.6893	*	*	*	*

Table VII-B11 presents the proportions with mother alive by five-year age groups of respondents as reported during the 1996 and 2007 Censuses, but only at the national level. The proportions for an intercensal hypothetical cohort (HC) 2001 have been added.[52]

It will be noted that for most values of n between 5 and 35, the proportions for the HC 2001 are lower and for subsequent values of n, the proportions for the HC 2001higher than those for the HC 1991. The gap tends to increase with increasing age. This suggests that female adult mortality may have increased during the intercensal period. However, there are other factors which may have contributed to this picture.

Table VII-B11a: Proportions of 1996 and 2007 Census respondents in five-year age groups with mother still alive at the national level by ethnicity as well as these proportions for a 2001 HC. All sectors

Age Group	Total population			Fijians			Indians		
	1996	2007	2001HC	1996	2007	2001HC	1996	2007	2001HC
0-4	.9947	.9946	**.9946**	.9946	.9941	**.9941**	.9948	.9959	**.9959**
5-9	.9911	.9852	**.9852**	.9896	.9820	**.9820**	.9935	.9920	**.9920**
10-14	.9848	.9691	**.9690**	.9816	.9616	**.9612**	.9885	.9817	**.9828**
15-19	.9691	.9340	**.9284**	.9616	.9135	**.9065**	.9771	.9647	**.9632**
20-24	.9387	.9265	**.9116**	.9306	.9138	**.8948**	.9479	.9460	**.9406**
25-29	.8800	.8823	**.8452**	.8717	.8674	**.8177**	.8885	.9027	**.8899**
30-34	.8023	.8176	**.7940**	.7971	.8001	**.7693**	.8076	.8399	**.8335**
35-39	.6994	.7258	**.6971**	.6962	.7057	**.6620**	.6995	.7481	**.7492**
40-44	.5771	.6007	**.5945**	.5645	.5739	**.5539**	.5825	.6300	**.6503**
45-49	.4338	.4890	**.4874**	.4164	.4645	**.4417**	.4423	.5111	**.5474**
50-54	.3012	.3616	**.3725**	.2762	.3287	**.3225**	.3195	.3882	**.4334**
55-59	.1917	.2688	**.3020**	.1640	.2387	**.2531**	.2205	.2958	**.3661**
60-64	.1020	.2180	**.2696**	.0844	.1970	**.2300**	.1243	.2410	**.3268**
65-69	.0560	.1584	**.2495**	.0427	.1311	**.2024**	.0711	.1968	**.3267**
70-74	.0308	.0962		.0319	.0771	**.2101**	.0328	.1241	**.3264**
75+	.0338								
Total	**.7930**	**.7605**		**.7912**	**.7630**		**.7951**	**.7555**	

[52] The computational procedure of the proportions for the HC 2001 is explained in Bakker, 2013 (forthcoming).

Table VII-B11b: Proportions of 1996 and 2007 Census respondents in five-year age groups with mother still alive at the national level by ethnicity as well as these proportions for a 2001 HC. Rural Sector

Age Group	Total population			Fijians			Indians		
	1996	2007	2001HC	1996	2007	2001HC	1996	2007	2001HC
0-4	.9954	.9940	**.9940**	.9951	.9938	**.9938**	.9956	.9952	**.9952**
5-9	.9901	.9806	**.9806**	.9887	.9771	**.9771**	.9927	.9913	**.9913**
10-14	.9852	.9622	**.9609**	.9827	.9525	**.9512**	.9888	.9835	**.9832**
15-19	.9687	.9219	**.9130**	.9616	.8933	**.8828**	.9769	.9693	**.9679**
20-24	.9355	.9204	**.8977**	.9276	.9088	**.8797**	.9458	.9437	**.9383**
25-29	.8769	.8744	**.8241**	.8708	.8633	**.7926**	.8854	.8965	**.8882**
30-34	.7958	.8060	**.7734**	.7928	.7925	**.7515**	.8009	.8311	**.8245**
35-39	.6924	.7104	**.6676**	.6940	.6940	**.6317**	.6915	.7371	**.7394**
40-44	.5677	.5872	**.5706**	.5600	.5663	**.5369**	.5749	.6174	**.6356**
45-49	.4156	.4752	**.4582**	.4022	.4519	**.4113**	.4303	.5086	**.5437**
50-54	.2820	.3419	**.3436**	.2674	.3137	**.3008**	.2991	.3793	**.4194**
55-59	.1768	.2480	**.2735**	.1576	.2194	**.2234**	.2027	.2936	**.3711**
60-64	.0912	.1876	**.2286**	.0741	.1702	**.1915**	.1204.	.2203	**.3088**
65-69	.0482	.1316	**.2035**	.0360	.1068	**.1520**	0705	.1832	**.3354**
70-74	.0297	.0790	**.1979**	.0285	.0579	**.1497**	.0320	.1273	**.3266**
75+									
Total	**.7859**	**.7461**							

Table VII-B11c: Proportions of 1996 and 2007 Census respondents in five-year age groups with mother still alive at the national level, by ethnicity as well as these proportions for a 2001 HC. Urban Sector

Age Group	Total population			Fijians			Indians		
	1996	2007	2001HC	1996	2007	2001HC	1996	2007	2001HC
0-4	.9939	.9952	**.9952**	.9936	.9945	**.9945**	.9940	.9964	**.9964**
5-9	.9925	.9905	**.9905**	.9912	.9893	**.9893**	.9943	.9925	**.9925**
10-14	.9842	.9769	**.9782**	.9799	.9747	**.9755**	.9881	.9802	**.9826**
15-19	.9695	.9446	**.9427**	.9617	.9330	**.9312**	.9773	.9608	**.9590**
20-24	.9414	.9312	**.9255**	.9337	.9184	**.9142**	.9496	.9476	**.9423**
25-29	.8831	.8887	**.8691**	.8727	.8718	**.8442**	.8915	.9066	**.8897**
30-34	.8093	.8263	**.8123**	.8030	.8090	**.7921**	.8143	.8460	**.9395**
35-39	.7068	.7401	**.7242**	.6992	.7197	**.6963**	.7069	.7566	**.7550**
40-44	.5867	.6142	**.6165**	.5705	.5835	**.5756**	.5893	.6406	**.6604**
45-49	.4530	.5024	**.5148**	.4357	.4808	**.4788**	.4536	.5130	**.5479**
50-54	.3235	.3803	**.3996**	.2895	.3481	**.3513**	.3400	.3949	**.4426**
55-59	.2115	.2893	**.3287**	.1753	.2657	**.2920**	.2393	.2975	**.3593**
60-64	.1172	.2504	**.3093**	.1051	.2375	**.2882**	.1284	.2578	**.3356**
65-69	.0682	.1909	**.2967**	.0581	.1737	**.2893**	.0719	.2085	**.3131**
70-74	.0367	.1181	**.3117**	.0406	.1138	**.3119**	.0336	.1213	**.3172**
75+									
Total	**.8011**	**.7745**							

2.3.2. Female survival probabilities

In this section, female adult mortality is estimated:

- From 2007 Census data concerning maternal orphanhood
- For a 1996-2007 intercensal hypothetical cohort (HC 2001)

Proportions of respondents with surviving mother have been converted into female survival probabilities

$$\mathbf{l_f\,(25+N) \,/\, l_f\,(25) \text{ for } N = 10 \text{ to } 55}$$

The female survival probabilities at the national level by ethnicity and geographic sector have been summarized in Table VII-B12a-c.

Table VII-B12a: Summary of female survivorship probabilities, l(25+N)/l(25, at the national level by ethnicity in 2007 and for the 2001 HC: All sectors

Age (N)	Total population		Fijians		Indians	
	2007	2001HC	2007	2001HC	2007	2001HC
10	.9794	.9794	.9752	.9751	.9878	.9875
15	.9604	.9589	.9513	.9496	.9760	.9749
20	.9329	.9260	9135	.9054	.9598	.9559
25	.9236	.9074	.9134	.8944	.9369	.9259
30	.8811	.8443	.8709	.8204	.8907	.8745
35	.8180	.7948	.8091	.7800	.8230	.8100
40	.7236	.6954	.7154	.6705	.7196	.7155
45	.5917	.5856	.5763	.5570	.5912	.6056
50	.4555	.4573	.4436	.4240	.4469	.4753
55	.3146	.3368	.2929	.2952	.3176	.3751

Table VII-B12b: Summary of female survivorship probabilities, l(25+N)/l(25), at the national level by ethnicity in 2007 and for a 2001 HC: Rural sector

Age (N)	Total population		Fijians		Indians	
	2007	2001HC	2007	2001HC	2007	2001HC
10	.9742	.9737	9690	.9685	.9881	9880
15	.9526	.9495	.9403	.9367	.9786	9779
20	.9217	.9110	.8947	.8825	.9622	9593
25	.9183	.8943	.9091	.8793	.9327	9259
30	.8748	.8244	.8681	.7948	.8823	8729
35	.8101	.7780	.8037	.7635	.8110	8042
40	.7122	.6690	.7061	.6391	.7043	7078
45	.5822	.5657	.5710	.5403	.5781	5994
50	.4452	.4324	.4341	.3949	.4365	4700
55	.2979	.3108	.2784	.2708	.3110	3793

Table VII-B12c: Summary of female survivorship probabilities, l(25+N)/l(25), at the national level by ethnicity in 2007 and for a 2001 HC: Urban sector

Age (N)	Total population		Fijians		Indians	
	2007	2001HC	2007	2001HC	2007	2001HC
10	.9855	.9860	.9843	.9847	.9875	.9875
15	.9684	.9689	.9653	.9661	.9738	.9732
20	.9424	.9399	.9314	.9296	.9575	.9542
25	.9275	.9202	.9172	.9139	.9393	.9299
30	.8860	.8619	.8738	.8471	.8958	.8804
35	.8251	.8111	.8153	.8016	.8308	.8234
40	.7338	.7188	.7260	.7058	.7305	.7333
45	.6012	.6047	.5826	.5782	.6011	.6245
50	.4656	.4801	.4561	.4599	.4535	.4943
55	.3308	.3611	.3127	.3280	.3221	.3801

2.4 Estimation of male adult mortality

2.4.1. Basic data

TableVII-B13 presents the proportions of respondents with father still alive at the time of the 1996 and 2007 censuses.

Table VII-B13: Proportions of 1996 and 2007 Census respondents with father still alive at the national and provincial level by ethnicity

Province	Total population		Fijians		Indians	
	1996	2007	1996	2007	1996	2007
Fiji	**.6979**	**.6690**	**.7139**	**.6867**	**.6786**	**.6396**
Ba	.6937	.6931	.7112	.7221	.6832	.6689
Nadroga/Navosa	.6911	.6408	.6920	.6460	.6905	.6318
Ra	.6949	.6513	.7046	.6717	.6806	.6035
Naitasiri	.7053	.6717	.7282	.6964	.6680	.6294
Rewa	.6970	.6694	.7152	.6844	.6537	.6184
Tailevu	.6908	.6634	.7000	.6787	.6703	.6167
Namosi	.7229	.6712	.7227	.6698	.7470	.6965
Serua	.6881	.6617	.7107	.6872	.6605	.6194
Bua	.7085	.6427	.7131	.6401	.6865	.6464
Cakaudrove	.7157	.6780	.7252	.6913	.6967	.6472
Macuata	.6959	.6335	.7248	.6829	.6847	.5988
Kadavu	.6896	.5940	.6907	.5944	*	*
Lau	.7047	.6547	.7086	.6533	*	*
Lomaiviti	.7122	.6658	.7159	.6674	.6511	*
Rotuma	.6331	.6174	*	*	*	*

The data in this table suggests that, as in the case of female adult mortality, male adult mortality is also on the increase. Moreover, it confirms again that male adult mortality is significantly higher than female adult mortality, especially in the case of the Indians.

Table VII-B14 presents the national average proportions of respondents with father alive at the time of the 1996 and 2007 Censuses by five-year age group of respondents. The proportions for the 2001 HC have again been added.

Table VII-B14a: Proportions of 1996 and 2007 Census respondents in five-year age groups with father still alive at the national level, by ethnicity as well as these proportions for the 2001 HC: All sectors

Age Group	Total population			Fijians			Indians		
	1996	2007	2001HC	1996	2007	2001HC	1996	2007	2001HC
0-4	.9872	.9891	**.9891**	.9870	.9874	**.9874**	.9873	9928	**.9928**
5-9	.9774	.9726	**.9726**	.9755	.9684	**.9684**	.9800	.9819	**.9819**
10-14	.9560	.9442	**.9460**	.9560	.9367	**.9371**	.9557	.9553	**.9606**
15-19	.9132	.9037	**.8993**	.9176	.8936	**.8871**	.9074	.9185	**.9203**
20-24	.8422	.8557	**.8467**	.8539	.8539	**.8370**	.8261	.8564	**.8608**
25-29	.7343	.7668	**.7551**	.7543	.7686	**.7430**	.7066	.7628	**.7736**
30-34	.6133	.6566	**.6601**	.6454	.6600	**.6469**	.5764	.6474	**.6747**
35-39	.4807	.5281	**.5431**	.5100	.5295	**.5216**	.4480	.5194	**.5686**
40-44	.3571	.3854	**.4148**	.3666	.3821	**.3831**	.3410	.3816	**.4467**
45-49	.2379	.2814	**.3179**	.2298	.2718	**.2780**	.2392	.2859	**.3629**
50-54	.1454	.1964	**.2281**	.1293	.1781	**.1861**	.1586	.2105	**.2757**
55-59	.0804	.1517	**.2027**	.0674	.1313	**.1588**	.0950	.1704	**.2586**
60-64	.0397	.1523	**.2389**	.0318	.1401	**.2016**	.0511	.1661	**.2888**
65-69	.0271	.1245	**.3139**	.0226	.1058	**.2494**	.0316	.1506	**.4098**
70-74	.0189			.0234	.0702	**.4457**	.0224	.1079	**.6103**
75+	.0278								
Total	**.6979**	**.6690**		**.7139**	**.6867**		**.6884**	**.6539**	

Table VII-B14b: Proportions of 1996 and 2007 Census respondents in five-year age groups with father still alive at the national level, by ethnicity as well as these proportions for the 2001 HC: Rural sector

Age Group	Total population			Fijians			Indians		
	1996	2007	2001HC	1996	2007	2001HC	1996	2007	2001HC
0-4	.9878	.9887	**.9887**	.9876	.9873	**.9873**	.9883	.9928	**.9928**
5-9	.9776	.9676	**.9676**	.9752	.9630	**.9630**	.9819	.9827	**.9827**
10-14	.9576	.9385	**.9393**	.9565	.9291	**.9287**	.9582	.9596	**.9639**
15-19	.9143	.9033	**.8941**	.9155	.8881	**.8770**	.9136	.9293	**.9300**
20-24	.8429	.8567	**.8408**	.8478	.8524	**.8276**	.8378	.8632	**.8684**
25-29	.7343	.7633	**.7465**	.7492	.7595	**.7275**	.7151	.7705	**.7844**
30-34	.6174	.6526	**.6509**	.6420	.6518	**.6362**	.5886	.6531	**.6769**
35-39	.4822	.5170	**.5256**	.5054	.5140	**.4992**	.4567	.5214	**.5719**
40-44	.3516	.3802	**.4008**	.3569	.3731	**.3698**	.3427	.3895	**.4480**
45-49	.2310	.2744	**.2991**	.2220	.2601	**.2569**	.2396	.2951	**.3696**
50-54	.1413	.1821	**.2076**	.1221	.1621	**.1680**	.1632	.2112	**.2760**
55-59	.0755	.1328	**.1720**	.0623	.1105	**.1279**	.0947	.1683	**.2595**
60-64	.0336	.1299	**.1910**	.0265	.1145	**.1575**	.0475	.1575	**.2664**
65-69	.0221	.1055	**.2402**	.0188	.0861	**.1766**	.0286	.1461	**.4003**
70-74	.0205	.0668	**.3793**	.0205	.0499	**.2969**	.0195	.1066	**.5981**
75+									
Total	**.6982**	**.6613**		**.7054**	**.6714**		**.6898**	**.6418**	

Table VII-B14c: Proportions of 1996 and 2007 Census respondents in five-year age groups with father still alive at the national level, by ethnicity as well as these proportions for a 2001 HC: Urban sector

Age Group	Total population			Fijians			Indians		
	1996	2007	2001HC	1996	2007	2001HC	1996	2007	2001HC
0-4	.9865	.9896	**.9896**	.9860	.9876	**.9876**	.9862	.9927	**.9927**
5-9	.9772	.9784	**.9784**	.9760	.9764	**.9764**	.9778	.9813	**.9813**
10-14	.9547	.9506	**.9536**	.9552	.9476	**.9492**	.9529	.9516	**.9580**
15-19	.9120	.9041	**.9053**	.9200	.8989	**.8993**	.9013	.9094	**.9126**
20-24	.8416	.8549	**.8540**	.8602	.8552	**.8499**	.8161	.8521	**.8566**
25-29	.7343	.7696	**.7639**	.7605	.7783	**.7608**	.6985	.7579	**.7674**
30-34	.6088	.6601	**.6698**	.6498	.6698	**.6617**	.5640	.6435	**.6755**
35-39	.4791	.5384	**.5601**	.5162	.5479	**.5481**	.4397	.5179	**.5690**
40-44	.3628	.3907	**.4298**	.3797	.3936	**.4008**	.3395	.3750	**.4491**
45-49	.2452	.2881	**.3368**	.2403	.2870	**.3047**	.2387	.2786	**.3605**
50-54	.1502	.2099	**.2487**	.1401	.1987	**.2098**	.1539	.2099	**.2777**
55-59	.0869	.1703	**.2338**	.0765	.1605	**.2035**	.0954	.1721	**.2598**
60-64	.0484	.1763	**.2919**	.0424	.1788	**.2677**	.0549	.1730	**.3122**
65-69	.0351	.1474	**.3967**	.0310	.1405	**.3738**	.0349	.1545	**.4208**
70-74	.0286	.1086	**.6553**	.0308	.1093	**.6901**	.0254	.1091	**.6205**
75+									
Total	**.6975**	**.6765**		**.7260**	**.7059**		**.6671**	**.6379**	

2.4.2 Male survivorship probabilities

As in the case of females, male adult mortality is estimated:

- From 2007 Census data concerning paternal orphanhood
- For a 1996-2007 intercensal hypothetical cohort (2001 HC)

Proportions of respondents with surviving father have been converted into male lifetable probabilities of dying from age 32.5 to age 35 + N:

l(35+N) / l(32.5)

The conversion is made for N = 10, 15, 20…….55.[53]

The male survival probabilities at the national level by ethnicity and geographic sector have been summarized in Table VII-B15a-c.

Table VII-B15a: Summary of male survivorship probabilities, l(35+N)/l(32.5), at the national level by ethnicity in 2007 and for a 2001 HC: All sectors combined

Age (N)	Total population		Fijians		Indians	
	2007	2001HC	2007	2001HC	2007	2001HC
10	.9548	.9556	.9496	.9494	.9635	.9669
15	.9203	.9176	.9133	.9090	.9302	.9323
20	.8740	.8655	.8714	.8579	.8727	.8750
25	.7955	.7818	.8019	.7775	.7783	.7855
30	.6709	.6694	6827	.6640	.6438	.6684
35	.5178	.5299	.5295	.5176	.4873	.5378
40	.3263	.3572	.3341	.3330	.3009	.3714
45	.2105	.2488	.2052	.2113	.2057	.2900
50	.1283	.1538	.1088	.1158	.1404	.1926
55	.1170	.1825	.0971	.1385	.1357	.2434

[53] For this conversion, the mean age of fathers at the time of birth of their children, $\overline{M}^{Fa}$ is required. In Fiji, this index cannot be obtained from census information in the same way as $\overline{M}^{Mo}$. Fijian society is monogamous. $\overline{M}^{Fa}$ can therefore probably be approximated by adding the difference between the mean age at marriage of males and females to the estimate of $\overline{M}^{Mo}$. In Chapter III, the Singulate Mean Age at Marriage (SMAM) for males and females has been estimated from the proportions of single males and females using a method devised by Hajnal. Estimates of $\overline{M}^{Fa}$ for the total population by ethnicity and geographic sector derived from 2007 Census data and for the 2001 HC have been estimated as follows:

Ethnic Group	All Sectors		Rural		Urban	
	2007 C	HC 2001*	2007 C	HC 2001*	2007 C	HC 2001*
Total Population	30.8	30.6	31.0	30.8	30.6	30.4
Fijians	31.3	31.1	31.4	31.2	31.0	30.8
Indians	29.8	29.6	29.6	29.4	29.9	29.7

Note * The indices for the HC 2001 have been obtained by means of interpolation between the 1996 and 2007 indices.

Table VII-B15b: Summary of male survivorship probabilities, l(35+N)/l(32.5, at the national level by ethnicity in 2007 and for a 2001 HC: Rural sector

Age (N)	Total population		Fijians		Indians	
	2007	2001HC	2007	2001HC	2007	2001HC
10	.9498	.9499	.9431	.9425	.9664	.9695
15	.9184	.9127	.9072	.9001	.9383	.9402
20	.8756	.8612	.8686	.8488	.8790	.8831
25	.7965	.7769	.7969	.7654	.7832	.7959
30	.6705	.6633	.6760	.6539	.6456	.6700
35	.5106	.5156	.5162	.4970	.4833	.5415
40	.3284	.3492	.3297	.3253	.3080	.3714
45	.2055	.2297	.1936	.1869	.2131	.3014
50	.1105	.1343	.0910	.1012	.1311	.1868
55	.0954	.1443	.0733	.0982	.1302	.2449

Table VII-B15c: Summary of male survivorship probabilities, l(35+N)/l(32.5), at the national level by ethnicity in 2007 and for a 2001 HC: Urban sector

Age (N)	Total population		Fijians		Indians	
	2007	2001HC	2007	2001HC	2007	2001HC
10	.9606	.9623	.9588	.9583	.9610	.9650
15	.9223	.9233	.9198	.9170	.9232	.9266
20	.8725	.8711	.8730	.8652	.9678	.8707
25	.7944	.7872	.8056	.7809	.7748	.7809
30	.6708	.6760	.6873	.6650	.6418	.6711
35	.5247	.5441	.5422	.5279	.4889	.5402
40	.3244	.3668	.3352	.3244	.2936	.3770
45	.2149	.2676	.2175	.2302	.1994	.2848
50	.1452	.1736	.1303	.1265	.1471	.1998
55	.1388	.2217	.1315	.1983	.1395	.2441

3. Generation of two-parameter logit life tables

From the patchy information on early childhood mortality and adult mortality obtained in the previous sections of this chapter, a lifetable cannot be constructed in the conventional manner. This can only be done indirectly. This section briefly refers to the methodology of generating a lifetable from the results obtained in Section 1 and 2. It then proceeds with the generation of lifetables at the national and provincial level.

3.1 Methodology[54]

Several techniques have been devised for the generation of a lifetable from the fragmentary information obtained in Section 1 and 2. A convenient technique (which has been used in the mortality analysis of all censuses in Fiji since 1976), entails the splicing together of the early childhood mortality estimates (in Section 1) with the adult mortality probabilities (in Section 2). During this process, a mortality slope (β) and a mortality level (α) are estimated that best fit the early childhood and adult mortality probabilities. The iterative or "homing-in" procedure, devised by Brass and Hill, has again been selected for the present analysis.[55]Once these two parameters (β and α) for a particular population are known, a two-parameter lifetable for this population can be generated.

3.2. Abridged lifetables at the national level

3.2.1. Females

Table VII-B16 provides the input data with regard to:

- Early childhood mortality

  This is the fitted l_2 value for females obtained in Section 1

- Adult mortality

  This is the series of adult mortality probabilities l(25+N/l(25) for females obtained in Section 2

Table VII-B16 also shows the **α** and **β** values resulting from the iteration process.

Two-parameter logit lifetables for females at the national level by ethnicity and geographic sector can now be generated using a standard model lifetable. Since the 1976 Census, the FBoS has used Brass' general purpose standard table (GSPT). The generated l_x function of abridged lifetables (for x = 0, 1, 5, 10, 15….85) by ethnicity and geographic sector are presented in Table VII-B17.

[54] The methodology has once again been detailed in the forthcoming FBoS Research Monograph on Mortality (Bakker, 2013)

[55]Brass, W. and K. H. Hill. 1973:111-123.

Table VII-B16: Input and output data for two-parameter female lifetables by ethnicity and geographic sector

(1) Based on 2007 Census data

Index	Total Population			Fijians			Indians		
	All	Rur.	Urb.	All	Rur.	Urb.	All	Rur.	Urb.
Input									
l(2)[a]	.976	.977	.974	.977	.977	.976	.975	.977	.973
lnit. l(25)	.9436	.9436	.9436	.9436	.9436	.9436	.9436	.9436	.9436
l(35)/l(25)	.9794	.9742	.9855	.9752	.9690	.9843	.9878	.9881	.9875
l(40)/l(25)	.9604	.9526	.9684	.9513	.9403	.9653	.9760	.9786	.9738
l(45)/l(25)	9329	.9217	.9424	.9135	.8947	.9314	.9598	.9622	.9575
l(50)/l(25)	.9236	.9183	.9275	.9134	.9091	.9172	.9369	.9327	.9393
l(55)/l(25)	.8811	.8748	.8860	.8709	.8681	.8738	.8907	.8823	.8958
l(60)/l(25)	.8189	.8101	.8251	.8091	.8037	.8153	.8230	.8110	.8308
l(65)/l(25)	.7235	.7122	.7338	.7154	.7061	.7260	.7196	.7043	.7305
l(70)/l(25)	.5918	.5822	.6012	.5763	.5710	.5826	.5912	.5781	.6011
l(75)/l(25)	.4555	.4452	.4656	.4436	.4341	.4561	.4469	.4365	.4535
l(80)/l(25)	.3146	.2979	.3308	.2929	.2784	.3127	.3176	.3110	.3221
Output									
α	-.893	-.873	-.902	-.859	-.833	-.880	-.934	-.932	-.930
β	1.342	1.400	1.272	1.420	1.456	1.360	1.266	1.318	1.206

Note * l(25) = 0.6826: logit l(25) = -0.3829

(2) For 2001 HC

Index	Total Population			Fijians			Indians		
	All	Rur.	Urb.	All	Rur	Urb.	All	Rur.	Urb.
Input*									
l(2)[a]	.976	.977	.974	.977	.977	.976	.975	.977	.973
lnit. l(25)	.9436	.9437	.9415	.9430	.9417	.9428	.9442	.9436	.9436
l(35)/l(25)	.9794	.9737	.9860	.9751	.9685	.9847	.9875	.9880	.9875
l(40)/l(25)	.9589	.9495	.9689	.9496	.9367	.9661	.9749	.9779	.9732
l(45)/l(25)	.9260	.9110	.9399	.9054	.8825	.9296	.9559	.9593	.9542
l(50)/l(25)	.9074	.8943	.9202	.8944	.8793	.9139	.9259	.9259	.9299
l(55)/l(25)	.8443	.8244	.8619	.8204	.7948	.8471	.8745	.8729	.8804
l(60)/l(25)	.7948	.7780	.8111	.7800	.7635	.8016	.8100	.8042	.8234
l(65)/l(25)	.6954	.6690	.7188	.6705	.6391	.7058	.7155	.7078	.7333
l(70)/l(25)	.5856	.5657	.6047	.5570	.5403	.5782	.6056	.5994	.6245
l(75)/l(25)	.4573	.4324	.4801	.4240	.3949	.4599	.4753	.4700	.4943
l(80)/l(25)	.3368	.3108	.3611	.2952	.2708	.3280	.3751	.3793	.3801
Output									
α	-.837	-.795	-.871	-.788	-.733	-.850	-.906	-.919	-.933
β	1.420	1.509	1.316	1.519	1.596	1.402	1.294	1.335	1.286

Note * l(25) = 0.6826: logit l(25) = -0.3829

Table VII-B17: Generated l(x) values of two-parameter lifetables for females at the national level by ethnicity and geographic sector based on 2007 Census data

Index	Total Population			Fijians			Indians		
	All	Rural	Urban	All	Rural	Urban	All	Rural	Urban
α	-.893	-.873	-.902	-.859	-.833	-.880	-.934	-.932	-.930
β	1.342	1.400	1.272	1.420	1.456	1.360	1.266	1.318	1.206
Output: Female lifetable function l(x) for x = 1, 5, 10, 15……85									
0	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
1	98,391	98,484	98,218	98,494	98,509	98,399	98,310	98,477	98,113
5	96,772	96,864	96,558	96,852	96,825	96,758	96,742	96,922	96,480
10	96,309	96,393	96,094	96,372	96,328	96,287	96,303	96,488	96,031
15	95,942	96,018	95,728	95,989	95,931	95,913	95,958	96,145	95,679
20	95,291	95,348	95,082	95,305	95,218	95,248	95,348	95,537	95,063
25	94,341	94,365	94,148	94,297	94,164	94,276	94,467	94,651	94,178
30	93,286	93,264	93,121	93,167	92,978	93,194	93,496	93,669	93,212
35	92,099	92,019	91,975	91,885	91,628	91,975	92,414	92,567	92,144
40	90,667	90,506	90,604	90,326	89,981	90,501	91,117	91,237	90,873
45	88,835	88,559	88,864	88,316	87,852	88,614	89,470	89,537	89,272
50	86,329	85,880	86,506	85,548	84,912	86,029	87,233	87,213	87,115
55	82,674	81,951	83,094	81,483	80,592	82,255	83,988	83,817	84,015
60	77,248	76,097	78,070	75,429	74,163	76,653	79,188	78,759	79,470
65	68,580	66,755	70,078	65,794	63,995	67,723	71,494	70,611	72,241
70	55,588	52,921	58,027	51,642	49,295	54,426	59,746	58,185	61,223
75	36,776	33,572	40,073	32,188	29,743	35,456	41,873	39,599	44,228
80	17,274	14,790	20,206	13,834	12,227	16,284	21,510	19,335	24,002
85	5,089	4,033	6,525	3,670	3,089	4,675	7,064	5,933	8,516

Next, these l(x) values have been entered into the LIFTB programme of MORTPAK and abridged lifetables for females have been generated by ethnicity and geographic sector. Some of the key indices of these lifetables are presented in Table VII-B18.

Table VII-B18: Key indices of two-parameter lifetables for females by ethnicity and geographic sector estimated from 2007 Census data

Index	Total Population			Fijians			Indians		
	All	Rur	Urb	All	Rur	Urb	All	Rur	Urb
IMR (‰)	16	15	18	15	15	15	17	16	19
U5MR (‰)	32	31	34	32	32	33	33	31	35
e_0 (yrs)	66.2	65.5	66.8	65.1	64.4	65.8	67.4	67.0	67.7
e_5 (yrs)	63.3	62.5	64.1	62.2	61.5	63.0	64.6	64.1	65.2
e_{25} (yrs)	44.7	43.8	45.4	43.5	42.9	44.3	45.9	45.4	46.5
e_{65} (yrs)	10.9	10.4	11.4	10.2	9.8	10.7	11.7	11.2	12.1
e_{85} (yrs)	2.8	2.7	2.9	2.6	2.6	2.7	2.9	2.8	3.1
CDR (‰)	9	10	8	9	11	8	8	9	8
d (‰)	15	15	15	15	16	15	15	15	15

The IMR, U5MR and life expectancies at various ages can be read directly from these lifetables. The Crude Death Rate (CDR) is not a lifetable function but the CDRs in Table VII-B18 have been calculated by applying the ASDRs of these lifetables to the 2007 Census age-structures for females. The CDRs in Table VII-B18 have not been standardized and are therefore not comparable.

Furthermore, the intrinsic death rate (d) is defined as the death rate that the population would eventually attain if the population would become stationary given the mortality and fertility conditions of the relevant lifetable. These d values are therefore comparable.

3.2.2. Males

Table VII-B19 provides the early childhood and adult mortality data for males that has been used to calculate the α and β values for male lifetables:

- Early childhood mortality

  This is the fitted l_2 value for males obtained in Section 1

- Adult mortality

  This is the series of adult mortality probabilities l(35+N/l(32.5+) for males obtained in Section 2

Table VII-B19 also shows the α and β values resulting from the iteration process.

Two-parameter logit lifetables for males at the national level can now be generated. The same GSPT as used in the case of female lifetable generation has again been used for male lifetable generation. The generated l_x function of abridged lifetables (for x = 0, 1, 5, 10, 15….85) by ethnicity and geographic sector are presented in Table VII-B20.

Table VII-B21 provides a summary of input and output data of two-parameter male lifetables for Fiji by ethnicity and geographic sector.

Table VII-B19: Input and output data of two-parameter male lifetables for Fiji by ethnicity and geographic sector

(1) Based on 2007 Census data

Index	Total Population			Fijians			Indians		
	All	Rur.	Urb.	All	Rur.	Urb.	All	Rur.	Urb.
Input*									
l(2)[a]	.972	.971	.974	.972	.971	.972	.974	.972	.976
lnit. l(32.5)	.9264	.9264	.9264	.9264	.9264	.9264	.9264	.9264	.9264
l(45)/l(32.5)	.9548	.9498	.9606	.9496	.9431	.9588	.9635	.9664	.9610
l(50)/l(32.5)	.9203	.9184	.9223	.9133	.9072	.9198	.9302	.9383	.9232
l(55)/l(32.5)	.8740	.8756	.8725	.8714	.8686	.8730	.8727	.8790	.9678
l(60)/l(32.5)	.7955	.7965	.7944	.8019	.7969	.8056	.7783	.7832	.7748
l(65)/l(32.5)	.6709	.6705	.6708	.6827	.6760	.6873	.6438	.6456	.6418
l(70)/l(32.5)	.5178	.5106	.5247	.5295	.5162	.5422	.4873	.4833	.4889
l(75)/l(32.5)	.3263	.3284	.3244	.3341	.3297	.3352	.3009	.3080	.2936
l(80)/l(32.5)	.2105	.2055	.2149	.2052	.1936	.2175	.2057	.2131	.1994
l(85)/l(32.5)	.1283	.1105	.1452	.1088	.0910	.1303	.1404	.1311	.1471
l(90)/l(32.5)	.1170	.0954	.1388	.0971	.0733	.1315	.1357	.1302	.1395
Output									
α	-.792	-.783	-.812	-.799	-.779	-.807	-.787	-.776	-.780
β	1.371	1.360	1.397	1.363	1.364	1.352	1.432	1.395	1.470

Note * l(32.5) = 0.6375: logit l(32.5) = -0.2824

(2) For 2001 HC

Index	Total Population			Fijians			Indians		
	All	Rur.	Urb.	All	Rur.	Urb.	All	Rur.	Urb.
Input*									
l(2)[a]	.972	.971	.974	.972	.971	.972	.974	.972	.976
lnit. l(32.5)	.9264	.9264	.9264	.9264	.9264	.9264	.9264	.9264	.9264
l(45)/l(32.5)	.9556	.9499	.9623	.9494	.9425	.9583	.9669	.9695	.9650
l(50)/l(32.5)	.9176	.9127	.9233	.9090	.9001	.9170	.9323	.9402	.9266
l(55)/l(32.5)	.8655	.8612	.8711	.8579	.8488	.8652	.8750	.8831	.8707
l(60)/l(32.5)	.7818	.7769	.7872	.7775	.7654	.7809	.7855	.7959	.7809
l(65)/l(32.5)	.6694	.6633	.6760	.6640	.6539	.6650	.6684	.6700	.6711
l(70)/l(32.5)	.5299	.5156	.5441	.5176	.4970	.5279	.5378	.5415	.5402
l(75)/l(32.5)	.3572	.3492	.3668	.3330	.3253	.3244	.3714	.3714	.3770
l(80)/l(32.5)	.2488	.2297	.2676	.2113	.1869	.2302	.2900	.3014	.2848
l(85)/l(32.5)	.1538	.1343	.1736	.1158	.1012	.1265	.1926	.1868	.1998
l(90)/l(32.5)	.1825	.1443	.2217	.1385	.0982	.1983	.2434	.2449	.2441
Output									
α	-.798	-.777	-.831	-.779	-.750	-.788	-.833	-.825	-.851
β	1.363	1.368	1.372	1.391	1.406	1.379	1.368	1.327	1.401

Note * l(32.5) = 0.6375: logit l(32.5) = -0.2824

Table VII-B20: Generated l(x) values of two-parameter logit lifetables for males at the national level by ethnicity and geographic sector

Index	Total Population			Fijians			Indians		
	All	Rural	Urban	All	Rural	Urban	All	Rural	Urban
α	-.792	-.783	-.812	-.799	-.779	-.807	-.787	-.776	-.780
β	1.371	1.360	1.397	1.363	1.364	1.352	1.432	1.395	1.470
Output: Female lifetable function l(x) for x = 1, 5, 10, 15……85									
0	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000	100,000
1	98,132	98,063	98,282	98,132	98,061	98,126	98,299	98,149	98,384
5	96,207	96,091	96,459	96,223	96,079	96,233	96,432	96,195	96,539
10	95,654	95,527	95,931	95,676	95,512	95,692	95,885	95,631	95,994
15	95,216	95,081	95,511	95,243	95,063	95,264	95,450	95,183	95,558
20	94,437	94,288	94,763	94,473	94,265	94,504	94,672	94,384	94,775
25	96,601	93,134	93,666	93,350	93,103	93,397	93,527	93,216	93,618
30	92,040	91,855	92,443	92,105	91,814	92,171	92,245	91,915	92,316
35	90,623	90,421	91,063	90,707	90,369	90,796	90,795	90,451	90,836
40	88,916	88,698	89,394	89,025	88,632	89,142	89,036	88,685	89,034
45	86,741	86,505	87,256	86,881	86,421	87,036	86,776	86,429	86,709
50	83,782	83,530	84,333	83,967	83,420	84,175	83,681	83,357	83,512
55	79,509	79,244	80,084	79,757	79,101	80,044	79,178	78,916	78,841
60	73,266	73,003	73,832	73,605	72,812	74,004	72,563	72,434	71,962
65	63,572	63,346	64,046	64,034	63,090	64,590	62,273	62,407	61,270
70	49,718	49,580	49,961	50,300	49,271	51,020	47,695	48,220	46,245
75	31,128	31,151	31,019	31,729	30,832	32,494	28,701	29,572	27,094
80	13,696	13,809	13,404	14,103	13,596	14,638	11,887	12,645	10,793
85	3,807	3,883	3,623	3,964	3,802	4,177	3,066	3,403	2,657

Some of the key indices of these lifetables are presented in Table VII-B21.

Table VII-B21: Key indices of two-parameter lifetables for males by ethnicity and geographic sector estimated from 2007 Census data

Index	Total Population			Fijians			Indians		
	All	Rur	Urb	All	Rur	Urb	All	Rur	Urb
IMR (‰)	19	19	17	19	19	19	17	19	16
U5MR (‰)	38	39	36	38	39	38	36	38	35
e_0 (yrs)	64.1	64.0	64.3	64.2	63.8	64.5	63.7	63.6	63.4
e_5 (yrs)	61.5	61.5	61.6	61.7	61.4	61.9	61.0	61.6	60.6
e_{25} (yrs)	43.1	43.1	43.1	43.3	43.0	43.5	42.5	42.7	42.1
e_{65} (yrs)	10.2	10.3	10.1	10.3	10.2	10.5	9.8	10.0	9.5
e_{85} (yrs)	2.7	2.7	2.6	2.7	2.7	2.7	2.6	2.7	2.5
CDR (‰)	9	10	8	9	10	8	10	10	9
d (‰)	16	16	16	16	16	16	16	16	16

3.3. Abridged lifetables at the provincial level

The l(x) values of the provincial lifetables for females estimated from 2007 Census data are shown in Table VII-B22 and those for males in Table VII-B23.

Table VII-B22: Generated l(x) values of female lifetables for the provinces: 2007 Census

Index	Fiji	Western Div			Central Division				
		Ba	Nadro	Ra	Naitas	Rewa	Tailevu	Namosi*	Serua
Input: β = 1.342; logit l(2)^s = -0.7152									
l(2)^a	.976	.974	.979	.979	.976	.975	.979	.976	.981
logit l(2)^a	-1.8527	-1.8117	-1.9210	-1.9210	-1.8527	-1.8318	-1.9210	-1.8527	-1.9721
A	-.893	-.852	-.961	-.961	-.893	-.872	-.961	-.893	-1.012
Output: Female lifetable function l(x) for x = 1, 5, 10, 15……85; l(0) = 100,000									
1	98,391	98,255	98,592	98,592	98,391	98,323	98,592	983,91	98,727
5	96,772	96,506	97,171	97,171	96,772	96,638	97,171	96,772	97,438
10	96,309	96,006	96,763	96,763	96,309	96,157	96,763	96,309	97,068
15	95,942	95,611	96,440	96,440	95,942	95,776	96,440	95,942	96,774
20	95,291	94,909	95,865	95,865	95,291	95,099	95,865	95,291	96,251
25	94,341	93,887	95,025	95,025	94,341	94,113	95,025	94,341	95,486
30	93,286	92,754	94,089	94,089	93,286	93,018	94,089	93,286	94,632
35	92,099	91,482	93,034	93,034	92,099	91,788	93,034	92,099	93,667
40	90,667	89,950	91,756	91,756	90,667	90,306	91,756	90,667	92,496
45	88,835	87,995	90,114	90,114	88,835	88,412	90,114	88,835	90,987
50	86,329	85,332	87,856	87,856	86,329	85,826	87,856	86,329	88,903
55	82,674	81,468	84,536	84,536	82,674	82,064	84,536	82,674	85,823
60	77,248	75,775	79,549	79,549	77,248	76,501	79,549	77,248	81,159
65	68,580	66,787	71,434	71,434	68,580	67,668	71,434	68,580	73,469
70	55,588	53,555	58,915	58,915	55,588	54,549	58,915	55,588	42,464
75	36,776	34,891	39,991	39,991	36,776	35,805	39,991	36,776	42,462
80	17,274	16,134	19,305	19,305	17,274	16,682	19,305	17,274	20,944
85	5,089	4,708	5,788	5,788	5,089	4,890	5,788	5,089	6,370

Index	Fiji	Northern Division			Eastern Division				Notes
		Bua	Cakau	Macua	Kadavu	Lomai	Lau	Rotuma	
Input: β = 1.342; logit l(2)^s = -0.7152									
l(2)^a	.976	.971	.980	.975	.979	.980	.983	.966	
logit l(2)^a	-1.8527	-.7555	-1.9459	-1.8318	-1.9210	-1.9459	-2.0287	-1.6734	
A	-.893	-.867	-.986	-.872	-.961	-.986	-1.069	-.714	
Output: Female lifetable function l(x) for x = 1, 5, 10, 15……8; l(0) = 100,000									
1	98,391	98,306	98,660	98,323	98,592	98,660	98,863	97,714	
5	96,772	96,605	97,305	96,638	97,171	97,305	97,708	95,445	
10	96,309	96,120	96,916	96,157	96,763	96,916	97,375	94,803	
15	95,942	95,735	96,608	95,776	96,440	96,608	97,112	94,295	
20	95,291	95,052	96,059	95,099	95,865	96,059	96,641	93,398	
25	94,341	94,057	95,256	94,113	95,025	95,256	95,952	92,098	
30	93,286	92,953	94,361	93,018	94,089	94,361	95,182	90,666	
35	92,099	91,713	93,351	91,788	93,034	93,361	94,310	89,070	
40	90,667	90,218	92,127	90,306	91,756	92,127	93,250	87,166	
45	88,835	88,309	90,551	88,412	90,114	90,551	91,879	84,761	
50	86,329	85,704	88,380	85,826	87,856	88,380	89,979	81,531	
55	82,674	81,916	85,179	82,064	84,536	85,179	87,155	76,936	
60	77,248	76,321	80,351	76,501	79,549	80,351	82,840	70,357	
65	68,580	67,449	72,444	67,668	71,434	72,444	75,631	60,410	
70	55,588	54,301	60,120	54,549	58,915	60,120	64,025	46,666	
75	36,776	35,576	41,197	35,805	39,991	41,197	45,268	28,908	
80	17,274	16,544	20,096	16,682	19,305	20,096	22,894	12,738	
85	5,089	4,844	6,067	4,890	5,788	6,067	7,085	3,613	

Table VII-B23: Generated l(x) values of male lifetables for the provinces: 2007 Census

Index	Fiji	Western Div			Central Division				
		Ba	Nadro	Ra	Naitas	Rewa	Tailevu	Namosi*	Serua
Input: β = 1.371; logit l(2)^s = -0.7152									
l(2)^a	.972	.972	.973	.966	.974	.969	.976	.972	.976
logit l(2)^a	-1.7736	-1.7736	-1.7923	-1.6734	-1.8117	-1.7211	-1.8527	-1.7736	-1.8527
α	-.793	-.793	-.812	-.693	-.831	-.741	-.872	-.793	-.872
Output: Female lifetable function l(x) for x = 1, 5, 10, 15……85; l(0) = 100,000									
1	98,135	98,135	98,204	97,732	98,270	97,935	98,404	98,135	98,404
5	96,214	96,214	96,350	95,414	96,481	95,817	96,749	96,214	96,749
10	95,663	95,663	95,818	94,753	95,967	95,210	96,273	95,663	96,273
15	95,225	95,225	95,395	94,229	95,559	94,730	95,894	95,225	95,894
20	94,448	94,448	94,644	93,301	94,833	93,877	95,221	94,448	95,221
25	93,314	93,314	93,547	91,953	93,773	92,635	94,235	93,314	94,235
30	92,054	92,054	92,328	90,463	92,593	91,259	93,136	92,054	93,136
35	90,640	90,640	90,957	88,799	91,265	89,719	91,897	90,640	91,897
40	88,936	88,936	89,304	86,810	89,662	87,870	90,398	88,936	90,398
45	86,764	86,764	87,194	84,293	87,612	85,523	88,475	86,764	88,475
50	83,810	83,810	84,319	80,909	84,815	82,348	85,841	83,810	85,841
55	79,541	79,541	80,153	76,094	80,750	77,797	81,993	79,541	81,993
60	73,306	73,306	74,043	69,215	74,766	71,222	76,282	73,306	76,282
65	63,619	63,619	64,493	58,876	65,359	61,179	67,191	63,619	67,191
70	49,768	49,768	50,718	44,787	51,667	47,171	53,711	49,768	53,711
75	31,171	31,171	31,992	27,049	32,824	28,985	34,657	31,171	34,657
80	13,720	13,720	14,176	11,519	14,645	12,535	15,700	13,720	15,700
85	3,814	3,814	3,956	3,144	4,103	3,450	4,438	3,814	4,438

Index	Fiji	Northern Division			Eastern Division				Notes
		Bua	Cakau	Macua	Kadavu	Lomai	Lau	Rotuma	
Input: β = 1.371; logit l(2)^s = -0.7152									
l(2)^a	.972	.968	.975	.972	.977	.968	.977	.974	
logit l(2)^a	-1.7736	-1.7047	-1.8318	-1.7736	-1.8745	-1.7047	-1.8745	-1.8117	
α	-.793	-.724	-.851	-.793	-.894	-.724	-.894	-.831	
Output: Female lifetable function l(x) for x = 1, 5, 10, 15……8; l(0) = 100,000									
1	98,135	97,865	98,336	98,135	98,471	97,865	98,471	98,270	
5	96,214	95,678	96,615	96,214	96,885	95,678	96,885	96,481	
10	95,663	95,053	96,119	95,663	96,428	95,053	96,428	95,967	
15	95,225	94,557	95,726	95,225	96,064	94,557	96,064	95,559	
20	94,448	93,678	95,026	94,448	95,417	93,678	95,417	94,833	
25	93,314	92,400	94,002	93,314	96,649	92,400	94,469	93,773	
30	92,054	90,984	92,862	92,054	93,412	90,984	93,412	92,593	
35	90,640	87,401	91,578	90,640	92,218	89,401	92,218	91,265	
40	88,936	87,503	90,027	88,936	90,773	87,503	90,773	89,662	
45	86,764	85,097	88,040	86,764	88,916	85,097	88,916	87,612	
50	83,810	81,849	95,323	83,810	86367	81,849	86,367	84,815	
55	79,541	77,204	81,364	79,541	82,633	77,204	82,633	80,750	
60	73,306	70,520	75,513	73,306	77,068	70,520	77,068	74,766	
65	63,619	60,369	66,259	63,619	68,154	60,369	68,154	65,359	
70	49,768	46,324	52,665	49,768	54,803	46,324	54,803	51,667	
75	31,171	28,290	33,712	31,171	35,660	28,290	35,660	32,824	
80	13,720	12,166	15,152	13,720	16,291	12,166	16,291	14,645	
85	3,814	3,339	4,263	3,814	4,628	3,339	4,628	4,103	

PART C

PRESENT MORTALITY SITUATION AND RECENT TRENDS

A comparison of the results of the analysis of NHIS data in Part A and the analysis of lifetime fertility and maternal and paternal orphanhood data collected in censuses in Part B suggests that the NHIS-based indices may, in recent years have become more consistent than the once that haven indirectly estimated from census data. Moreover, contrary to the time reference of many of the census-based indices, the time reference of all NHIS-based indices is precise and unambiguous.

Consequently, in the assessment in Part C, it is assumed that it is likely that the recent NHIS-based indices present a somewhat more reliable picture of the mortality situation and especially mortality trends in Fiji since 1986. Unfortunately, so far, the NHIS has not produced any statistically valid indices at the sub-national level or for the geographic sectors.

Consequently, in the analysis in this section, the assessment of the mortality situation and trend at the national level is mainly based on the NHIS-based indices obtained in Part A, whereas the assessment of mortality at the provincial level and for the geographic sectors is necessarily entirely based on the indirectly obtained indices from the census in Part B.

- Section 1 presents a picture of the mortality situation and trend since 1986 at the national level, based on NHIS indices

- Section 2 includes for the first time, a comprehensive picture of differential mortality at the provincial level. This picture is entirely based on indices that have been estimated indirectly from census data.

- Section 3 briefly considers the pattern of mortality in Fiji

1. The mortality situation and trend at the national level since 1986

Table VII-C1 presents some key indices of mortality by sex and ethnicity, based on NHIS data since 1986. The indices in this table are centered on the census years 1986, 1996 and 2007. Furthermore, the results of the analysis of 2000-2002 NHIS data (centered on 2001) are also included. However, users are reminded again that 2001was not a census year and the denominators of the ASDRs from which the indices have been derived are projected denominators.

Furthermore, users should also keep in mind that the NHIS data remains affected by some under-registration. This means that the NHIS based indices most likely present a slightly too rosy picture of the mortality situation. In other words, all early childhood mortality estimates as well as the CDRs in Table VII-C1 should be considered as minimum estimates and all life expectancies as maximum estimates.

Table VII-C1: Comparison of key indices of mortality for the population by sex and ethnicity in 1986, 1996, 2001 and 2007

Mortality Index	Year	Total Population			Fijians			Indians		
		Total	Males	Fems	Total	Males	Fems	Total	Males	Fems
Infant Mortality Rate (IMR) (‰)	**1986**	22	24	20	26	27	25	19	22	16
	1996	21	21	22	25	25	26	18	18	19
	2001	20	20	20	23	23	24	17	18	16
	2007	20	21	19	21	22	20	21	23	19
Child Mortality Rate (CMR) (‰)	**1986**	5	5	5	6	7	6	4	4	4
	1996	5	5	5	6	6	6	4	3	4
	2001	4	4	5	6	6	6	3	3	4
	2007	7	7	6	8	7	8	5	6	4
Life expectancy at birth (e_0) (years)	**1986**	67.1	65.1	69.0	67.0	64.9	69.0	67.1	65.2	68.9
	1996	66.5	64.4	68.6	66.5	64.8	68.1	66.5	64.0	69.0
	2001	65.5	63.7	67.8	65.4	63.8	66.8	65.5	63.7	68.8
	2007	67.4	65.2	69.5	66.3	65.2	67.4	68.6	64.9	72.2
Life exp. at age 25 (e_{25}) (years)	**1986**	44.9	43.1	46.5	45.1	43.2	46.9	44.6	43.0	46.1
	1996	44.3	42.3	46.1	44.5	42.9	46.0	44.0	41.7	46.2
	2001	43.1	41.7	44.6	43.1	42.0	44.7	43.0	41.4	46.1
	2007	45.2	43.1	47.0	44.1	43.1	45.1	46.2	42.8	49.6
Life exp. at age 65 (e_{65}) (years)	**1996**	11.8	10.7	12.8	12.0	11.0	12.9	11.5	10.3	12.6
	2001	11.0	10.1	12.1	11.0	10.0	12.0	10.9	10.1	12.2
	2007	13.4	12.3	14.4	12.7	12.1	13.2	14.2	12.2	16.2
Crude Death Rate (CDR) (‰)	**1996**	6	7	5	6	7	6	6	7	5
	2001	7	8	6	7	8	7	7	8	5
	2007	8	8	7	8	8	7	8	9	6
Intrinsic Death Rate (d) (‰)	**1986**	14.9	15.4	14.5	14.9	15.4	14.5	14.9	15.3	14.5
	1996	15.0	15.5	14.5	15.0	15.4	14.6	15.0	15.6	14.5
	2001	15.3	15.7	14.7	15.3	15.7	15.0	15.3	15.7	14.5
	2007	14.8	15.3	14.4	15.1	15.3	14.8	14.6	15.4	13.9

Source: All indices in this table have been estimated from data on death by age, sex and ethnicity recorded by the NHIS.

1.1. Early childhood mortality

The conventional indices of early childhood mortality (under the age of five) are the infant mortality rate (IMR in the first year of life) and the child mortality rate (CMR in the subsequent four years of life). Both rates are expressed per thousand (‰). The following comments refer to IMRs and CMRs in Table VII-B1:[56]

- The two indices suggest that, compared to many developing countries, especially those in Tropical Africa, Fiji has reached a moderately low level of early childhood mortality.

- However, this level had already been achieved by 1986. In the 1950s, the IMR for Fijians as well as Indians was still close to 90 ‰. By the early 1970s, the IMR had dropped to a level below 50 ‰.[57] In 1986 the IMR for the total population had further

[56] In lifetable notation, the IMR is ${}_1q_0$ and the CMR (as used in this report) is ${}_4q_1$.
[57] Bakker, 2013 (forthcoming)

decreased to 22 ‰, that of Fijians to 26 ‰ and that of Indians to 19 ‰. It is clear that the infant mortality transition during the post-World War II decades until the mid-1980s was fast. However, judging from the indices in Table VII-C1, since the mid-1980s, the early childhood mortality transition appears to have stalled.

- Between 1986 and 2007, the IMR decreased only very marginally. In 1986, the IMR for Fijian children was somewhat higher than that for Indian children. However, in 2007, the difference between the two main ethnic components of the population has become negligible.

- With respect to infant mortality, it is important to note that nowadays, virtually all children in Fiji (more than 98 percent) are born in a hospital, Health Centre or Maternity unit with a doctor, registered nurse or midwife in attendance. As long as this remains the case, infant mortality will most likely not increase again to its pre-1986 level, unless health care for infants deteriorates drastically in the future. Another cause of future increase in early childhood mortality may be that the prevalence of mother-child transmission of HIV/AIDS increases significantly.

- During the period 1986-2007, the CMR for Fijian children increased whereas that of Indian children remained at about the same level. Interventions by the health authorities that address morbidity and mortality risks for children in the age group 1 to 4 appear to be less effective than those in the case of infant morbidity and mortality, especially in the case of Fijian children. One reason why the CMR of Fijian children is significantly higher than that of Indian children may be that Indian parents are mainly residing in urban areas or in areas not too far away from an urban center and connected with this center by road. On average, Indian parents therefore have easier access to the facilities of hospitals and health centers. An additional factor may be that, in case of illness of their children, Indian parents are more inclined to seek medical help in a hospital or health center than Fijian parents. Use of traditional medicine seems to be more common in the case of Fijian parents.

1.2. Adult mortality

Table VII-C1 compares the e_{25} and e_{65} values of the 2007 lifetables with those for 1986, 1996 and 2001.It appears that since 1986, the remaining number of years of life for those reaching the age of 25, has very marginally decreased for Fijian males and females as well as for Indian males. Only the Indian females have gained some extra years.

Generally, the lack of improvement in the e_{25} values suggests that, since 1986, the adult mortality transition has stagnated. The 2007 indices provide some evidence that adult mortality may have increased in recent times. Whatever the case may be, it is clear that the stagnation in the case of adult mortality is more serious than in the case of early childhood mortality. Comparison of the pre-1986 adult mortality indices with the early childhood mortality indices for that period suggests that the pre-1986 mortality transition for adults did not progress as fast as that for infants, especially in the case of the Fijians.[58]

At age 65, the situation seems slightly more promising. All component populations, but especially Indian females, have made some gains.

[58]Ibid

Another indication of stagnation and possible deterioration in the adult mortality situation is provided by recent census information regarding maternal and paternal orphanhood. The survival probabilities of mothers and fathers that underlie the adult mortality analysis in Part B, consistently indicate that the lack of progress in the adult mortality transition since the mid-1980s may be more severe than that suggested by the NHIS data. This is shown in Table VII-C2. The proportions of census respondents with surviving mother and father have, since 1986, decreased for all component populations. The loss seems to be most serious in the case of Indian males.

Table VII-C2: Proportions (%) of respondents by ethnicity reporting that their natural mother/father was still alive at the time of the 1976, 1986, 1996 and 2007 Censuses

Population	1976	1986	1996	2007
Survival of Mother (%)				
Tot. Pop.	80.5	81.0	79.3	76.1
Fijians	78.4	79.7	79.1	76.3
Indians	82.5	82.4	79.5	75.6
Survival of Father (%)				
Tot. Pop.	72.4	72.1	69.8	66.9
Fijians	70.9	72.2	71.4	68.7
Indians	73.9	72.2	67.9	64.0

Source Derived from maternal and paternal orphanhood data collected in the 1976, 1986, 1996 and 2007 Censuses.

With regard to the data in Table VII-C2, it is theoretically possible that, on average, the answers to maternal and paternal survival questions by census respondents during the subsequent censuses may not have been of the same quality. For instance, there is little doubt that the maternal and paternal orphanhood data in Fiji is affected by a certain amount of adoption bias. As mentioned, children who have been adopted are sometimes inclined to report the vital status of their foster mother/father instead of that of their natural mother/father. This is particularly so in the case of young respondents.[59] It is possible that the orphanhood data collected during the subsequent censuses is unequally affected by an adoption bias. For instance, the 2007 Census respondents may on average have been more inclined to report that their natural father/mother was dead than the respondents during previous censuses. However, this is very unlikely. Since none of the censuses was followed by a post-enumeration survey (PES) there is no hard evidence to suggest that the response to the orphanhood questions during subsequent censuses was indeed affected by differential response errors.[60]

[59]In Part B, it was stressed that in a census interview situation, the answers to the orphanhood questions (or any other question for that matter) for all households members (but particularly the young members) are often provided by one person. This person is most likely the head of household or his/her spouse. In other words much information is provided by proxy respondents.

[60] In this connection, it should be noted that the maternal orphanhood data is almost certainly more accurate than the paternal orphanhood data. Virtually everybody in Fiji knows his/her natural mother and whether or not this mother is still alive. There is more uncertainty with regard to natural fathers.

1.3. Overall mortality

Table VII-C1also includes the most important index of overall mortality: the average life expectancy at birth (e_0). This lifetable index indicates how many years a person reaching a certain age x may, on average expect to live, given continuation of the mortality conditions underlying the lifetable. Usually, this index does not only give a good picture of the overall health situation in the country but, more generally also of the overall level of development. For this reason, longevity as measured by e_0 is one of the three components of the Human Development Index (HDI).

A comparison of the e_0 values in Table VII-C1 indicates that:

- Between 1986 and 2007, e_0 for the total population has remained approximately the same. In comparison, during the 1960s and 1970s, Fijians gained about 13 years and Indians almost 20 years in life expectancy.[61]

- During the last two decades, e_0 for Fijians decreased slightly due to a decrease for females. The difference between the male and female e_0, which used to be close to four years has steadily decreased to about two years in 2007 (to the advantage of the females).

- On the other hand, after 1986, e_0 for Indians has continued to increase, albeit at a very moderate pace. Moreover, this is entirely due to a gain of about three years for Indian females.

- As a result of the increase in e_0 for Indian females and the stagnation in e_0 for Indian males, the difference between male and female life expectancy, which was approximately four years in 1986, has increased to more than seven years in 2007 (to the advantage of the females). There is no reason to believe that this widening gap is caused by differential completeness of death registration by the NHIS. The most likely explanation for this widening gap is that Indian males are significantly more affected by lifestyle disease than Indian females. The difference in the ASDRs for Indian males and females over the age of 40 seems to confirm this.

Finally, Table VII-C1 also presents two versions of the overall death rate, viz. the Crude Death Rate (CDR) and the intrinsic death rate (d). These are also indices of overall mortality.

The CDR is not a lifetable function and it cannot be read or derived from a lifetable. Moreover, this crude rate (and changes in this rate) must be interpreted with the utmost care. The reason is that the CDR is not only affected by changes in the level of mortality but also by changes in the age-sex structure. In order for these rates to become comparable, they need to be standardized. This means that the impact of the differences in age structure on the CDR must be eliminated. The CDRs in Table VII-C1 have not been standardized and are therefore not comparable. The increase in the CDR since 1986 for all component populations is mainly due to the fact that the Fijian and even more so the Indian age-sex structure has since that year significantly narrowed at the base due to a decline in fertility.

The intrinsic death rate (d) is defined as the death rate that the population would eventually attain if the population would become stationary given the mortality and fertility conditions of

[61]Bakker, 2013.Forthcoming.

the relevant lifetable.[62]The d values in Table VII-C1 are comparable. It will be noted that given the continuation of the fertility and mortality conditions underlying the lifetables for the four selected years, the level of mortality, once the stationary state has been achieved, would be about the same.

1.4. Summary

In the 1960s and 1970s, (and probably also in the years before that after World War II), all components of the population of Fiji experienced very significant gains in life expectancy. The stagnation in the mortality transition started in the mid-1980s or, in the case of adults possibly already in the late 1970s. The present analysis based on 2006-2008 NHIS data suggests that this stagnation has continued at least until 2007.[63] The comments made in the previous sections indicate that this stagnation is more pronounced in the case of adults than in the case of infants and children. During the last two decades, only the mortality transition of Indian females has made some very modest progress.

Some politically inclined pundits will be quick to point out that this stagnation in the mortality transition is probably a direct consequence of the uncertain political situation in Fiji since the mid-1980s. It is widely believed that all coups were followed by deterioration in the health care delivery system, a decrease in paid employment and income etc. Although these are undoubtedly very important factors that have contributed to the stagnation, the entire truth is almost certainly more complicated. It is likely that there are alternative factors that have also contributed to the stagnation in the adult mortality transition. In the Analytical Report of the 1996 Census, some other reasons for the stagnation in the adult mortality transition have been proposed.[64] These include:

- Increase in lifestyle disease for adults

  This is supported by the morbidity and cause of death statistics of the NHIS. The impact of non-communicable diseases such as cancer, cardiovascular disease, stroke etc. is increasing. This increase is first of all associated with deterioration in lifestyle (smoking, drinking, drug abuse, lack of exercise, junk food etc.) and probably not so much with the uncertain political situation.

- "Health drain"

  The contribution of (health) differential emigration to Australia, New Zealand, USA and Canada to the stagnation in the adult mortality transition has, in recent decades, probably become more pronounced. This is particularly the case for the Indian population but increasingly also for the Fijian population. Emigration since 1987 is of course closely

[62]The intrinsic death rate (d) can be derived from a lifetable. For a stationary population, the intrinsic death rate can be calculated from the lifetable e_0 value:

$$\mathbf{d = b = 1/e_0}$$

where b is the intrinsic birthrate of the stationary population.

[63] Unfortunately, the NHIS has not yet released more recent data by age, sex and ethnicity.

[64] FBoS, 1998:65-66.

related to the political situation in Fiji. It is caused by emigration requirements enforced by the countries of destination.

In recent years, the impact of these additional factors has most likely become more important.

2. Differences in the level of mortality at the provincial level.

As mentioned, it is not yet possible to construct sectoral lifetables and lifetables at the provincial level from NHIS death registration data. Consequently, the analysis of mortality at this level remains dependent on retrospective data collected in censuses.

The first attempt to estimate mortality parameters at the provincial level indirectly from retrospective data collected in a census was made during the analysis of the 1996 Census. This analysis resulted in some key parameters of mortality, viz. the IMR and e_0 for each of the provinces.[65]

A more comprehensive analysis of provincial level mortality, based on provisional data of the 2007 Census was carried out in 2009. During this analysis, it became clear that there were some serious flaws in the basic data and this led to inconsistent results. It is unlikely that most of the shortcomings in the 2007 lifetime fertility data have been introduced during the field operation (enumerator and response errors). It is more likely that the inconsistencies in the data were introduced during the processing phase. In this respect, it is important to note that the 2007 census data was, for the first time scanned. It seems that scanning may have affected the quality of the lifetime fertility data more than most other data from this census.

Since the initial mortality analysis of the 2007 data in 2009 did not lead to consistent results, the FBoS decided to key in all lifetime fertility data in the conventional manner. It appears that the quality of this data, though improved, remains far from ideal. However, it was concluded that, given a cautious approach towards the data during the analysis, it would be possible to obtain reasonably accurate mortality indices, even at the provincial level.

The average estimates of early childhood mortality for 2007 in this Analytical Report have been obtained from the lifetime fertility reports of women in the broad age-group 20-34. The rationale for the selection of the lifetime fertility reports by this group of women is that the reports by these relatively young and better educated women are more complete and reliable than those of very young women (under the age of 20) and older women (aged 35 and over).

Generally, the maternal and paternal orphanhood data from the 2007 Census, (used in Part B for the estimation of adult mortality probabilities), appears to be of better quality than the lifetime fertility data of this census. As in the case of the analysis of maternal and paternal orphanhood data from previous censuses, the mortality probabilities based on the orphanhood reports of respondents in a certain age range, in this case the age range 20-44 are more reliable and consistent than those of younger and older respondents. The maternal and particularly paternal orphanhood reports by young respondents appear to be affected by adoption bias. Furthermore, the orphanhood reports of older respondents refer on average to mortality conditions long before 2007. Consequently, as in the analysis of orphanhood data from

[65] Bakker, 2000:40-44.

previous censuses, the adult mortality probabilities were once again based on the orphanhood reports of the most reliable respondents, those in the age group 20-44.

In Part B of this chapter, the early childhood and adult mortality estimates of females and males have been spliced together, using the same model that has been used in all indirect mortality analysis in Fiji since 1976, viz. Brass' GPST. The key mortality parameters of the provincial lifetables that have been generated in this manner are presented in Table VII-C3. The following comments refer to the mortality parameters in this table:

- Table VII-C3 includes the indirectly estimated mortality parameters by sex at the national level. It will be noted that these estimates portray a somewhat less favorable picture of mortality than those based on NHIS data in Table VII-C1. For instance, the difference in e_0 for the total population is almost 2 years. One reason for the discrepancy between the two sets of independently derived estimates is undoubtedly that, although death registration by the NHIS has improved significantly, it is not yet complete.

- Since it is not yet possible to derive NHIS-based estimates of mortality at the provincial level, the inter-provincial comparison in Table VII-C3 is necessarily based on estimates indirectly derived from the 2007 Census. It should be kept in mind that these province level mortality parameters depict a somewhat too rosy picture of the mortality situation for the provinces.

- In all provinces, except Rotuma, early childhood mortality estimates are lower and life expectancies at all ages are higher for females than for males. Higher male than female mortality is in accordance with sex-differential analysis of mortality based on previous censuses as well as well as NHIS data since 1986. The exceptional case of Rotuma in the 2007 Census analysis may be the result of chance fluctuations in the basic data due to the fact that the analysis is based on relatively small numbers.

- There is relatively little variation in mortality at the provincial level. Although the range between the province with the lowest and highest e_0 is 4 years, e_0 for ten of the fifteen provinces is within one year of the national average of 65.2 years.

Table VII-C3: Key indices of two-parameter lifetables at the provincial level by sex estimated from 2007 Census data

Province	Sex	Index								
		IMR (‰)	U5MR $ (‰)	e_0 (yrs)	e_5 (yrs)	e_{25} (yrs)	e_{65} (yrs)	e_{85} (yrs)	CDR @ (‰)	d# (‰)
Fiji	**P**	**18**	**35**	**65.2**	**62.4**	**43.9**	**10.6**	**2.8**	**9**	**16**
	M	**19**	**38**	**64.1**	**61.5**	**43.1**	**10.2**	**2.7**	**9**	**16**
	F	**16**	**32**	**66.2**	**63.3**	**44.7**	**10.9**	**2.8**	**9**	**15**
Provinces of the Western Division										
Ba	**P**	18	37	64.8	62.2	43.6	10.5	2.8	9	16
	M	19	38	64.1	61.6	43.1	10.2	2.7	9	16
	F	17	35	65.4	62.7	44.1	10.7	2.8	9	15
Nadroga/ Navosa	**P**	16	32	66.0	63.6	44.5	10.8	2.8	9	16
	M	18	36	64.5	61.9	43.4	10.3	2.7	9	16
	F	14	28	67.4	64.3	45.5	11.2	2.8	9	15
Ra	**P**	19	37	64.8	62.2	43.7	10.5	2.8	11	16
	M	23	46	62.1	60.0	41.8	9.8	2.7	12	16
	F	14	28	67.4	64.3	45.5	11.2	2.8	9	15
Provinces of the Central Division										
Naitasiri	**P**	17	34	65.5	62.7	44.2	10.7	2.8	8	15
	M	17	35	64.8	62.1	43.6	10.4	2.7	8	15
	F	16	32	66.2	63.3	44.7	10.9	2.8	8	15
Rewa	**P**	19	38	64.5	61.9	43.4	10.4	2.8	10	16
	M	21	42	63.1	60.7	42.4	10.0	2.7	10	16
	F	17	34	65.8	63.0	44.4	10.8	2.8	9	15
Tailevu	**P**	15	31	66.5	63.6	44.8	10.9	2.8	9	15
	M	16	33	65.6	62.8	44.1	10.6	2.7	8	15
	F	14	28	67.4	64.3	45.5	11.2	2.8	9	15
Namosi*	**P**	18	35	65.2	62.4	43.9	10.6	2.8	8	16
	M	19	38	64.1	61.5	43.1	10.2	2.7	8	16
	F	16	32	66.2	63.3	44.7	10.9	2.8	8	15
Serua	**P**	15	30	67.0	64.0	45.1	11.1	2.8	8	15
	M	16	33	65.6	62.8	44.1	10.6	2.7	8	15
	F	13	26	68.3	65.1	46.1	11.5	2.8	8	15
Provinces of the Northern Division										
Bua	**P**	19	39	64.2	61.7	43.3	10.4	2.8	11	16
	M	21	43	62.7	60.5	42.2	9.9	2.7	11	16
	F	17	34	65.7	62.9	44.3	10.8	2.8	10	15
Cakaudrove	**P**	15	31	66.5	63.6	44.9	10.9	2.8	9	15
	M	17	34	65.2	62.5	43.9	10.5	2.7	9	15
	F	13	27	67.8	64.7	45.8	11.3	2.8	8	15
Macuata	**P**	18	36	65.0	62.3	43.8	10.5	2.8	9	16
	M	19	38	64.1	61.6	43.1	10.2	2.7	9	16
	F	17	34	65.8	63.0	44.4	10.8	2.8	9	15

Provinces of the Eastern Division										
Kadavu	**P**	15	30	66.7	63.7	45.0	11.0	2.8	11	15
	M	15	31	66.0	63.1	44.4	10.7	2.7	10	15
	F	15	29	67.4	64.3	45.5	11.2	2.8	11	15
Lau	**P**	14	26	67.7	64.5	45.6	11.3	2.8	12	15
	M	15	31	66.1	63.1	44.4	10.7	2.7	12	15
	F	12	23	69.3	65.9	46.8	11.8	2.8	11	14
Lomaiviti	**P**	17	35	65.3	62.6	44.0	10.6	2.8	10	16
	M	21	43	62.7	60.5	42.2	9.9	2.7	10	16
	F	13	27	67.8	64.7	45.8	11.3	2.8	9	15
Rotuma	**P**	20	41	63.7	61.4	42.9	10.3	2.8	16	16
	M	17	35	64.8	62.1	43.6	10.4	2.7	15	15
	F	23	46	62.6	60.6	42.3	10.1	2.8	18	16

Notes * The quality of the lifetime fertility data for the small population of Namosi appeared to be insufficient for the estimation of reliable early childhood mortality parameters. The national average parameters have been imputed.

$ The Under-Five Mortality Rate (U5MR) has been defined as the probability of dying during the first five years of life ($1-l_5/l_0$)

@ The Crude Death Rates (CDR) in this table have not been standardized and are therefore not comparable

Intrinsic death rate

3. Pattern of mortality

Until 1976, relatively little was known about the precise pattern of mortality in Fiji. During the mortality analysis based on 1946, 1956 and 1966 Census data carried out in the early 1970s, it was assumed that Fiji's pattern of mortality was closest to that represented by the West family in the recently published Regional Model Lifetables (MLT) developed by Coale and Demeny.[66] However, in the absence of complete death registration data, it was not possible to confirm this assumption. Analysts selected the West pattern as the most appropriate model because it is the most general of the four regional patterns.[67]

Since 1976, censuses in Fiji included the maternal and paternal orphanhood questions in addition to the lifetime fertility questions. As a result, it became possible to generate more flexible two-parameter logit lifetables for females and males by splicing together estimates of early childhood mortality by sex (from lifetime fertility data) with female and male survivorship rates (from maternal and paternal orphanhood data).[68] The slope (β) of the generated lifetables for the total population as well as all sub-populations appeared to be significantly higher than 1.0.[69] This indicates that in Fiji, early childhood mortality at that time was relatively low compared to that in Brass' general purpose standard table (GPST). On the other hand, adult mortality was relatively high compared to that in the GPST.[70] This finding

[66] These model lifetables (MLT) can be found in Coale A.J. and P. Demeny, 1966.The Coale-Demeny model patterns of mortality, North, East, South and West have been based on historical mortality experience in European countries.

[67] The North, East and South patterns are far more specific mortality patterns than the West pattern. There was no evidence that the conditions underlying these patterns were found in Fiji.

[68] This more flexible two-parameter logit lifetable system was devised by Brass. (Brass, 1971)

[69] Using 1976 Census data, the β value of the Fijian lifetable for females as well as males was estimated as 1.19 and that of the lifetables for Indian females as well as males as 1.18. (Zwart, 1979:212-220 and 144-146).

[70] In the mortality analysis based on census data in Fiji as well as neighboring countries in the South Pacific Region, Brass' General Standard Table (GPST) has consistently been used. Consequently, all the measured

did not come as a surprise. In the 1970s, a very significant proportion of all children in Fiji were already born in a hospital, health center or maternity unit and MCH services covered most children and their mothers before, during and after childbirth. On the other hand medical outreach activities for adults were (and still are) far more limited.

All Fiji censuses after 1976 included the maternal and paternal orphanhood questions and, as expected, the mortality "slope" (β values) of all generated lifetables from the data from these censuses has remained much higher than 1.0. The 2007 Census data confirms again that early childhood mortality in Fiji remains relatively low and adult mortality relatively high compared to the GPST. This is probably mainly a reflection of the fact that the priorities of health service delivery in Fiji and in particular with regard to its outreach activities have not notably changed. However, due to rapidly increasing emigration, the β values of the lifetables have, may in recent years, have become less robust, especially in the case of the Indian population.[71]

Since the early 1980s, the Regional Model Lifetables of Coale and Demeny have gradually been replaced by the United Nations Model Lifetables for Developing Countries.[72] This set of MLTs has specifically been designed for statistically underdeveloped countries, or more specifically for developing countries with incomplete and deficient death registration data. The models are based on reasonably accurate data concerning death by age and sex from a large number of developing countries. However, most of these countries are Asian and Latin American countries. Unfortunately, due to lack of basic information, African mortality experience is not represented in these models. The same applies to mortality experience in countries of the South Pacific Region.

This new set of model mortality patterns derived from data for developing countries made it possible to make a more detailed study of the precise pattern of mortality in Fiji. A first attempt was made after the 1986 Census data became available. It was found that in the case of Fiji, certain model patterns of the new UN set provide a closer fit of the mortality patterns underlying the 1985-1987 NHIS data than the regional models of Coale and Demeny.

Next, in a review of the NHIS data on mortality, carried out in 1998, central ASDRs derived from NHIS data on death by sex and ethnicity for the period 1995-1997 were compared with the ASDRs of all UN as well as the Coale-Demeny Model Lifetables. The MORTPAK programme COMPAR was used. Indices of dissimilarity were calculated based on average absolute deviations from the median.[73] This exercise confirmed that of all the model patterns of mortality, the empirical mortality pattern of Fijian males and females is best described by the UN Far Eastern pattern of mortality. The situation with regard to the Indian population appeared to be somewhat less straightforward, especially in the case of Indian females. Nevertheless, within the UN family of mortality patterns, the Far East model always performed better than the other four UN models. Consequently, this model was used in the 1996 Census analysis.

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[70]mortality slopes (β) and mortality levels (ά) are comparable. The mortality slope (β) of the GPST = 1 and the mortality level (ά) = 0.

[71] This is particularly the case for rural and urban lifetables and lifetables for the provinces. Due to rapidly increasing rural-urban migration and inter-provincial migration, an ever-increasing proportion of census respondents reports on the vital status of a mother/father who is residing in another sector/province than they themselves.

[72]United Nations, 1982.

[73] This procedure and the resulting indices of dissimilarity by sex and ethnicity can be found in: FIBoS, 1998: 185-186.

The next assessment of NHIS data, carried out in 2003, and based on 2000-2002 NHIS data confirmed the above findings.[74] Finally, the same fitting exercise was again carried out in 2009 using NHIS the data for the years 2006-2008 centered on census year 2007. The results, based on ASDRs centered on 1996, 2001 and 2007 are presented in Table VII-C4. The best fit is indicated **in bold**. When in the case of a particular model, the index of dissimilarity becomes 0; this model fits the empirical ASDRs exactly. In other words, the lower the index of dissimilarity, the better the fit.

The 2007 indices of dissimilarity confirm once again that the Far East pattern provides by far the best fit for Fiji's empirical mortality data. Moreover in 2001 and 2007, this also applies to the Indian females. The indices of dissimilarity in Table VII-C4 also confirm that the selection of the West model of the Coale-Demeny MLTs, during the mortality analysis based on 1946, 1956 and 1966 Census data, was the optimal choice.

Table VII-C4: Indices of dissimilarity between the central ASDRs of the population by sex and ethnicity in 2007, 2001 and 1996, from the median $_nm_x$ values in the United Nations Model Life Tables for developing countries and the Coale-Demeny Regional Model Life Tables.

Model Pattern	Fijian Males			Fijian Females			Indian Males			Indian Females		
	1996	**2001**	**2007**	**1996**	**2001**	**2007**	**1996**	**2001**	**2007**	**1996**	**2001**	**2007**
United Nations Model Lifetables												
Lat. Am.	14.3	11.1	8.8	12.1	8.5	8.2	26.6	15.9	9.5	13.9	6.5	4.2
Chilean	5.8	6.8	4.6	8.2	6.2	6.0	17.9	11.1	5.2	13.8	5.3	2.9
S. Asian	18.7	7.8	5.8	13.9	6.9	6.9	29.8	13.4	7.0	16.8	5.6	4.3
Far East	**1.6**	**2.1**	**1.5**	**2.4**	**3.7**	**3.2**	**9.9**	**5.2**	**2.1**	9.0	**3.8**	**1.5**
General	9.2	6.6	4.8	8.3	6.2	6.0	21.3	11.3	5.5	12.5	5.0	3.0
Coale and Demeny Regional Model Lifetables												
West	7.4	7.5	5.5	4.1	6.8	6.5	17.6	11.8	6.6	**5.7**	5.4	2.8
North	12.5	11.4	10.1	5.7	9.6	9.4	23.3	14.9	10.8	7.0	7.0	4.6
East	6.3	7.9	6.0	5.4	7.1	7.0	16.4	12.9	7.4	7.9	5.6	3.6
South	13.6	9.5	8.1	11.4	9.3	9.4	22.9	13.6	9.3	14.0	7.5	5.8

Source: Bakker, 2011:35

Finally, the pattern of mortality (ASDRs) derived from a complete and accurate registration system of a particular population represents the true pattern of mortality of that population. The pattern of mortality of a two-parameter logit lifetable estimated indirectly from census is a generalized pattern.

[74] Bakker, 2006:

VIII. FERTILITY

In several chapters of this Analytical Report, reference has already been made to fertility and the estimation of various fertility indices.

- Chapter I discusses fertility as one of the components of natural increase.

- Chapter II emphasizes the impact of fertility change on the age-sex structure. It also introduces the Child-Woman Ratio (CWR), which can be considered as a proxy index of fertility.[1]

- Chapter VII introduced the lifetime fertility questions that have been asked during censuses in Fiji since 1946. In Chapter VII, this information was used for the indirect estimation of early childhood mortality. In Chapter VIII, the same information is used for the measurement of lifetime fertility.

- Chapter VII also introduced another important index of fertility, the mean age of mothers as well as the fathers at the time of birth of their children.[2]

The analysis of the 1996 Census included an assessment of the birth registration data compiled by the NHIS over the period 1995-1997 (centered on census year 1996). This information was available by age of mother and ethnicity but not by geographic level and sector. In 2003, the evaluation of NHIS data was continued, using birth registration data for the period 2000-2002.[3]The fertility parameters calculated from NHIS data were compared with those obtained from census data.

In the present Analytical Report of the 2007 Census, the fertility analysis is unfortunately mainly based on census data. Initially, the programme for the 2007 Census analysis included the calculation of recent fertility parameters from NHIS data for the years 2006-2008 (centered on census year 2007 Census). Unfortunately at the time of writing, this data had not yet been made available by the NHIS.

Consequently, the fertility analysis in this chapter is far more limited than that of mortality in the previous chapter. Furthermore, a more comprehensive analysis of this data will be carried out in a 2007 Census Research Monograph. Finally, this chapter does not include an analysis of differential fertility, using the "own-children" technique. This will be the topic of a special FBoS Research Paper on differential fertility.

[1] Although the CWR is not a very robust indicator of fertility, it has the advantage that it can be calculated whenever a new age-sex structure of the population becomes available, i.e. from a census. Moreover, in the case of a census, the CWR can be calculated for the smallest sub-groups of the population.

[2] In Chapter VII, these indices were used as inputs for the indirect estimation of early childhood and adult mortality.

[3] This analysis centered on the year 2001, the midpoint between the 1996 Census and the next census that at that stage was still scheduled for the year 2006.

Chapter VIII is divided into four sections.

- Section 1 discusses some general issues related to the study of fertility.
- Section 2 critically assesses the conventional sources of fertility data and homes in on the measurement of fertility from retrospective data collected during Fiji's censuses.
- Section 3 is concerned with the measurement of lifetime as well as current fertility based on data collected during Fiji's censuses. It critically assesses the fertility parameters obtained by means of various techniques. It presents a picture of the current fertility situation and trends.
- Section 4 revisits population growth in Fiji by comparing growth rates and rates of natural increase that have been calculated from the CDRs in Chapter VII and CBRs derived in this chapter.

1. General issues related to the study of fertility

1.1. Lifetime and current fertility

Fertility refers to actual reproductive performance.[4] As in the case of mortality, there are two different approaches towards the measurement of fertility:

- Lifetime or cohort measurement

  This refers to the measurement of fertility for a cohort of women. It is concerned with the number of live born children the cohort members have given birth to during their reproductive lifespan. The average number of live born children to a cohort of women who have reached the end of their reproductive period is a measure of average completed family size for this cohort. Cohort fertility is also referred to as lifetime fertility.[5]

- Current or recent fertility measurement

  This approach to the measurement of fertility focuses on reproductive performance during a short period of time, usually a calendar year. The women whose fertility is measured do not belong to one cohort but to many different cohorts. Together they form a hypothetical or synthetic cohort. Period analysis uses vital rates like age specific fertility rates (ASFR), total fertility rates (TFR) etc.

[4] Fertility should not be confused with fecundity. The latter refers to possible reproductive performance or the physiological ability to bear children. The opposite of fertility is infertility and the opposite of fecundity is sterility.

[5] The concepts longitudinal and generational fertility also refer to fertility of a cohort of women.

1.2. Complications in the study of fertility

The analysis of fertility is for a variety of reasons less straightforward than the analysis of mortality. Some of these reasons are briefly discussed below.

i. Population at risk

The population at risk of undergoing the event birth is less clearly defined than in the case of mortality. In the case of mortality, each member of the population is at risk. Moreover, for each member of the population, the event death will occur only once. In the case of fertility:

- Only females in the reproductive age range are at risk of undergoing the event birth. For practical purposes, it is usually assumed that the reproductive age span ranges from age 15 to age 49. This is also the case in this Analytical Report.[6]
- Not all women within the reproductive age span are at risk. Those who are sterile or choose not to have children are not at risk.
- Women within the reproductive age span who have given birth to one child can continue to have more children. The element of personal preference and choice largely determines how many children a woman will have in her lifetime. This choice is closely linked with socio-economic, educational, religious and cultural factors.[7]

ii. Female and Male fertility

Birth can be linked with the mother, the father or the couple. In most countries, the mother as well as the father and their basic characteristics appear on the birth certificate of each child that is registered. From the analytical point of view, it is easier and more straightforward to link births with the mother than with the father. Some reasons include that:

- In a significant number of cases, the father (and his characteristics) are not known and/or not recorded on the birth certificate.
- The reproductive age span for men is not as clearly defined as that for women.
- Reproduction rates like the Gross Reproduction Rate (GRR) and Net Reproduction Rate (NRR) are by definition indices of female fertility.
- If fertility information is collected in a census (or survey), the event birth is derived from the response to questions asked of women (usually those age 15

[6] Births, with few exceptions, occur to women within the age rang 15-49. Moreover, since fertility of women aged 45-49 is very low in most countries that have completed or almost completed their fertility transition, the reproductive age span in these countries is often officially reduced to 15-44.

[7] A census cannot exactly determine the population at risk of giving birth. However, this is possible in a specialized (sample) survey that establishes the complete birth history of women and inquires about the knowledge of, attitude towards and practice of family planning (KAP), reproductive health etc.

and over). These data collection systems seldom provide any information on male fertility.

Father-linked fertility indices, if available, tend to be less precise than mother-linked fertility indices.

In Fiji, the mother as well as the father and their basic characteristics must be recorded on the Birth Notification Form of each child that is registered. So far, information on male fertility from this source has never been published.

iii. Live births and stillbirths

The numerator of fertility rates includes the number of live born children during a fixed period of time**.** It does not include stillbirths. However the definition of a live born child is complex. For laypersons, it is in borderline cases, difficult if not impossible to distinguish between live born and stillborn children. There is circumstantial evidence of confusion of live and stillbirths during censuses in Fiji. Furthermore, Fiji's birth registration system may also have a certain live born/still born bias.

iv. Multiple births

Fertility estimation from registration data is based on all children that are born alive during a particular period. About one in a hundred births is a multiple birth. Recent censuses in Fiji included a question about the date of birth of the last-born child (DOB of LBC). This implies that in the case of multiple births, only one event is recorded.

2. Data sources

The main data sources that can be used for the estimation of fertility levels, patterns and trends are the same as those in the case of mortality viz.:

- Service (administrative) statistics (birth registration data)
  - From the CRS
  - From the NHIS
- Retrospective information on fertility collected in censuses and surveys

2.1. Service statistics

Nowadays in Fiji, virtually all births occur in a hospital or other health facility.[8] After giving birth, the doctor, nurse or midwife in attendance issues a "notification of birth" in duplicate. This notification contains the particulars of the birth such as basic information concerning the

[8] In 2001, 0.5 % of all births were supervised by a Traditional Birth Attendant (TBA) and 2.0 % by a districts nurse.

mother and father of the child, i.e. age, marital status and ethnicity, as well as the usual place of residence of the mother at the time of the birth and information concerning parity.[9]The original is provided by the mother. Parents use this notification to register the child. They are required to do this within two months after the birth.[10] Unfortunately, since 1976, the Registrar General's Office (RGO) has not published any information regarding registered births.

In 1996, the RGO introduced the BDM System. The objective of this system is to computerize all vital events in Fiji that occurred since 1900 and to link the births and deaths. For a variety of reasons, i.e. problems with the matching of names, this project has failed. However, a byproduct of this project is that computers have been installed in the four major hospitals of the country (Suva, Lautoka, Labasa and Levuka). These computers are linked with the RGO. Births occurring in these hospitals are now registered on line. The FBoS has access to the on-line registrations. So far, the BDM system has not been extended to other hospitals in the country.

The pre-censal reviews of the performance of the CRS and NHIS with regard to death registration, discussed in Chapter VII, also included a review of birth registration. The reviews concluded that death as well as birth registration remains affected by several shortcomings. In the case of birth registration, shortcomings refer in particular to late registration, mis-recording of age of mother, failure to record the correct place of birth of the child (usual place of residence of the mother at the time of birth) etc.[11]

Generally, the incentives to register the birth of a child are greater than the incentives to register the death of a deceased person. It may therefore be expected that in countries where registration is not yet complete, birth registration data is more complete and accurate than death registration data. This is indeed usually the case. In Fiji, more than 98 percent of all births occur in a health facility with trained medical personnel in attendance. This implies that for virtually all new born children there is probably an official record.

In spite of this, in Fiji, official vital statistics that are available to the analyst are far more complete in the case of deaths than of births. As mentioned in Section 1, although a comprehensive analysis of death registration data from the NHIS for the years 2006-2008 could be carried out (See Chapter VII), it is, in 2012, not possible to do the same for birth registration data from this source, simply because a reasonably complete set of this data by age of mother has not yet been made available for analysis. This implies that the fact that a birth certificate has been completed does not necessarily mean that this birth has also been included in the statistics of the NHIS. The most important reason for under-recording of birth in Fiji is almost certainly not due to failure by medical personnel to register the births but to inadequate processing and management of the completed birth certificates.

[9] See also: the Annual Reports Vital Statistics Fiji." of the FBoS.

[10] If parents register a child more than two months after it occurred, the Registrar General requires a declaration that the particulars concerning the birth are correct. If parents register a birth more than 12 months after it occurred, a late registration fee is charged.

[11] A study of historical birth registration data suggests that that some births occurred to women well outside the reproductive age span 15-49. It is assumed that many of these are late registrations, where the registrar has registered the age of the mother at the time of registration and not at the time of birth.

2.2. Censuses and surveys

As in the case of mortality, censuses since 1946 have been used for the collection of data that can be employed for fertility estimation.

- The lifetime fertility questions, discussed in Chapter VII are not only used for the estimation of early childhood mortality but also for the measurement of lifetime fertility.

- Moreover, since 1986, censuses have included a question concerning the date of birth of the last born child (LBC). From this information, current fertility can be estimated.

- Finally, fertility levels, patterns and trends, as well as differential fertility can be estimated from censuses in which mothers and their natural children staying in the same household can be linked. In the case of Fiji, this has been the case since the 1986 Census.

Unfortunately, Fiji has never carried out a nation-wide Demographic and Health Survey (DHS). The DHS scheduled for 2012-2013 has unfortunately been cancelled. Consequently, very little detailed information for instance concerning the determinants of fertility, birth histories, knowledge, attitude and practice of family planning is therefore available.[12]

3. Fertility indices estimated from census data

A detailed account of the methodology used in the estimation of lifetime as well as current fertility from census data can be found in the Analytical Report of the 1996 Census. Section 3.1 of this chapter is concerned with lifetime fertility and Section 3.2 with current fertility, estimated from the 2007 Census.

3.1. Lifetime fertility

➢ National level

Lifetime fertility data collected during all censuses since 1946 provides cohort measures of completed family size. The average number of children born to women aged 45-49 (P_7) can be considered as a minimum estimate of completed family size or cohort fertility. Table VIII-1a presents the average number of children ever born (CEB) to women aged 15-19, 20-24….45-49 reported during the 1976, 1986, 1996 and 2007 Censuses. The information is provided at the national level for the main ethnic groups. The average numbers of children born alive in this table are the P_i values used in the early childhood mortality analysis in Chapter VII.

[12] Fiji did, however, participate in the World Fertility Survey in the 1970s. The pilot test for this survey was carried out in Fiji in 1973.

Table VIII-1a: Average number of children ever born at the national level by age of mother and ethnicity derived from lifetime fertility data since the 1976 Census

Year	Age group						
	15-19	20-24	25-29	30-34	35-39	40-44	45-49
Total Population							
1976	0.09	0.92	2.29	3.58	4.67	5.48	6.22
1986	0.09	0.86	2.01	2.96	3.67	4.24	4.76
1996	0.08	0.75	1.79	2.60	3.15	3.57	3.88
2007	0.12	0.76	1.58	2.38	2.88	3.21	3.36
Fijians							
1976	0.09	0.86	2.11	3.35	4.41	5.11	5.63
1986	0.10	0.82	1.95	3.02	3.81	4.36	4.65
1996	0.08	0.70	1.76	2.71	3.40	3.88	4.19
2007	0.12	0.81	1.70	2.55	3.14	3.52	3.71
Indians							
1976	0.08	0.95	2.42	3.81	4.95	5.91	6.87
1986	0.09	0.92	2.09	2.94	3.58	4.19	4.91
1996	0.08	0.83	1.86	2.51	2.94	3.29	3.64
2007	0.12	0.69	1.46	2.15	2.54	2.82	3.00

Table VIII-1b: Average number of children ever born at the national level by age of mother, ethnicity and geographic sector derived from lifetime fertility data in 1996 and 2007

Year	Ethnicity	Age group						
		15-19	20-24	25-29	30-34	35-39	40-44	45-49
All Sectors								
1996	**Total Pop.**	0.075	0.751	1.791	2.600	3.153	3.566	3.880
	Fijians	0.075	0.704	1.762	2.712	3.399	3.883	4.189
	Indians	0.077	0.830	1.863	2.509	2.940	3.294	3.639
2007	**Total Pop.**	0.121	0.756	1.584	2.381	2.879	3.207	3.358
	Fijians	0.121	0.807	1.698	2.546	3.137	3.521	3.713
	Indians	0.124	0.694	1.458	2.148	2.542	2.818	2.995
Rural Sector								
1996	**Total Pop.**	0.093	0.919	2.038	2.874	3.451	3.871	4.214
	Fijians	0.092	0.845	1.951	2.949	3.654	4.126	4.438
	Indians	0.093	1.016	2.144	2.784	3.222	3.577	3.977
2007	**Total Pop.**	0.136	0.943	1.863	2.649	3.174	3.493	3.627
	Fijians	0.145	0.985	1.911	2.764	3.388	3.771	3.912
	Indians	0.124	0.865	1.772	2.393	2.799	3.048	3.233
Urban sector								
1996	**Total Pop.**	0.058	0.610	1.543	2.308	2.848	3.272	3.530
	Fijians	0.056	0.569	1.542	2.407	3.070	3.590	3.868
	Indians	0.062	0.681	1.590	2.243	2.679	3.049	3.321
2007	**Total Pop.**	0.109	0.625	1.369	2.153	2.613	2.933	3.112
	Fijians	0.102	0.656	1.483	2.308	2.856	3.219	3.475
	Indians	0.124	0.590	1.269	1.984	2.394	2.628	2.815

P_i values for women beyond the reproductive age span (not shown in Table VIII-1a) indicate that the data is still affected by a certain amount of recall (memory) lapse. However, the impact of recall lapse has drastically decreased compared to that during the early censuses in 1946, 1956 and 1966. The P_i values for women within the reproductive age span remain undoubtedly also affected by some recall lapse but this form of bias has become very small in the case of young women.

Cohort fertility has decreased rapidly since the 1960s. However, the fertility transition for the Indian component of the population started earlier and has progressed much faster than that of the Fijian component. Table VIII-1b provides somewhat more detailed information of completed family size by ethnicity and geographic sector, as reported during the two most recent censuses in 1996 and 2007

- Provincial level

Table VIII-2 presents a picture of completed family size at the provincial level as reported during the 1996 and 2007 Censuses. It appears that most provinces with a relatively large population have, in 2007, a level of cohort fertility that is slightly lower than the national average level of 3.4. Most of these provinces have a relatively large urban population. Moreover, the proportion of Indians (with on average lower fertility) in these provinces is also significant. Not surprisingly, the provinces with the largest Indian as well as urban population (Ba, Naitasiri, and Rewa) have a completed family size in the range 3.0-3.3.

The only provinces that, in 2007, still have a level of cohort fertility that is higher than 4.0 are Namosi and Bua. Moreover, the provinces of the Eastern Division (except Rotuma) as well as Cakaudrove have a level of cohort fertility that is close to 4.0. These provinces have in common that they have a relatively small, almost exclusively rural population, consisting mainly of Fijians.

Table VIII-2: Average number of children ever born by age of mother at the provincial level, derived from lifetime fertility data in 1996 and 2007

Province	Year	Age group						
		15-19	20-24	25-29	30-34	35-39	40-44	45-49
Fiji	**1996**	**0.075**	**0.751**	**1.791**	**2.600**	**3.153**	**3.566**	**3.880**
	2007	**0.121**	**0.756**	**1.584**	**2.381**	**2.879**	**3.207**	**3.358**
Provinces of the Western Division								
Ba	**1996**	0.074	0.778	1.788	2.518	3.016	3.378	3.673
	2007	0.171	0.798	1.608	2.344	2.775	3.043	3.226
Nadroga/Navosa	**1996**	0.088	0.790	1.723	2.546	3.119	3.484	3.847
	2007	0.145	0.861	1.576	2.350	2.777	3.227	3.285
Ra	**1996**	0.074	0.880	2.028	2.965	3.660	4.039	4.374
	2007	0.106	0.815	1.811	2.623	3.216	3.510	3.721
Provinces of the Central Division								
Naitasiri	**1996**	0.960	0.637	1.627	2.429	3.024	3.471	3.751
	2007	0.077	0.625	1.415	2.197	2.706	3.088	3.255
Rewa	**1996**	0.051	0.499	1.386	2.232	2.706	3.125	3.403
	2007	0.088	0.553	1.237	2.049	2.574	2.899	3.045
Tailevu	**1996**	0.068	0.786	1.764	2.635	3.325	3.747	3.919
	2007	0.126	0.777	1.721	2.545	3.109	3.268	3.580
Namosi	**1996**	0.082	0.735	1.951	3.020	3.922	4.492	5.032
	2007	0.107	0.901	1.802	2.754	3.486	4.030	4.024
Serua	**1996**	0.067	0.787	1.891	2.805	3.403	3.677	4.179
	2007	0.160	0.805	1.769	2.532	3.004	3.480	3.637
Provinces of the Northern Division								
Bua	**1996**	0.102	1.264	2.287	3.130	3.996	4.181	4.543
	2007	0.228	1.148	1.994	2.899	3.522	3.736	4.099
Cakaudrove	**1996**	0.125	1.039	2.188	3.130	3.663	4.326	4.667
	2007	0.126	1.118	2.036	2.916	3.425	3.911	3.960
Macuata	**1996**	0.105	0.983	2.074	2.783	3.260	3.801	4.139
	2007	0.088	0.888	1.802	2.522	2.948	3.198	3.360
Provinces of the Eastern Division								
Kadavu	**1996**	0.063	0.827	2.200	3.178	3.915	4.322	4.587
	2007	0.096	0.905	1.835	2.797	3.370	4.122	3.943
Lau	**1996**	0.122	0.912	2.141	3.169	3.777	4.202	4.833
	2007	0.141	1.068	1.912	2.716	3.533	3.991	3.943
Lomaiviti	**1996**	0.075	0.972	2.302	3.107	4.061	4.421	4.953
	2007	0.087	0.953	1.816	2.867	3.515	3.950	3.905
Rotuma	**1996**	0.061	0.807	1.975	2.815	3.651	4.415	3.765
	2007	0.106	0.975	1.778	3.346	3.759	3.612	3.746

3.2. Current fertility

In the analysis of current fertility based on data from recent censuses, three different data sets have been used.

- During the 1986, 1996 and 2007 censuses, all women age 15 and over were asked to report the date of birth of their last born child (LBC), irrespective of the vital status of this child at the time of the census.

- "Own-children" analysis. This analysis, based on the matching of young children and their own (natural) mother has been carried out since the 1976 Census.

- The 1986 and 1996 Census analysis included the analysis of birth registration data by age of mother recorded by the NHIS.

Unfortunately, for reasons mentioned, in the present analysis, it is not possible to include an analysis based on birth registration data by age of mother recorded by the NHIS. Some reference will, however be made to the most recent analysis of NHIS data based on birth registration data for the period 2000-2002.

Moreover, as mentioned, the estimation of current fertility levels, patterns and trends by means of the "own-children" technique will be included in a Census Research Monograph whereas a scheduled FBoS Research Paper intends to focus on the estimation of differential fertility. Consequently, the analysis in this chapter will mainly concentrate on LBC information collected during the 2007 Census.

3.2.1. Methodology used in the analysis of LBC data

The interview schedule of all censuses since 1986 included a question concerning the date of birth of their last born child (LBC). All women age 15 and over were asked this question. Minimum fertility parameters, such as age-specific fertility rates (ASFR), total fertility rates (TFR) and reproduction rates can be calculated from the births that occurred in the year before the census.

- ASFRs and TFR

  The computational procedure, using data for the total population in 2007, is shown in Table VIII-3. This table also demonstrates the computation of the mean age of mothers at the time of birth of their children ($\overline{M}^{Mo}$).[13]

  ASFRs are calculated by dividing the number of children born in the year before the 1996 Census in column (4) by the female population enumerated during the 2007 Census in column (5). The ASFRs are shown in column (6).

[13] $\overline{M}^{Mo}$ was already used in the mortality analysis in Chapter VII.

Table VIII-3: Example of the computation of ASFRs, TFR and $\overline{M}^{Mo}$ from 2007 Census data concerning last born children in the year before the census

Age Females [1]	i [2]	Central Age [x] [3]	Nr. of LBCs [w_i] [4]	Nr. Fems 2007 [5]	ASFR [f_i] [6]	[$w_i.x_i$] [7]
15-19	1	17	1,381	38,698	.0357	23,477
20-24	2	22	5,414	39,037	.1387	119,108
25-29	3	27	5,568	36,101	.1542	150,336
30-34	4	32	3,555	30,720	.1157	113,760
35-39	5	37	1,634	27,775	.0588	60,458
40-44	6	42	566	27,678	.0204	23,772
45-49	7	47	104	24,486	.0042	4,888
Sum	-	-	**18,222**	**224,495**	**.5277**	**495,799**

The sum of the seven ASFRs is 0.5277. However, since the ASFRs are averages for five-year age groups, the TFR is obtained by multiplying this sum by five:

$$\mathbf{TFR} = \mathbf{5}\sum_{\mathbf{1}}^{\mathbf{7}} \mathbf{fi}$$

This leads to a TFR = 2.64.

- $\overline{M}^{Mo}$

$\overline{M}^{Mo}$ can be calculated from birth registration data as well as census (survey) data. Since recent birth registration data by age of mother is presently not available, $\overline{M}^{Mo}$ has been calculated from 2007 Census data. (Response to the Census question regarding the date of birth of the last born child). In the basic census tabulations, the children born in the year before the 2007 Census are presented by age of mother.[14]The mean age of mothers at the time of birth of their children, $\overline{M}^{Mo}$, has been calculated from the data in Table VIII-3, using the formula:

$$\overline{\mathbf{M}}^{\mathbf{Mo}} = \left[\sum_{\mathbf{i=1}}^{\mathbf{7}}(\mathbf{wi}.\mathbf{xi}\right] / \sum \mathbf{wi}$$

where

x = The central age of the women in each of the five-year age groups[15]

[14] The CEBCS programme of MORTPAK 4 also has the option to enter the average number of children ever born and average number of children surviving by duration of marriage. In the South Pacific Region, including Fiji, the lifetime fertility is never collected by duration of marriage of women.

[15] The x values in column (3) are 17, 22….47 and not 17.5, 22.5……47.5. The reason is that the age of the women in column (1) represents the age at the time of the 2007 Census and not the age of these women at the time of birth of their children. The later age is on average 0.5 years less than their age at the time of the census.

W_i= The number of children born in the year before the census by age group of mothers.

The products (w_ix_i) are shown in column (7) of Table VIII-3. $\overline{M}^{Mo}$ is obtained by dividing the sum of the seven figures in column (7), $\sum w_ix_i$ (for i is 1 to 7) by the sum of all the weights, $\sum w_i$.

$$\overline{M}^{Mo} = 495{,}799 / 18{,}222 = 27.2 \text{ years}$$

- Reproduction rates

Reproduction rates include the Gross Reproduction Rate (GRR) and the Net Reproduction Rate (NRR). The GRR can easily be derived from the TFR. For this the sex ratio at birth is required. Birth registration data from the NHIS suggests that Fiji's sex ratio at birth may be slightly higher than the world average figure of 105 males per 100 female children. One explanation for the possibly slightly higher sex ratio at birth in Fiji may be due to somewhat more complete reporting of male children than that of female children. However, this is a very unlikely explanation.

In order to maintain comparability with the results from previous censuses, the world average sex ratio at birth of 105 has again been used in the 2007 Census analysis. This implies that the proportion of female children (of all children) is 100/205 is .4878. The GRR for the total population can now be derived from:

$$\textbf{GRR} = .4878 \times \textbf{TFR}$$

The GRR for the total population, derived from 2007 Census data is therefore:

$$\textbf{GRR} = .4878 \times 2.6393 = 1.29$$

Determining the NRR requires a somewhat more laborious procedure. The computation of the NRR for the total population in 2007 is demonstrated in Table VIII-4. The ASFRs for females in column (4) are obtained by multiplying the ASFRs (for both sexes) in column (3) with the factor .4878.

In the case of the GRR, it is assumed that all females will survive until the end of their reproductive age span. In the case of the NRR, the impact of mortality must be taken into account. The ${}_nL_x$ values in column (5) have been taken from the 2007 lifetable for females. They indicate the number of person years a woman would on average live during the five-year period, assuming that the mortality conditions of the lifetable apply.[16] This means that the female ASFRs values in column (4) need to be multiplied by the ${}_nL_x$ values in column (5). The results are shown in column (6). The sum of the seven values in column (6) is the NRR. Based on information regarding the date of birth of LBC, the NRR for the total population is therefore 1.20 which is slightly above replacement level.

[16] In the case of the GRR, no mortality is assumed and all values in column (5) would therefore be 5.0000

Table VIII-4: Example of the computation of the NRR from 2007 Census data

Age Females [1]	i [2]	ASFR* (3)	$ASFR^{fem}$ (4)	${}_nL_x^{\#}$ (5)	(4)x(5) (6)
15-19	1	.0357	.0174	4.78213	.0832
20-24	2	.1387	.0677	4.74176	.3210
25-29	3	.1542	.0752	4.69117	.3528
30-34	4	.1157	.0564	4.63539	.2614
35-39	5	.0588	.0287	4.57047	.1312
40-44	6	.0204	.0100	4.48970	.0449
45-49	7	.0042	.0020	4.38272	.0088
Sum	-	**.5277**		-	**1.2033**

Notes *These are the f_i values in column (6) of Table VIII-3
These are the ${}_nL_x$ values from the female lifetable in 2007

- Crude rates

  Finally, the Crude Birth Rate (CBR) and General Fertility Rate (GFR) can be calculated from the LBC data.

  The CBR is defined as the total number of births in a year (here the number of children born in the year before the census), divided by the mid-year population (here the total population at the time of the 2007 Census), times 1,000. In this case:

  CBR = 18,222 / 837,271 = 22‰

  The GFR attempts to use a denominator that is closer to the real population at risk: the women in the reproductive age span 15-49. In this case:

  GFR = 18,222 / 224,495 = 81 ‰

3.2.2. Adjustment of LBC data: The P/F ratio technique

All fertility rates estimated from LBC data must, for a variety of reasons be considered as minimum rates.

- Under-reporting of last born children who were dead at the time of the census.

  Women are asked to report the date of birth of their last child born alive. Some women may report the date of birth of the last born child still alive at the time of the census. If their most recent live born child passed away before the census, the date of birth of this child should have been recorded instead. The next question on the interview schedule inquires about the vital status of this last born child. This should remind those women who reported incorrectly that the previous question should have been answered irrespective of the vital status of the child at the time of the interview. There is evidence

that LBC data from Fiji censuses is indeed affected by this kind of error. For instance, infant mortality rates calculated directly from the data on LBCs and their vital status tend to be lower than the ones calculated from NHIS data as well as those indirectly from lifetime fertility data in Chapter VII.

- Failure to capture multiple births

  If the last pregnancy of a woman resulted in multiple births, the date of birth of only one child will be recorded. Prior to the 2007 Census, Area Coordinators, supervisors and enumerators in Fiji were instructed to make a note of multiple births on the interview schedule. However, it seems that this information may not always have been recorded and it has not been processed.

- Failure to capture births in cases of a birth interval of less than one year

  In a very small number of cases, a woman may have given birth twice during the one-year period before the census. In that case, only the date of birth of the last born child will be recorded. However, birth intervals of less than one year are exceptional in Fiji.

It must therefore be concluded that, due to the above factors, all estimates of fertility based on LBC data in Fiji must be slightly lower than the real ones. In other words, since the number of LBCs during the year before the census has been under-reported, the resulting rates must be considered as minimum rates. Preferably, these minimum rates should be adjusted to raise them to the correct level. In cases like this, the P/F ratio technique is frequently used.[17] This adjustment procedure is based on a comparison of the two types of census (survey) data, both recorded by age of mother, discussed in this chapter:

- Information on current births by age of mother obtained from data on children born in a short reference period (usually one year) prior to the census

- Information on the number of CEB to each woman, obtained retrospectively by means of the lifetime fertility questions.

Because of the logical relationships between these two data sets, a comparative assessment often leads to detection of errors and hence to a possibility to adjust the rates.

In a population with constant fertility, the average number of CEB at each age for a cohort of women is the same as the cumulative total of the ASFRs at that age. In an actual population, this situation is approximated as long as the fertility of this population has not been subject to much change in the recent past. In that case, the ASFRs of each cohort are approximately the same as the current ASFRs.[18]

For most real populations, the two sets of indices (those based on retrospective and current data) obtained in a census (survey) do not agree. The current data based on births in the year prior to the census usually presents a picture of too low (but sometimes of too high) fertility. Furthermore, retrospective data often increases too slowly with increasing age of women and decreases for women beyond the reproductive age span. Both the current and retrospective

[17] For this adjustment technique see: Brass, W. and A.J. Coale, 1968:89-104)
[18] Moreover, it is assumed that the women dying have the same fertility as those surviving.

datasets tend to be deficient. However, the nature of the errors in the two sets is different. The errors in the:

- Current data are believed to be related to imprecision of the reference period. Even though the current data is affected by a reference period error, this error is systematic. The shape of the current fertility distribution can therefore be considered as approximately correct.

- Retrospective data are related to omission or recall lapse as women get older. Lifetime fertility reports by young women are believed to be reasonably accurate since these young women are usually better educated and they report on events that occurred recently. Moreover, in most cases, the children of these young women reside in the same household as the reporting mother.

Brass' P/F ratio technique, devised to adjust current fertility data, is based on the two propositions that:

- The pattern of fertility based on current births may be accepted as approximately correct

- The level of fertility based on the retrospective data (average nr of CEB) of younger women may be accepted as approximately correct.

The application of Brass' adjustment technique, using retrospective and current fertility data from the 2007 Census is presented in Table VIII-5. Retrospective and current fertility data collected for the total population in 2007 is used. The average number of children ever born (CEB) by age of women (P_i) recorded during the 2007 Census and the age specific fertility pattern (ASFP) derived from the LBC data of this census are presented in column (2) and (3) respectively. Column (4) shows the ASFRs that are consistent with the retrospective data (CEB).

In column (5) the recorded age specific fertility pattern by age of mother at the time of the census has been converted into an age specific fertility pattern at the time of birth. It will be noted that this has not changed the level of fertility. The TFR remains 2.64.

Table VIII-5: Example of the adjustment of ASFRs and TFR for reference period error in 2007 Census data on last born children in the year before the census, using Brass' P/F ratio technique

Age women (time of 2007Census) (1)	Recorded data in 2007		Fert. consistent with CEB (ASFR) (4)	Fert. pattern by age at childbirth (5)	Cumulation		Adjustment factors (P/F ratio) (8)	ASFR (Adj. using P_2/F_2) (9)
	Av. Nr CEB (P_i) (2)	Fert. pattern time census (ASFR) (3)			ASFR (6)	Fert. pattern by age at birth (7)		
15-19 (i = 1)	0.121	.0357	.0744	.0451	.0744	.0451	1.6482	.0551
20-24 (i = 2)	0.756	.1387	.1586	.1458	.2330	.1909	**1.2204**	.1779
25-29 (i = 3)	1.584	.1542	.1675	.1519	.4005	.3428	**1.1683**	.1854
30-34 (i = 4)	2.381	.1157	.1346	.1095	.5351	.4523	**1.1831**	.1337
35-39 (i = 5)	2.879	.0588	.0725	.0543	.6076	.5066	1.1993	.0663
40-44 (i = 6)	3.207	.0204	.0451	.0180	.6527	.5246	1.2443	.0219
45-49 (i = 7)	3.358	.0042	.0167	.0031	.6694	.5277	1.2686	.0038
TFR		**2.64**	**3.35**	**2.64**				**3.22**

Next the converted retrospective data in column (4) and the current data in column (5) have been cumulated in column (6) and (7) respectively. From this cumulated data, the adjustment factors, Brass' P/F ratios, have been calculated. These adjustment factors are shown in column 8). As mentioned, retrospective fertility, as reported by young women is considered as more reliable than that of older women. Moreover reports by very young women, those under the age of 20, tend to be unreliable. As in Chapter VII, it is once again assumed that the reports by women in the age range 20-34 are the most reliable ones. Ideally, the adjustment factors based on the data of these three five-year age groups should be approximately the same. This is not the case. For adjustment of the recorded age specific fertility pattern, it must now be decided which adjustment factor should be used. In the example in Table VIII-5, the adjustment factor based on the reports of women 20-24 (P2/F2) has been used. The adjusted age specific fertility rates and TFR, based on $P_2/F_2 = 1.2204$, are shown in column 9).[19] Compared to the recorded data, all ASFRs and the TFR in column (9) have been increased very significantly by 22 %! The question is whether these inflated ASFRs and TFR represent a more reliable picture of the fertility pattern and level in Fiji in 2007 than the recorded (unadjusted) ones. The question needs to be addressed whether the 2007 Census data in Fiji meets the prerequisites for the application of this technique. This will be done in Section 3.2.4.

3.2.3. The "own-children" technique

The "own-children" approach towards fertility estimation generates a wealth of information on fertility. The fertility indices obtained by means of the "own-children" technique are completely independent from those obtained from LBC information or from NHIS data.

- Assuming that the age cut-off point for children is age 15, the "own-children" technique provides estimates of the ASFRs and TFRs for each of the 15 years prior to the census. It therefore provides a detailed picture of the level and pattern of fertility.

- Apart from providing a comprehensive picture of the fertility level and pattern, this technique therefore also establishes the trend in fertility. If the "own-children" technique is applied to successive censuses carried out with an interval of 10 years, the estimates based on the successive censuses overlap. This provides the analyst with an opportunity to assess the validity of the fertility estimates.

- The most important advantage of applying the "own-children" technique is that it can be used for differential fertility analysis. The technique can be applied to all sub-groups of the population that the census identifies and for which separate information regarding fertility levels, pattern and trend is required. This usually includes subgroups of women in different labour force and employment categories, women with different levels of formal education, different migration status, different religious beliefs etc. The analysis can be meaningfully performed as long as the population for which the estimates are made is large enough. In order to reduce bias due to small numbers, fertility parameters can be averaged over a period of three or five years.

[19] If P3/F3 or P4/F4 had been selected for adjustment, all rates would have been increased by 17 % or 18 % respectively.

The analysis of all past censuses in Fiji since 1976 included a limited "own-children" analysis. Some of the results of the analysis have been included in the Analytical Reports of these censuses. In the case of the 2007 Census, the FBoS has decided that the "own-children" analysis should be more comprehensive than on previous occasions.

- The scheduled Census Research Monograph on fertility should include a comprehensive analysis of recent fertility levels and patterns but also of fertility trends, based on the application of the "own-children" technique.

- Further fertility analysis, focusing on establishing levels, patterns and trends in differential fertility for a large variety of demographic and socio-economic sub-groups of women, based on the application of the "own-children" technique, will be carried by the FBoS and the results will be published in a special research paper.

Users, interpreting the "own-children" based estimates and comparing them with those estimated from LBC data collected in a census or with NHIS based estimates, should be familiar with the various forms of bias that may affect the fertility parameters obtained by means of all methods. Those regarding the "own-children" technique have been detailed in Technical Note 5 of this Analytical Report.

3.2.4. Discussion of the results

- National level

Table VIII-6 presents minimum estimates of the ASFRs and TFRs at the national level by ethnicity and geographic sector. These are the unadjusted rates based on the LBC data reported by women in the retrospective age range 15-49 during the 1996 and 2007 Censuses.

As mentioned, these minimum ASFRs and TFRs in Table VIII-6 should ideally be adjusted for under-reporting. In Section 2.1.2, the adjustment of under-reported current fertility rates using Brass' P/F ratio technique was discussed. This adjustment procedure assumes that the errors in the retrospective and current rates are systematic. The validity of this assumption is further explored in Table VIII-7. This table presents the adjusted age specific fertility patterns and TFRs for the total, Fijian and Indian population in 2007 and 1996, if Brass' multiplying factor P_2/F_2 is applied. It will be noted that these multiplying factors are very substantial, especially in the case of the Indian population. Furthermore, Table VIII-8 provides the multiplying factors P_2/F_2 at the provincial level in 2007. If the current fertility data from this census was indeed affected by a systematic reference period error, one would not expect the extreme fluctuation in the multiplying factors $P_2/F2$ at the provincial level!

Table VIII-6: Minimum estimates of ASFRs and TFRs at the national level by ethnicity and geographic sector, derived from data on the date of birth of last born children in the 1996 and 2007 Censuses

Year	Ethnicity	Age group							TFR
		15-19	20-24	25-29	30-34	35-39	40-44	45-49	
All Sectors									
1996	**Total Pop.**	.0289	.1554	.1620	.1144	.0590	.0223	.0065	**2.74**
	Fijians	.0298	.1611	.1839	.1473	.0882	.0342	.0085	**3.27**
	Indians	.0314	.1580	.1338	.0692	.0261	.0083	.0033	**2.15**
2007	**Total Pop.**	.0357	.1387	.1542	.1157	.0588	.0204	.0042	**2.64**
	Fijians	.0366	.1527	.1798	.1456	.0843	.0308	.0069	**3.18**
	Indians	.0352	.1208	.1203	.0686	.0221	.0061	.0015	**1.87**
Rural Sector									
1996	**Total Pop.**	.0363	.1823	.1750	.1222	.0667	.0252	.0082	**3.08**
	Fijians	.0380	.1897	.2000	.1603	.1025	.0384	.0101	**3.70**
	Indians	.0372	.1806	.1392	.0677	.0233	.0074	.0038	**2.30**
2007	**Total Pop.**	.0423	.1710	.1735	.1288	.0671	.0252	.0061	**3.07**
	Fijians	.0464	.1859	.1970	.1589	.0924	.0369	.0095	**3.64**
	Indians	.0355	.1451	.1285	.0683	.0232	.0058	.0017	**2.04**
Urban sector									
1996	**Total Pop.**	.0216	.1331	.1489	.1061	.0512	.0195	.0046	**2.43**
	Fijians	.0209	.1336	.1652	.1305	.0697	.0290	.0065	**2.78**
	Indians	.0258	.1399	.1285	.0708	.0286	.0090	.0027	**2.03**
2007	**Total Pop.**	.0304	.1160	.1394	.1046	.0514	.0159	.0025	**2.30**
	Fijians	.0282	.1246	.1626	.1311	.0754	.0233	.0036	**2.74**
	Indians	.0349	.1061	.1153	.0688	.0213	.0063	.0014	**1.77**

Table VIII-7: Comparison of recorded and adjusted ASFRs and TFRs, using Brass' P_2/F_2 multiplying factors for the total, Fijian and Indian population in 1996 and 2007.

Year	Indices	ASFRs for age group							TFR
		15-19	20-24	25-29	30-34	35-39	40-44	45-49	
All Sectors: Total Population									
1996	**Unadjusted**	.0289	.1554	.1620	.1144	.0590	.0223	.0065	**2.74**
	Adj. (P_2/F_2 = 1.2683)	.0488	.2077	.2009	.1370	.0696	.0255	.0062	**3.48**
2007	**Unadjusted**	.0357	.1387	.1542	.1157	.0588	.0204	.0042	**2.64**
	Adj. (P_2/F_2 = 1.2204)	.0551	.1779	.1854	.1337	.0663	.0219	.0038	**3.22**
All Sectors: Fijians									
1996	**Unadjusted**	.0298	.1611	.1839	.1473	.0882	.0342	.0085	**3.27**
	Adj. (P_2/F_2 = 1.1663)	.0456	.1994	.2125	.1648	.0963	.0355	.0074	**3.81**
2007	**Unadjusted**	.0366	.1527	.1798	.1456	.0843	.0308	.0069	**3.18**
	Adj. (P_2/F_2 = 1.2058)	.0557	.1949	.2153	.1682	.0947	.0328	.0062	**3.84**
All Sectors: Indians									
l996	**Unadjusted**	.0314	.1580	.1338	.0692	.0261	.0083	.0033	**2.15**
	Adj. (P_2/F_2 = 1.3426)	.0576	.2195	.1697	.0849	.0321	.0104	.0033	**2.89**
2007	**Unadjusted**	.0352	.1208	.1203	.0686	.0221	.0061	.0015	**1.87**
	Adj. (P_2/F_2 = 1.2571)	.0566	.1573	.1452	.0785	.0251	.0069	.0014	**2.35**

Table VIII-8: Comparison of recorded and adjusted TFRs, using Brass' P_2/F_2 multiplying factors for the provincial populations of Fiji in 2007

Province	TFR (Rec)	Multipl. (P_2/F_2)	TFR (Adj)	Province	TFR (Rec)	Multipl. (P_2/F_2)	TFR (Adj)
Fiji (2007)	**2.64**	**1.2204**	**3.22**	**Fiji (1996)**	**2.74**	**1.2683**	**3.48**
Provinces Western Division				**Provinces Northern Division**			
Ba	2.43	1.2607	3.07	**Bua**	4.18	0.7924	3.51
Nadroga	2.79	1.1053	3.08	**Cakaudrove**	3.60	1.1995	4.32
Ra	3.32	1.1040	3.67	**Macuata**	2.51	1.3625	3.42
Provinces Central Division				**Provinces Eastern Division**			
Naitasiri	2.38	1.2589	2.90	**Kadavu**	3.76	1.1212	4.22
Rewa	2.33	1.1492	2.68	**Lau**	3.66	1.0850	3.97
Tailevu	2.69	1.4191	4.32	**Lomaiviti**	3.66	1.0665	3.90
Namosi	4.04	1.0185	4.12	**Rotuma**	3.56	1.2050	4.29
Serua	3.58	0.9371	3.35				

In assessing the results in Table VIII-7 and 8, it must be emphasized that, in the case of censuses in Fiji, the LBC data has not been obtained by means of a question that inquires about *children born in the year before the census.* If that had been the case, the assumption of a reference period error in the current fertility data might be reasonable. However, women were asked to report the *date of birth of their last born child.* It is very unlikely that the dates of birth reported by women are affected by systematic predating or postdating; the more so since during the census interview women are frequently asked to produce documentary evidence (birth certificate, health card with a date of birth on it) in order to verify the information that has been provided.

Nowadays, Brass' P/F ratio technique is often mechanistically applied in order to adjust current fertility data obtained from a census or survey that is supposed to be affected by under-reporting. In many of these cases, the use of this technique is probably not justified.[20]Although it is clear that, for the reasons mentioned, the current fertility indices based on LBC data from Fiji censuses are affected by a slight amount of under-reporting, it is highly unlikely that this is the result of a systematic reference period error in the date of birth data. It must therefore be concluded that the adjustment of the minimum current fertility rates based on LBC data in Table VIII-6, (using the very doubtful multiplying factors presented in Table VIII-7 and 8), is <u>not</u> warranted.

This conclusion is further supported by a comparison of, on the one hand the unadjusted TFRs for the total population as well as Fijians and Indians in 1996 in Table VIII-6, (based on LBC data from the 1996 Census) and on the other, the TFRs calculated from the NHIS data for the period 1995-1997. This comparison, presented in Table VIII-9, indicates that the unadjusted TFRs based on the 1996 Census are in all cases only marginally lower than those calculated from NHIS data.

[20] An example of the application of the P/F ratio technique that cannot be considered as justified is the 1971 census in PNG. (Bakker, 1985:7-9). Nowadays, the mechanistic application of this adjustment technique has become even more of a problem since this technique has been included as one of the into the MORTPAK programmes. As a result, the technique is now often used in situations where it should not be used.

Table VIII-9: Comparison of 1996 and 2007 census-based TFRs for the total population by ethnicity with those calculated from NHIS data for the periods 1995-1997 and 2000-2002.

Ethnicity	1996		2007	
	Unadj. TFR (2007 LBC data)	TFR (1995-1997 NHIS data)*	Unadj. TFR (2007 LBC data)	TFR (2000-2002 NHIS data*
Total Pop.	2.7	2.9	2.6	2.7
Fijians	3.3	3.5	3.2	3.3
Indians	2.2	2.4	1.9	2.0

Note: * For the TFRs obtained from NHIS data, see Bakker, 2011a

Unfortunately, the same comparison cannot be made between TFRs estimated from LBC data from the 2007 Census and TFRs based on NHIS data for the period 2006-2008. However Table VIII-9 compares the unadjusted census-based TFRs in 2007 and TFRs based on NHIS data for the period 2000-2002. It appears that the difference between the two estimates of the TFR based on these different sources has become even smaller.

This provides further evidence that it does not make sense to adjust the current fertility rates based on 1996 and 2007 LBC data by means of the questionable multiplying factors in Table VIII-7 and 8. Consequently, the further discussion regarding the level, pattern and trend in fertility in this chapter is therefore based on the unadjusted minimum fertility rates based on the LBC data.

The following Table VIII-10 provides a summary of all key indices of current fertility at the national level, derived from 1996 and 2007 Census data. Apart from the indices discussed in Section 2.1, the Child-Woman Ratios (CWR), estimated in Chapter II has also been included.[21] The information in Table VIII-10 suggests that:

- Although during the intercensal period 1996-2007 the fertility transition in Fiji has continued, it has done so only very marginally for Fijians and significantly for Indians.
- The Indian population has now achieved a TFR which is far below replacement level.
- In the case of the Fijians, the fertility transition seems to be stalling in the rural as well as the urban sector. The fertility transition continues to progress significantly for Indians in the rural as well as the urban sector.
- Although it is possible that the current fertility data (concerning LBCs) in 2007 is slightly more complete and accurate than that for 1996, there is no reason to believe that this seriously affects comparability of the current fertility data for the two years.

[21] The CWR is defined as the number of children under the age of five divided by females in the reproductive age span (15-49) expressed per 100. As noted in Chapter II, the CWR is a proxy index of fertility that is calculated from the age-sex structure and cannot be considered as a robust fertility parameter. However, if estimated from a census, it has the advantage that it is available for the smallest sub-populations.

Table VIII-10: Key indices of fertility at the national level by ethnicity and geographic sector, estimated from data on last born children in the year before the 1996 and 2007 Censuses

Ethnicity	Year	Index							
		CBR (‰)	GFR (‰)	TFR	GRR	NRR	$\overline{M}^{Mo}$ (yrs)	$\overline{M}^{Fa}$ (yrs)	CWR
All Sectors									
Total Pop.	**1996**	20	76	2.74	1.34	1.25	27.6	30.8	47
	2007	22	81	2.64	1.29	1.20	27.2	30.8	37
Fijians	**1996**	22	90	3.27	1.60	1.50	28.5	31.6	55
	2007	25	98	3.18	1.55	1.45	27.8	31.3	45
Indians	**1996**	17	61	2.15	1.05	0.99	26.0	29.6	37
	2007	16	58	1.87	0.91	0.86	25.8	29.8	25
Rural Sector									
Total Pop.	**1996**	20	85	3.08	1.50	1.40	27.6	-	54
	2007	23	92	3.07	1.50	1.40	27.4	-	43
Fijians	**1996**	23	101	3.70	1.80	1.68	28.6	-	64
	2007	26	110	3.64	1.77	1.65	27.9	-	52
Indians	**1996**	17	65	2.30	1.12	1.05	25.7	-	42
	2007	16	60	2.04	1.00	0.94	25.6	-	27
Urban Sector									
Total Pop.	**1996**	19	67	2.43	1.19	1.11	27.5	-	40
	2007	21	72	2.30	1.12	1.05	27.0	-	32
Fijians	**1996**	21	76	2.78	1.36	1.25	28.3	-	46
	2007	25	85	2.74	1.34	1.25	27.5	-	38
Indians	**1996**	17	57	2.03	0.99	0.94	26.3	-	34
	2007	17	57	1.77	0.86	0.81	25.9	-	24

- Provincial level

Table VIII-11 presents minimum estimates of the ASFRs and TFRs at the provincial level and Table VIII-12 provides a summary of all indices of fertility at the provincial level.

Table VIII-11: Minimum estimates of ASFRs and TFRs at the provincial level derived from data on the date of birth of last born children in 1996 and 2007

Province	Year	Age group							TFR
		15-19	20-24	25-29	30-34	35-39	40-44	45-49	
Fiji	**1996**	**.0289**	**.1554**	**.1620**	**.1144**	**.0590**	**.0223**	**.0065**	**2.74**
	2007	**.0357**	**.1387**	**.1542**	**.1157**	**.0588**	**.0204**	**.0042**	**2.64**
Provinces of the Western Division									
Ba	**1996**	.0287	.1619	.1514	.0928	.0419	.0162	.0067	2.50
	2007	.0355	.1374	.1467	.1013	.0496	.0137	.0022	2.43
Nadroga	**1996**	.0363	.1777	.1614	.1231	.0730	.0263	.0053	3.02
	2007	.0517	.1526	.1451	.1217	.0593	.0236	.0040	2.79
Ra	**1996**	.0307	.1664	.1671	.1218	.0667	.0277	.0069	2.94
	2007	.0477	.1724	.1894	.1490	.0745	.0196	.0122	3.32
Provinces of the Central Division									
Naitasiri	**1996**	.0254	.1413	.1551	.1124	.0604	.0239	.0043	2.61
	2007	.0288	.1174	.1405	.1122	.0552	.0188	.0024	2.38
Rewa	**1996**	.0182	.1097	.1440	.1155	.0591	.0169	.0040	2.34
	2007	.0296	.1081	.1345	.1134	.0586	.0174	.0046	2.33
Tailevu	**1996**	.0280	.1586	.1708	.1213	.0799	.0316	.0121	3.01
	2007	.0371	.1227	.1698	.1218	.0656	.0173	.0740	2.69
Namosi	**1996**	.0392	.1504	.2411	.1814	.1173	.0508	.0319	4.06
	2007	.0515	.1939	.2120	.1500	.1091	.0739	.0178	4.04
Serua	**1996**	.0238	.1848	.1834	.1180	.0566	.0267	.0419	3.04
	2007	.0491	.1986	.2282	.1257	.0811	.0270	.0059	3.58
Provinces of the Northern Division									
Bua	**1996**	.0235	.2008	.2316	.1541	.1030	.0334	.0057	3.76
	2007	.0994	.2779	.1834	.1749	.0819	.0515	.0161	4.18
Cakaudrove	**1996**	.0420	.2165	.1999	.1739	.0962	.0428	.0100	3.91
	2007	.0462	.2010	.1962	.1491	.0773	.0394	.0110	3.60
Macuata	**1996**	.0390	.1678	.1575	.0987	.0440	.0163	.0058	2.65
	2007	.0245	.1597	.1566	.0960	.0437	.0170	.0039	2.51
Provinces of the Eastern Division									
Kadavu	**1996**	.0275	.1693	.2262	.1331	.1307	.0217	.0054	3.56
	2007	.0491	.1743	.2108	.1667	.0992	.0526	.0000	3.76
Lau	**1996**	.0291	.1866	.2153	.1685	.0654	.0357	.0038	3.52
	2007	.0361	.2222	.2193	.1306	.0964	.0210	.0071	3.66
Lomaiviti	**1996**	.0321	.1949	.1989	.1744	.0609	.0428	.0062	3.55
	2007	.0400	.2016	.1782	.1667	.0874	.0504	.0073	3.66
Rotuma	**1996**	.0261	.1579	.2250	.1522	.0723	.0122	.0118	3.29
	2007	.0471	.1500	.2222	.1154	.1481	.0299	.0000	3.56

Table VIII-12: Key indices of fertility at the provincial level, estimated from data on the date of birth of last born children in the 1996 and 2007 Censuses

Province	Year	Index							
		CBR (‰)	GFR (‰)	TFR	GRR	NRR	$\overline{M}^{Mo}$ (yrs)	$\overline{M}^{Fa}$ (yrs)	CWR
Fiji	**1996**	**20**	**76**	**2.74**	**1.34**	**1.25**	**27.6**	**30.8**	**47**
	2007	**22**	**81**	**2.64**	**1.29**	**1.20**	**27.2**	**30.8**	**37**
Provinces of the Western Division									
Ba	**1996**	19	69	2.50	1.22	1.13	27.0	30.2	41
	2007	21	76	2.43	1.19	1.10	26.8	30.6	33
Nadroga	**1996**	21	81	3.02	1.47	1.38	27.8	31.2	47
	2007	22	86	2.79	1.36	1.28	27.1	30.9	38
Ra	**1996**	19	79	2.94	1.43	1.34	27.9	31.9	54
	2007	25	99	3.32	1.62	1.53	27.5	31.5	42
Provinces of the Central Division									
Naitasiri	**1996**	20	71	2.61	1.27	1.20	27.5	30.4	45
	2007	21	75	2.38	1.16	1.08	27.0	30.2	35
Rewa	**1996**	18	62	2.34	1.14	1.06	28.2	31.2	39
	2007	21	73	2.33	1.14	1.06	27.4	30.6	32
Tailevu	**1996**	20	83	3.01	1.47	1.39	28.3	31.7	62
	2007	20	82	2.69	1.30	1.24	27.7	31.6	49
Namosi	**1996**	27	118	4.06	1.98	1.84	28.9	32.2	64
	2007	30	126	4.04	1.97	1.84	28.5	32.1	51
Serua	**1996**	21	84	3.04	1.48	1.38	27.7	30.3	55
	2007	29	111	3.58	1.75	1.66	26.8	30.6	37
Provinces of the Northern Division									
Bua	**1996**	23	101	3.76	1.83	1.73	28.5	31.8	64
	2007	28	124	4.18	2.04	1.90	27.6	31.7	53
Cakaudrove	**1996**	24	104	3.91	1.91	1.79	28.2	31.6	68
	2007	25	107	3.60	1.76	1.66	27.8	31.3	52
Macuata	**1996**	19	74	2.65	1.29	1.22	26.8	30.1	47
	2007	19	70	2.51	1.22	1.14	27.0	31.6	34
Provinces of the Eastern Division									
Kadavu	**1996**	20	97	3.56	1.74	1.62	29.1	33.4	65
	2007	25	112	3.76	1.84	1.73	28.1	32.1	58
Lau	**1996**	19	99	3.52	1.72	1.63	28.8	31.5	70
	2007	22	107	3.66	1.79	1.70	27.7	32.1	57
Lomaiviti	**1996**	20	92	3.55	1.73	1.64	28.5	32.1	66
	2007	23	105	3.66	1.78	1.68	28.3	32.9	53
Rotuma	**1996**	17	79	3.29	1.60	1.49	29.3	32.4	47
	2007	18	90	3.56	1.74	1.58	28.9	31.7	47

3.2.5. Final comment

The study of differential fertility is an important component of any fertility analysis. In order to assist the existing programs in Reproductive Health and Family Planning in Fiji, fertility levels, patterns and trends should be estimated for the various subgroups of women for which the census provides information. This minimally includes the following sub-groups:

- Women by level of formal education completed.

  This information should at least be available for women who have not completed primary education, women who completed primary and some secondary education, women who completed secondary education and some tertiary education and those who completed tertiary education. The analysis should also include women by different levels of literacy.

- Women by labour force status

  This includes the main labour force categories: the "economically active" (employed and unemployed) and the "not economically active". Furthermore the information should be available for women with money income, women who are fulltime home workers, women engaged in subsistence activities etc.

- Women by religion.

  The analysis should at least be carried out for women belonging to the main religious groups).[22]

- Women by marital status

  This includes the never married and married (legally as well as de-facto).

- Women by migration status

  This includes all the categories of migrants that the census distinguishes. These can be found in Chapter IX.

Since all censuses since 1986 have established the relationship between mothers and their own children, the most promising approach to the study of differential fertility is a complete analysis using the "own-children" technique. In the case of the 2007 Census, the analysis of differential fertility will be carried out in special Research Paper produced by the FBoS.

[22] The results of the differential fertility analysis of women by religion should also be discussed in the 2007 Census Research Monograph on religion.

4. Revisiting population growth: The rate of natural increase

Population growth is expressed by means of the growth rate and the rate of natural increase.

- Population growth rate

  Chapter I established a comprehensive picture of population growth in Fiji at the national and provincial level since the onset of census taking in the late 19th century. This picture was based on average intercensal rates of growth (r).

- Rate of natural increase.

  The analysis in Chapter VII provides the crude death rates (CDR) and Chapter VIII the crude birth rates (CBR) at the national and provincial level for the years 1996 and 2007. The rate of natural increase (RNI) can now be obtained from:

$$\mathbf{RNI = CBR - CDR}$$

The relationship between r and RNI is expressed by:

$$\mathbf{r = RNI \pm NMR}$$

where NMR is the net-migration rate.

A comparison between the two measures of population growth at the national and provincial level in 2007 is presented in Table VIII-13.

In assessing the difference between the population growth rates (r) and the rates of natural increase (RNI) in this table, it will be realized that these two parameters of growth have been obtained in a very different way. In Chapter I, the rate of growth (r) was calculated from the enumerated population at the time of two censuses using the "compound interest" formula:

$$\mathbf{r = (\ln P_2/P_1) / n}$$

In this formula, P_1 and P_2 refer to the size of the population at the time of the first and second census respectively and n the interval between the two censuses (in years). It is therefore an average rate of growth for the intercensal period, in this case the intercensal period 1996-2007. On the other hand, the RNI has been derived from the CBRs and CDRs that in their turn have been estimated from retrospective data collected during the 2007 Census.

The information in Table VIII-13 suggests that for Fijians at the national level, the rate of growth and rate of natural increase are about the same. This result is probably not quite correct since international migration data suggests that, during the 1996-2007 intercensal period, the net-migration rate (the difference between emigration and immigration) for Fijians was negative. On the other hand, the very significant negative net-migration rate for Indians in Table VIII-13 is in agreement with international migration statistics for the intercensal period.

Table VIII-13: Rates of natural increase, population growth and net-migration at the national and provincial level, derived from 2007 Census data

	r	Vital Rates			NMR
	(%)	CBR (‰)	CDR (‰)	RNI (%)	(%)
Fiji: Total Population	0.7	22	8	1.4	-0.7
Fiji: Fijians	1.7	25	8	1.7	0.0
Fiji: Indians	-0.7	16	8	0.8	-1.5
Provinces of the Western Division					
Ba	0.8	21	9	1.2	-0.4
Nadroga/ Navosa	0.7	22	9	1.3	-0.6
Ra	-0.4	25	11	1.4	-1.8
Provinces of the Central Division					
Naitasiri	2.2	21	8	1.3	0.9
Rewa	-0.1	21	10	1.1	-1.2
Tailevu	1.3	20	9	1.1	0.2
Namosi	1.7	30	8	2.2	-0.5
Serua	1.5	29	8	2.1	-0.6
Provinces of the Northern Division					
Bua	-0.5	28	11	1.7	-2.2
Cakaudrove	1.0	25	9	1.6	-0.6
Macuata	-0.9	19	9	1.0	-1.9
Provinces of the Eastern Division					
Kadavu	0.6	25	11	1.4	-0.8
Lau	-1.2	22	12	1.0	-2.2
Lomaiviti	0.0	23	10	1.3	-1.3
Rotuma	-3.1	18	16	0.2	-3.3

At the provincial level, the only provinces where the rate of growth still exceeds the rate of natural increase are Naitasiri and Tailevu. As shown in Chapter I, Naitasiri Province, (and within this province Naitasiri Tikina), has become the province where in recent times virtually all population growth occurred.

In all other provinces, out-migration exceeds in-migration and their rates of growth are therefore lower than their rates of natural increase. The net-migration rates in Table VIII-13 confirm the conclusions made in Chapter I that the main provinces of population loss are the small provinces Rotuma and Lau, closely followed by Bua, Macuata and Ra.

IX. MIGRATION AND URBANIZATION

This chapter is concerned with the analysis of census data on migration and urbanization. Migration is defined as "the movement of people across a specified boundary for the purpose of residing". This implies a change in usual place of residence of respondents.

Migration (internationally as well as internally) and urbanization have major consequences for the migrants and their families as well as for those who stay behind. It affects the area of origin and destination of migrants. Migration and urbanization is therefore a matter of major concern for policymakers and planners at all levels. In order to carry out their work efficiently, policy makers and planners require a comprehensive, accurate and up to date migration database. In many countries, including Fiji, this is not the case. It is one of the reasons why migration and urbanization issues are often not translated into effective policy.

During the last few decades, migration has become by far the most important contributor to population change in Fiji. This applies to international migration as well as migration between geographic units within the country. Migration and urbanization are notoriously difficult to measure. A first requirement is that these concepts need to be operationalized precisely in terms of space and time.

- Time:

  Many countries apply the rule that a person must have been away from his/her usual place of residence for at least twelve months in order to be considered as a migrant. Other countries use, a six-month or other criterium.

- Space

  The spatial units between which migration is measured need to be precisely defined and delineated.

The use of different time and/or space criteria in migration and urbanization research as well as a change in these criteria makes the results incomparable.

Finally, since a census provides only very limited information on international migration, this is only briefly referred to in this chapter. The main source of information regarding international migration is the records of the Immigration Department. In Fiji, this department records all legitimate movements in and out of the country. This is done at border checkpoints (airports, ports of entry). This information is the basis for the transit statistics compiled by the department. In principle, this system of transit statistics includes all the information collected on the arrival and departure cards such as personal particulars and place of origin and destination. It will be noted that, in the Immigration Department records, the time of leaving or entering the country is the time that the actual border crossing was made.

In the absence of other nationwide sources of information on international migration, policy makers, planners and other users of data on international migration must rely almost entirely on the above transit statistics of the Immigration Department. This department should provide timely and accurate information with regard to in-, out- and net-migration by age, sex, ethnicity, citizenship and some other key characteristics of the migrants. Unfortunately, this

is not the case. At present, the transit statistics on international migration in Fiji have several shortcomings. The non-availability and/or the incompleteness and inaccuracy of this data seriously affect international migration analysis as well as other demographic and socio-economic research in Fiji. As mentioned, with the exception of some information on immigrants, censuses do not collect information concerning international migration.[23]

The measurement of migration between the geographic subdivisions of a country (internal migration) tends to be even more problematic than the measurement of international migration. In most countries, especially those with a democratic form of government, it is illegal to control the movements of people between its spatial units. In other words, all people are free to cross the internal boundaries of the country.

In Fiji, the internal boundaries include those between the major geographic subdivisions: the divisions, provinces and tikinas as well as the boundaries between the geographic sectors (urban and rural) and the individual urban areas, cities and towns. In Fiji, movement between these subdivisions of the country is free and not recorded. Nevertheless, for policy makers and planners, particularly those at the sub-national level (i.e. Provincial Governments, City and Town Councils etc.) the availability of a complete and accurate dataset on internal migration is imperative.

In many, mainly western countries, internal migration is recorded. The most common system being used is a Continuous Population Register (CPR). This system is discussed in some detail in Section 2 of Part A of this chapter. It will be noted that, in the foreseeable future, the introduction of such a system in Fiji is very unlikely. In the absence of a registration system for internal migration, it is difficult to keep track of the movements of persons between the geographic units of a country.

Finally, migration is one of the three demographic processes that determine population change. The other processes, mortality and fertility were discussed in Chapter VII and VIII respectively. Chapter IX consists of two parts, A and B.

- Part A deals with interprovincial migration
- Part B is concerned with migration between the geographic sectors

[23] Unfortunately, the census does not and cannot provide information on emigrants, since they fall outside the scope of the census. The census does, however provide information on immigrants.

PART A

INTER-PROVINCIAL MIGRATION

Part A consists of five sections.

- Section 1 briefly discusses the potential data sources of internal migration in Fiji. In the absence of registration data on internal migration, the census has become the main source of statistics on internal movements

- Section 2 looks at the migration data collected in Fiji's censuses in more detail. This section also includes a discussion of some of the conceptual problems and shortcomings as well as the advantages of internal migration data derived from censuses.

- Section 3 presents a typology of migrants based on census data in Fiji. This typology has been used as a framework for internal migration studies in Fiji since the 1976 census.

- Section 4 contains a basic analysis of the migration status of those included in the 2007 census.

- Section 5 continues the analysis carried out in Section 4 by providing a picture of lifetime as well as recent in-, out- and net-migration at the provincial level.

Part A does <u>not</u> cover the following:

- <u>Migration between the four divisions</u>

  During the analysis of the 1996 Census, a detailed picture of inter-divisional migration has been established and published.[24] In the present Analytical Report of the 2007 Census, this analysis has not been repeated at this geographic level. The main reason is that, although the division is an established administrative unit of the country, in reality it plays only a minor role compared to the province. For planning purposes, the province is by far the most important sub-national unit. Most sub-national level policymaking and planning is carried out at this level. Population projections are produced at the provincial but not at the divisional level. The FBoS attempts to provide the provinces with a database that is as complete and accurate as can be achieved.[25]

- <u>A detailed picture of the characteristics of migrants</u>

  An investigation of the main demographic and socio-economic characteristics of the different types of migrants at the provincial level, based on 1996 Census data was included in a Census Research Monograph on internal migration.[26] It is unlikely that the characteristics of the inter-provincial migrants have changed significantly during the intercensal period 1996-2007. This analysis has therefore not been repeated in the Analytical Report of the 2007 Census.

[24] See FBoS, 1998, Chapter VII and Bakker, 2000.
[25] Although it is in principle possible to carry out a complete analysis of inter-tikina migration, using 2007 Census data, this will not be attempted in this Analytical Report.
[26] Bakker, 2000.

- Causes and consequences of migration

  Finally, this chapter does not and cannot include an analysis of the causes (determinants) and consequences of migration in Fiji. It is not feasible to collect this kind of specialized data in a census. This should preferably be done in a specialized and nationwide Migration Survey. As noted before, such a survey has, unfortunately, never been carried out in Fiji. Moreover it is unlikely that such a survey will be carried out in the foreseeable future.

1. Data sources

There are four potential data sources of internal migration:

- *Service or administrative statistics*
- *Migration surveys based on a representative sample*
- *Small area studies*
- *Censuses*

1.1. Service statistics

Some countries (almost exclusively in the western industrialized world) have introduced a registration system for internal migrants. In most cases, the registration of internal movements is part of a Continuous Population Register (CPR). A CPR does not only record vital events (like a Civil Registration System) but also the usual place of residence of all citizens as well as changes in their usual place of residence. Temporary movements, in other words, movements that do not involve a change in the usual place of residence, are not recorded. Like in the case of birth and death, the onus for the reporting of changes in usual place of residence is on the people themselves. It is important to remember that, like the CRS, a CPR is introduced for legal and administrative purposes whereas the statistics it provides are a byproduct of the system.

An effective and up to date CPR does not only provide a complete and accurate picture of the size, structure and distribution of the de-jure population, down to the lowest geographic level, it also records all changes in these as a result of births and deaths as well as migration (movements between the geographic units of the country). This is exactly the kind of information that planners at the sub-national level need.

Although a CPR is clearly a very powerful data collection system, there are many basic requirements to make it operate efficiently. The most basic requirements are that the following should be in place:

- A comprehensive network of registration offices throughout the entire country
- A sophisticated legal system that underpins the CPR

- Strict security and confidentiality procedures regarding data collection and utilization

- A literate and disciplined population.

If one or more of these basic requirements are not met, a CPR will and cannot function properly. Under these circumstances, its introduction is not recommended.

In the case of Fiji, the introduction of such a comprehensive and sophisticated registration system has never seriously been considered. Nevertheless, the qualities of such a system have sometimes been discussed, usually prior to national elections. If an effective CPR had been in place in Fiji prior to the 2006 and previous elections, most of the problems that arose during these elections, particularly those connected with the incompleteness and other shortcomings of the electoral rolls could most likely have been avoided. A complete and accurate CPR guarantees an up to date electoral roll at all times and at no additional cost. Instead of blaming the Electoral Office, people not appearing on the electoral roll at any location in the country would be taken to task by the authorities over why they did not register a change in their usual place of residence at the local registration office.

1.2. Migration surveys

Detailed nationwide information concerning internal migration, especially with regard to the determinants and consequences of migration (push and pull factors at the place of origin as well as the place of destination), can only be obtained through an in depth migration survey, based on a representative sample of the population. Even the most sophisticated CPR cannot provide this information. Fiji has never conducted a comprehensive nationwide Migration Survey.[27] It should also be stressed that, like religion, migration tends to be a clustered variable in Fiji.[28]

Some small area studies (i.e. a village or squatter settlement) of which migration was a component, have been conducted. Their results only apply to the areas under investigation and provide no valid information at the national and provincial level.

1.3. Censuses

In the absence of a registration system of internal migration in Fiji, the census remains the main source of basic statistics concerning migration between the country's geographic subdivisions.

2. The census as a source of internal migration data

This section discusses some of the problems with internal migration data derived from a census. Next, it provides a brief overview of internal migration data provided by the early censuses until 1966 as well as the more recent censuses since 1976.

[27] Some economic surveys conducted by the FBoS in the past included a modest migration module. These modules offer a rather limited scope for migration analysis.

[28] Migration indices estimated from a sample survey with a design that uses large clusters will most likely provide a biased picture of migration.

2.1. Restrictions

There is only limited scope for the collection of data on migration by means of the interview method in a census. This section discusses some of the restrictions.

- Usual place of residence at a fixed point in the past versus duration of stay approach

  Contrary to statistics on internal migration provided by a registration system (like the CPR), censuses can only record the usual place of residence of respondents at (a) particular point(s) in time, for instance at the time of birth, at the time of the enumeration and at some well-defined time in the past. It is important to note, that, unlike a registration system, most censuses do not specify the time that migration took place. However, censuses that include an additional question concerning "duration of stay" of respondents at their usual place of residence will provide limited information about the exact time of migration.

  It has sometimes been argued that the "duration of stay" approach may lead to more accurate reporting on migration since it may be expected that respondents will remember their previous usual place of residence better than their usual place of residence at some arbitrary point in the past. However, the "duration of stay" approach has disadvantages as well. The most important one is the lack of a fixed reference period. For this and other reasons, censuses in Fiji (since 1976) have chosen the "usual place of residence at fixed points" approach. Census interview schedules in Fiji have never included a "duration of stay" question.

- Reference period

  Census information on internal migration in Fiji refers to a certain period of time. The length of this period depends on the difference in time between the reference points used in the census. For instance, in all recent censuses until 1996, the province of birth and province of enumeration of respondents was recorded. Respondents reporting a province of birth (B), that is different from their usual place of residence at the time of the enumeration (E), are lifetime inter-provincial migrants. Their migration can have taken place at any time between birth and the census.

  In recent censuses, the usual place of residence of respondents five years prior to the census (point X) was also recorded. In 2007, a respondent reporting a usual place of residence at point X (five years before the census) that is different from his/her usual place of residence at the time of the census is a recent interprovincial migrant. His/her migration can have taken place at any time during the five-year period.

- Delineation of spatial units

  Contrary to the boundaries of a country, which are, in most (if not all) cases, precisely defined, the delineation of precise and unambiguous boundaries for spatial units within a country, sometimes poses problems. Official administrative or political units are not always useful for the measurement of migration. Their boundaries do not always meet the clarity and unambiguousness criteria of the census. Examples of often unclear boundaries in Fiji include the boundaries of the "tikina makawa" as well as the

boundary of some towns, especially Nasinu. The delineation of administrative as well as statistical (census) areas in Fiji is discussed in detail in Appendix A.

- Size of spatial units and the study of migration

  The volume of migration changes with the size of the spatial units that are being used. In Fiji, the spatial units used in migration analysis are usually the official administrative/political units of the country: the division, province and "tikina vou". As mentioned, the most important sub-national unit for planning purposes in Fiji is the province. If migration analysis shifts from the divisional to the provincial or from the provincial to the tikina level, the volume of migration will increase very significantly. This implies that for meaningful comparison of migration over time, the same geographic units need to be used.

  It will be realized that, because of the above problems with specific cut-off points on the space and time continuum, the measurement of internal migration is, in most countries, largely unique.

- Characteristics of migrants

  The demographic and socio-economic characteristics of migrants are the characteristics at the time of the census and not at the time that migration took place.

On the other hand, the measurement of internal migration from census data also has some advantages compared to measurement from statistics produced by a registration system. Some of these include:

- The census provides a count of migrants whereas service statistics provide a count of moves.

- In census migration statistics, the impact of mortality is deducted in advance whereas in transit statistics it is possible that the migrant died after his/her move was recorded.

2.2. Early censuses until 1966

During all censuses before 1946, only the country of birth and place of enumeration of respondents was recorded. Consequently, information on internal migration of the indigenous population cannot be derived from these censuses.

Prior to the 1956 Census in Fiji, a blueprint of census taking in most former British colonies in the South Pacific Region was introduced. This blueprint, the 1956 Census interview schedule of Fiji, included amongst others the measurement of lifetime migration between the main official geographic subdivisions of the country. However, in the case of the ethnic Fijians, enumerators were instructed to record the province in which they were registered as landowner instead of the place of birth. Moreover, the 1956 Census Interview Schedule does not clarify that the place of birth of census respondents is, for census (migration) purposes defined as the usual place of residence of the mother at the time of birth of the respondents. In other words, there is very limited scope for the measurement of lifetime migration from

this census. The 1956 Census Report does not include a cross-classification of Province of Enumeration by Province of Birth.

During the 1966 Census, the place of birth of all respondents was recorded for the first time. As a result, the Census Report for that year includes a cross tabulation of the population by Province of Enumeration and Province of Birth, by sex and ethnicity. This is therefore the first census from which some information concerning movements within the country can be estimated. However, this information is restricted to lifetime migration. Any respondent whose place of enumeration is different from his/her province of birth is considered a lifetime migrant. It needs to be reiterated that the category lifetime migrants includes persons who have migrated many times during their lifetime. It is not feasible to collect this information in a census. Moreover, a person who migrated many times during his/her lifetime, but was enumerated at his/her place of birth will not be included in the lifetime migration statistics.[29]

2.3. "Modern" censuses since 1976

The pre-1976 censuses provide very limited scope for lifetime migration analysis. Apart from the problems already mentioned, the most important shortcoming of the migration data of these censuses is that they do not provide any information on recent migration (that is during the period immediately before the census). For policy makers and planners and most other users, information on recent migration is clearly more important than information on lifetime migration. The main improvement introduced in the 1976 Census is that it tries to address this problem.[30] All censuses, starting from 1976, include an additional question on the usual place of residence of all respondents at a fixed point in time not too long before the census. This makes it possible to estimate recent migration during a short and well-defined interval prior to the census.

Before this additional question was included on the 1976 Census interview schedule, there was considerable disagreement with regard to the exact wording of this question. A pretest established that respondents in Fiji are usually able to remember their usual place of residence at a specified past date if an important event took place on that date i.e. a major hurricane which affected the entire country. For obvious reasons, it is imperative that all respondents in the country know this important event and refer to the same event. In other words, it should be a national event known to everybody. After much discussion, the event that was finally chosen was Independence Day in October 1970. Since the date of the 1976 census was 13 September, the interval to which pre-census migration referred was slightly less than six years. This is an inconvenient interval for migration analysis.

During the 1986 census, the question referring to the usual place of residence at a fixed previous date was repeated. However, during this census the time of reference was not an important national event. Respondents were simply asked to report their usual place of residence on 31 August 1981. This is exactly five years before the 1986 Census.[31].

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[29] The 1966 Census Report includes an additional table on internal migration. This is the same table but restricted to the "adult" population (aged 15 and over). Most of the respondents in this age group are in the labour force. It will be noted that, in 1966, children under the age of 15 constituted almost 47 percent of the total population.

[30] This improvement was mainly made due to the efforts of Dr. A.C. Walsh, then Head of the Geography Department at the University of the South Pacific.

[31] Census date in 1986 was the 31st of August.

The 1996 and 2007 Censuses followed the 1986 strategy. Respondents were asked to report their usual place of residence during a reference point exactly five years before the census. The advantage of this approach is that the pre-census period to which recent migration refers is a period of exactly five years. For analytical purposes, this is convenient. Unfortunately, the reports of these censuses do not mention to what extent the 1986, 1996 and 2007 Census respondents had problems to remember their usual place of residence at a time exactly five years before these censuses. In this respect, an additional problem is once again that, during a census, information for all household members is often provided by a senior person in the household, usually the head of household or his/her spouse. These proxy-respondents may not know the usual place of residence of all household members five years before the census.

From the above data, recent migration parameters can be estimated. These parameters are not annual in-, out- and net migration rates, since the reference period for the recent migration data is five years. If it may be assumed that migration was evenly distributed over the five-year period, reasonably accurate annual rates may be obtained by dividing the number of migrants during the five-year period by five. However, the assumption of evenly distributed migration over a longer period is often not valid. Contrary to changes in the other demographic processes, (fertility and mortality), changes in migration seldom occur gradually. More often than not, migration trends change almost overnight in response to socio-economic, political and other push and pull factors. The enormous increase in the volume of international migration in Fiji after the coups is a clear demonstration of this.

In conclusion, since 1976, the potential for internal migration analysis based on census data has improved. Recent censuses provide a fairly comprehensive picture of the volume, pattern and trends in internal migration as well as limited information about the demographic and socio-economic characteristics of the different types of migrants. On the other hand, census data concerning migrants has certain limitations. These have been outlined in this section. It needs to be stressed again that it is not feasible to record multiple moves between two chosen reference points in a census. These multiple moves can only be established when a complete migration history is included in a comprehensive Migration Survey.

Finally, censuses are not designed to collect information on the causes (determinants) and consequences of migration. Once again, this information should be collected in a Migration Survey based on a representative sample of the population.

3. Census typology of migrants

In Section 2, it was explained that the 1976 and subsequent censuses recorded the usual place of residence of all respondents at a fixed reference point in time during the interval between birth and enumeration. During the latter three censuses (1986, 1996 and 2007), this point was defined as exactly five years prior to the census. From these three censuses, the following is known for all respondents who were age five and over at the time of these censuses:

- Place of birth, **(B).**
- Usual place of residence exactly five years before these censuses, **(X).**
- Place of enumeration, **(E).**

As mentioned, migration is defined as a change in usual place of residence. For statistical/census purposes, the place of birth of a respondent is therefore defined as the usual place of residence of the mother of the respondent at the time of his/her birth. Failure to apply this definition will result in a "delivery" bias in the migration statistics.

Until the 1996 Census, all respondents were enumerated at the place where they happened to be at census night. Their usual place of residence at the time of the census was not recorded.[32]. Since a certain proportion of all respondents were, during these censuses, not enumerated at their usual place of residence, but somewhere else in the country, the migration statistics based on this information contain a certain bias.

During the 2007 Census, it was attempted to address this problem. The Interview Schedule of this census included an additional question. All respondents covered under the "de-facto" rule were asked to answer the question:

"What is this person's usual place of residence?"(State province or country if outside Fiji)

Consequently, the migration statistics derived from the 2007 Census, should, at least in theory, provide a more accurate picture of internal migration than the previous censuses. Migration analysis of census data in Fiji, based on the usual place of residence at the above three points in time uses the typology of migrants presented in Figure IX-A1.The following comments refer to this typology.

- Migrants and non-migrants

  The populations age five and over at the time of the census consist of migrants and non-migrants. Non-migrants reported that their place of birth and their place of residence five years before the census (X) and at the time of enumeration (E) is the same:

  $$\mathbf{B = X = E}$$

- Past and recent migrants

  Those who have been classified as migrants are either past migrants or recent migrants. Past migrants moved between birth (B) and five years before the census (X), but not during the last five years before the census:

  $$\mathbf{B \neq X = E}$$

  This is therefore a restricted definition of past migrants.

  On the other hand, recent migrants moved during the five years before the census:

  $$\mathbf{X \neq E}$$

  In addition, they may also have moved between B and X. However, in order to be classified as a recent migrant this is not a necessary condition.

[32] All these censuses were pure de-facto censuses.

- One-time and multiple migrants

  Those who have been classified as recent migrants can be further subdivided into those who moved only one time (one-time migrants) and those who moved more than once (multiple migrants). One-time migrants moved during the last five years before the census but not before:

  $$\mathbf{B = X \neq E}$$

  Multiple migrants moved before as well as after point X:

  $$\mathbf{B \neq X \neq E}$$

- Return migrants and other multiple migrants

  Multiple migrants can be further subdivided into those who returned to their place of birth during the five years before the census (return migrants) and those who moved to another place than their birthplace during this five-year period (other multiple migrants).

  For return migrants

  $$\mathbf{B \neq X \neq E \text{ (whereas } B = E)}$$

  For the "other multiple migrants" or "frequent movers"

  $$\mathbf{B \neq X \neq E \text{ (whereas } B \neq E)}$$

- Lifetime migrants

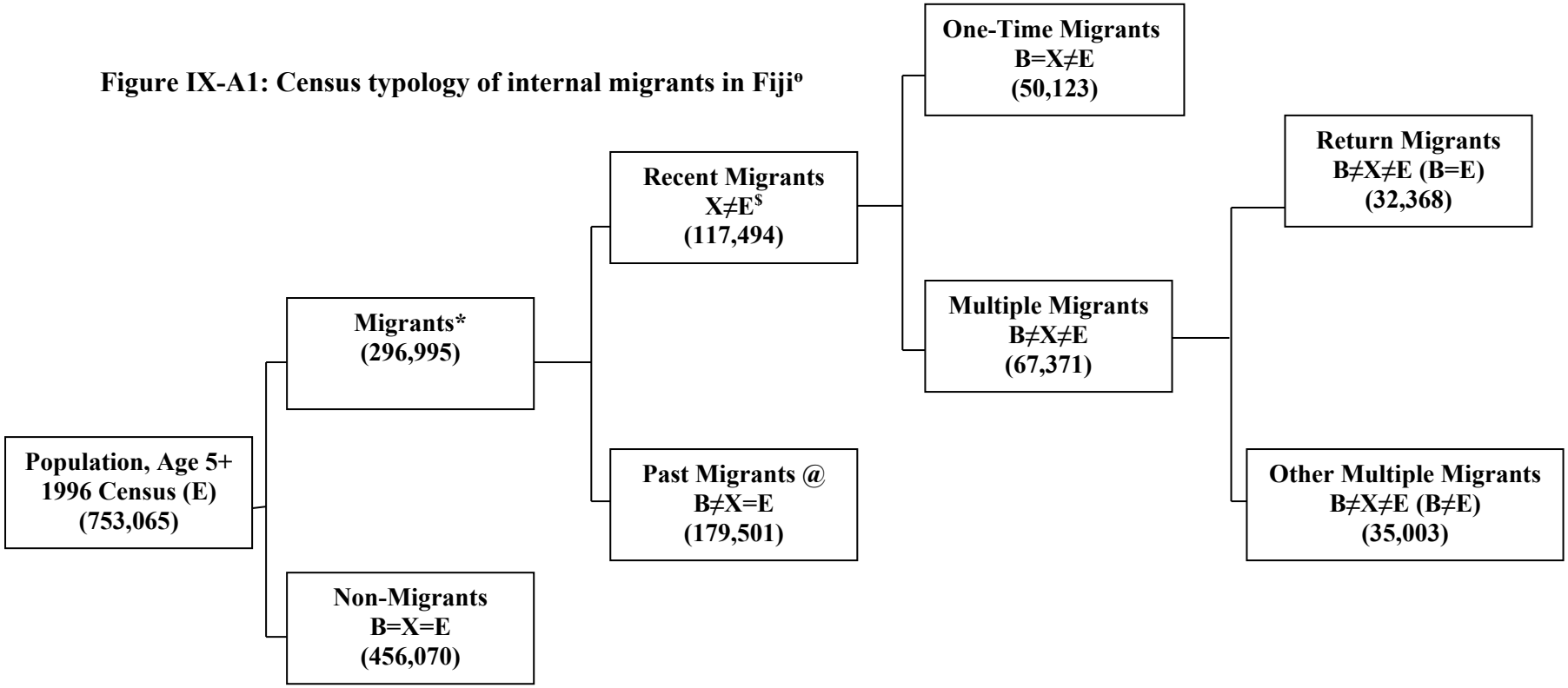
  It will be noted that "lifetime migrants" are not included in the typology of Figure IX-A1. The category "lifetime migrants" includes all those who reported that their place of birth and place of enumeration was not the same:

  $$\mathbf{B \neq E \text{ (irrespective of whereabouts at X)}}$$

  The category of lifetime migrants thus defined includes children under the age of five who "migrated" (most likely with their parents) during the period between birth and enumeration.

Figure IX-A1 presents the number of migrants age five and over in each of the above categories at the time of the 2007 as well as the 1996 Census. (The latter figures are shown in *italics* and in brackets). It needs to be stressed again, that these migrants are inter-provincial migrants. In other words, the spatial unit of reference used in this figure is the province. It will be realized that the numbers in Figure IX-A1 would be completely different if another spatial unit i.e. the division or the tikina vou were chosen as the unit of analysis instead of the province. It will also be noted that children under the age of five have been excluded since, five years before the census (X) they were not yet born.

Figure IX-A1: Census typology of internal migrants in Fiji[ø]



Type of Migant	1986+		1996∞		2007	
	Nr	%	Nr	%	Nr	%
Population Age 5 and over	**614,089**	**100.0**	**608,863**	**100.0**	**753,065**	**100.0**
1.Migrants	**215,076**	**35.0**	**248,657**	**36.5**	**296,995**	**39.4**
a. Recent Migrants	97,706	15.9	110,202	16.2	117,494	15.6
i. One-Time Migrants	53,226	8.7	59,550	8.7	50,123	6.7
ii. Multiple Migrants	44,480	7.2	50,652	7.4	67,371	8.9
.Return Migrants	18,470	3.0	20,918	3.1	32,368	4.3
.Other Multiple Migrants	26,010	4.2	29,734	4.4	35,003	4.6
b.Past Migrants	117,370	19.1	138,455	20.3	179,501	23.8
2. Non-Migrants	**399,013**	**65.0**	**432,206**	**63.5**	**456,070**	**60.6**

Notes:

ø The numbers (between brackets) in the diagram refer to inter-provincial migrants and non-migrants age five and over in 2007.

* Migrants are defined as all persons age five and over who migrated before and/or after point X (mid-2002).

$ Recent Migrants are defined as all persons age five and over who migrated after point X, irrespective of whether or not they migrated before point X.

@ These are past migrants in a narrow sense. They only migrated before point X and not after point X. Past migrants in a broad sense are all persons who migrated before point X and may or may not have migrated after point X. In this classification those who did migrate after point X are classified as recent migrants.

\+ The 1986 figures are from Chandra, 1989: p.89 (Table 7.3) or they have been derived from data in this table.

∞ Bakker, 2000: 49 (Figure IV-1)

4. Migration status

4.1. General

This section is concerned with the migration status of the population derived from the 2007 Census. It also provides a national level comparison of the migration status of the population in 1986 and 1996.

While interpreting the information in this section, the following should be kept in mind:

- The classification of migrants, presented in the previous Section 3, is used throughout this section. This implies that all information refers to the population age 5 and over since those under the age of 5 were not yet born at time X (five years before the census).

- The spatial reference unit in these tables is the province. In other words persons crossing a provincial boundary for the purpose of residing in another province are considered as inter-provincial migrants.

- In comparing the migration status of the population in 2007 with that at the time of the previous censuses in 1986 and 1996, users are again reminded that the 2007 Census provides somewhat more precise information on internal migration, since all three reference points (B, X and E) refer to the usual place of residence of respondents. In other words, all moves refer to a change in the usual place of residence. This is possible since the 2007 Census recorded the usual place of residence of all respondents at the time of the census. This was not the case during previous censuses, when only the place of enumeration of all respondents was recorded. This would make a person whose usual place of residence is Naitasiri Province but who was temporarily away from this province at the time of the 1996 Census, an inter-provincial migrant. Because of the additional question in 2007, it is now possible to restrict inter-provincial moves to changes in usual place of residence only.

4.2. Migration status in 2007 compared to that in 1996

In Table IX-1a-c, the internal migration status of all persons age 5 and over by sex, enumerated in the 2007 Census is presented. In these tables, the province is the geographic reference unit. This means that, in these tables, only those persons who changed their usual place of residence from one province to another are included in the category migrants. Persons who changed their usual place of residence from one tikina to another tikina in the same province are therefore not included as migrants, although they are inter-tikina migrants.

In the following comments, inter-provincial migration status in 2007 is compared to that in 1996. (1996 figures are shown in italics and within brackets).[33]

[33] The provincial boundaries were the same at the time of the recent censuses. This means that it is valid to compare inter-provincial migration derived from these censuses as long as the time reference is also the same. It is, however, important to realize that the boundaries of most urban areas [and subdivisions of urban areas] changed significantly after 1966, but especially during the 1996 urban boundary revision. During this revision, some urban area boundaries were extended very significantly since they had remained unchanged since 1966. In the meantime, in several cases considerable urban-type development had taken place just outside the 1966 boundaries.

- Of the total population age 5 and over, 39.4 percent (36.5 percent) migrated at least once in their life across a provincial boundary. This proportion is slightly higher than in 1996. As expected, the two most urbanized provinces, Naitasiri and Rewa have in 2007 as well as 1996 by far the largest proportion of inter-provincial migrants, viz. 60.6 percent (62.1 percent) and 56.4 percent (58.4 percent) respectively. Quite surprisingly, in 2007 as well as in 1996, Ba, the third most urbanized province has one of the lowest proportions of inter-provincial migrants of all provinces viz. 27.3 percent (22.9 percent).

- At the national level, there are 52.8 percent (25.6 percent) more past than recent migrants across a provincial boundary. Of the total population age 5 and over, 15.6 percent (16.2 percent) are recent inter-provincial migrants and 23.8 percent (20.3 percent) are past inter-provincial migrants. In 2007, all provinces, with the exception of Macuata and the two small 'rural' provinces, Kadavu and Lau have a higher number of past than of recent inter-provincial migrants.[34]

- Of all recent inter-provincial migrants, 42.7 percent (54.0 percent) migrated only during the five years before the 2007 Census. (One-time recent migrant). The remaining 57.3 percent (46.0 percent) are multiple migrants who migrated before as well as after 2002. In 2007, all provinces have a larger number of multiple migrants than of one-time recent migrants. In 1996, the situation was quite different. In that year seven provinces, viz. the most urbanized provinces Naitasiri, Rewa and Ba as well as Nadroga, Ra, Serua and Macuata had a higher number of one-time recent migrants than of multiple migrants.

- It will be noted that during the intercensal period, the proportion of inter-provincial return migrant has increased from 3.1 percent to 4.3 percent of the total population age five and over. In 2007, by far the highest number of return migrants was enumerated in Naitasiri, Rewa and Ba (A total of 16,666 persons or 51.5 percent of all inter-provincial return migrants). The proportion of return migrants (of the total population) in these three provinces is, however not very high, viz. 4.7 percent, 4.6 percent and 2.8 percent respectively. The fact that, in 2007, such a large proportion of all inter-provincial return migrants was born in the three most urbanized provinces Naitasiri, Rewa, and Ba and returned to these provinces during the five years prior to the 2007 Census may come as a bit of a surprise to students of return migration in Fiji. As in 1996, it seems that the category return migrants are dominated by persons born in an urban area who returned to their urban area of birth after 2002. In a very large number of cases this urban area is obviously the agglomeration Greater Suva (Suva, Nasinu and Lami). Finally, in 2007, the highest proportion of return migrants (5 percent or more of the total population) is found in Lau (7.8 percent), Serua (5.9 percent), Nadroga and Kadavu (both 5.5 percent), Tailevu, (5.3 percent), Namosi, (5.2 percent) and Cakaudrove (5.1 percent). It will be noted that these are provinces mainly inhabited by Fijians.[35] In fact, in 2007, 68.0 percent of all return migrants are Fijians and only 26.7 percent are Indians. (See Table VII-2a and b).

[34] In 2007, four provinces viz. Namosi, Kadavu, Lau and Rotuma do not (yet) have an urban area. Furthermore, Bua Province has only one very small urban area, Nabouwalu, which became an urban area for census/statistical purposes in 1996.

[35] In comparison, in 1996 the largest proportion of return migrants was enumerated in Rotuma (10.9 percent) and Lau (7.7 percent).

Table IX-A1a: Migration status of the population age five and over at the provincial level in 2007, Total population

Province of usual residence in 2007	Total Pop.@ Age 5+	Non-Migrants	Migrants*						
			Total Migrants	Recent Migrants					Past Migrants
				Total Rec. Migr.	One-time Rec. Migr.	Multiple Migrants			
						Total	Other	Return	
Total Fiji	**753,065**	**456,070**	**296,995**	**117,494**	**50,123**	**67,371**	**35,003**	**32,368**	**179,501**
Western Div.	**288,969**	**206,128**	**82,841**	**31,580**	**13,619**	**17,961**	**8,335**	**9,626**	**51,261**
- Ba	211,119	153,556	57,563	21,580	10,036	11,544	5,703	5,841	35,983
- Nadroga	50,819	33,589	17,230	6,954	2,331	4,623	1,804	2,819	10,276
- Ra	27,031	18,983	8,048	3,046	1,252	1,794	828	966	5,002
Central Div.	**304,216**	**137,515**	**166,701**	**63,304**	**27,867**	**35,437**	**20,695**	**14,742**	**103,397**
- Naitasiri	140,669	55,372	85,297	30,762	13,457	17,305	10,710	6,595	54,535
- Namosi	6,904	4,520	2,384	1,013	375	638	282	356	1,371
- Rewa	91,091	39,758	51,333	19,799	9,752	10,047	5,817	4,230	31,534
- Serua	15,258	7,451	7,807	3,352	1,222	2,130	1,232	898	4,455
- Tailevu	50,294	30,414	19,880	8,378	3,061	5,317	2,654	2,663	11,502
Northern Div.	**124,128**	**88,359**	**35,769**	**16,521**	**6,435**	**10,086**	**4,113**	**5,973**	**19,248**
- Bua	13,022	9,682	3,340	1,581	667	914	449	465	1,759
- Cakaudr.	44,654	30,818	13,836	5,636	2,030	3,606	1,319	2,287	8,200
- Macuata	66,452	47,859	18,593	9,304	3,738	5,566	2,345	3,221	9,289
Eastern Div.	**35,752**	**24,068**	**11,684**	**6,089**	**2,202**	**3,887**	**1,860**	**2,027**	**5,595**
- Kadavu	9,419	5,399	4,020	2,154	810	1,344	829	515	1,866
- Lau	10,116	7,456	2,660	1,815	610	1,205	414	791	845
- Lomaiviti	14,264	9,933	4,331	1,823	665	1,158	534	624	2,508
- Rotuma	1,953	1,280	673	297	117	180	83	97	376

@ Excludes 1,489 persons whose usual place of residence in 2007 was outside Fiji. Of these, 1,127 are "Others".
* Includes those residents whose province of birth and province of usual residence in 2002 was overseas.

Table IX-A1b: Migration status of the male population age five and over at the provincial level, 2007

Province of usual residence in 2007	Total Pop.@ Age 5+	Non-Migrants	Migrants*						
			Total Migrants	Recent Migrants					Past Migrants
				Total Rec. Migr.	One-time Rec. Migr.	Multiple Migrants			
						Total	Other	Return	
Total Fiji	**383559**	**243275**	**140284**	**58540**	**25318**	**33222**	**16667**	**16555**	**81744**
Western Div.	**147602**	**109557**	**38045**	**15808**	**6975**	**8833**	**4021**	**4812**	**22237**
- Ba	107532	80434	27098	10796	5184	5612	2758	2854	16302
- Nadroga	26220	18535	7685	3526	1195	2331	866	1465	4159
- Ra	13850	10588	3262	1486	596	890	397	493	1776
Central Div.	**153652**	**74236**	**79416**	**31054**	**13921**	**17133**	**9716**	**7417**	**48362**
- Naitasiri	70399	29448	40951	14682	6709	8153	5083	3070	26089
- Namosi	3585	2530	1055	521	190	331	139	192	534
- Rewa	45678	20992	24686	9629	4905	4724	2704	2020	15057
- Serua	7692	4174	3518	1603	590	1013	554	459	1915
- Tailevu	26298	17092	9206	4439	1527	2912	1236	1676	4767
Northern Div.	**63461**	**46249**	**17212**	**8532**	**3262**	**5270**	**2048**	**3222**	**8680**
- Bua	6819	5374	1445	793	329	464	207	257	652
- Cakaudr.	23309	16543	6766	2991	1030	1961	697	1264	3775
- Macuata	33333	24332	9001	4748	1903	2845	1144	1701	4253
Eastern Div.	**18844**	**13233**	**5611**	**3146**	**1160**	**1986**	**882**	**1104**	**2465**
- Kadavu	5033	3093	1940	1093	438	655	374	281	847
- Lau	5321	3972	1349	967	317	650	211	439	382
- Lomaiviti	7456	5475	1981	931	346	585	255	330	1050
- Rotuma	1034	693	341	155	59	96	42	54	186

@ Excludes males whose usual place of residence in 2007 was outside Fiji.
* Includes those residents whose province of birth and province of usual residence in 2002 was overseas.

Table IX-A1c: Migration status of the female population age five and over at the provincial level, 2007

Province of usual residence in 2007	Total Pop.@ Age 5+	Non-Migrants	Migrants*						
			Total Migrants	Recent Migrants					Past Migrants
				Total Rec. Migr.	One-time Rec. Migr.	Multiple Migrants			
						Total	Other	Return	
Total Fiji	**369506**	**212795**	**156711**	**58954**	**24805**	**34149**	**18336**	**15813**	**97757**
Western Div.	**141367**	**96571**	**44796**	**15772**	**6644**	**9128**	**4314**	**4814**	**29024**
- Ba	103587	73122	30465	10784	4852	5932	2945	2987	14681
- Nadroga	24599	15054	9545	3428	1136	2292	938	1354	6117
- Ra	13181	8395	4786	1560	656	904	431	473	3226
Central Div.	**150564**	**63279**	**87285**	**32250**	**13946**	**18304**	**10979**	**7325**	**55035**
- Naitasiri	70270	25924	44346	15900	6748	9152	5627	3525	28446
- Namosi	3319	1990	1329	492	185	307	143	164	837
- Rewa	45413	18766	26647	10170	4847	5323	3113	2210	16477
- Serua	7566	3277	4289	1749	632	1117	678	439	2540
- Tailevu	23996	13322	10674	339	1534	2405	1418	987	6735
Northern Div.	**60667**	**42110**	**18557**	**7989**	**3173**	**4816**	**2065**	**2751**	**10568**
- Bua	6203	4308	1895	788	338	450	242	208	1107
- Cakaudr.	21345	14275	7070	2645	1000	1645	622	1023	4425
- Macuata	33119	23527	9592	4556	1835	2721	201	1520	5036
Eastern Div.	**16908**	**10835**	**6073**	**2943**	**1042**	**1901**	**978**	**923**	**3130**
- Kadavu	4386	2306	2080	1061	372	689	455	234	1019
- Lau	4795	3484	1311	848	293	555	203	352	463
- Lomaiviti	6808	4458	2350	892	319	573	279	294	1458
- Rotuma	919	587	332	142	58	84	41	43	190

@ Excludes females whose usual place of residence in 2007 was outside Fiji.
* Includes those residents whose province of birth and province of usual residence in 2002 was overseas.

Table IX-A2a: Migration status of the Fijian population age five and over at the provincial level in 2007

Province of usual residence in 2007	Total Pop.@ Age 5+	Non-Migrants	Migrants*						
			Total Migrants	Recent Migrants					Past Migrants
				Total Rec. Migr.	One-time Rec. Migr.	Multiple Migrants			
						Total	Other	Return	
Total Fiji	**420253**	**245719**	**174534**	**72761**	**28038**	**44723**	**22725**	**21998**	**101773**
Western Div.	**84916**	**53474**	**31442**	**12294**	**5891**	**6403**	**3815**	**2588**	**19148**
- Ba	133002	86691	46311	19172	8182	10990	5696	5294	27139
- Nadroga	29821	19990	9831	4637	1450	3187	1249	1938	5194
- Ra	18265	13227	5038	2241	841	1400	632	768	2797
Central Div.	**187418**	**91537**	**95881**	**37487**	**13713**	**23774**	**12487**	**11287**	**58394**
- Naitasiri	**80530**	**33471**	**47059**	**18080**	**6795**	**11285**	**6221**	**5064**	**28979**
- Namosi	5763	4093	1670	741	223	518	200	318	929
- Rewa	55789	26624	29165	10528	4133	6395	3421	2974	18637
- Serua	9411	4574	4837	2234	783	1451	828	623	2603
- Tailevu	35925	22775	13150	5904	1779	4125	1817	2308	7246
Northern Div.	**67466**	**45468**	**21998**	**10653**	**4237**	**6416**	**2872**	**3544**	**11345**
- Bua	10209	7750	2459	1224	522	702	384	318	1235
- Cakaudr.	32509	23889	8620	3834	1165	2669	903	1766	4786
- Macuata	24748	13829	10919	5595	2550	3045	1585	1460	5324
Eastern Div.	**32367**	**22023**	**10344**	**5449**	**1906**	**3543**	**1670**	**1873**	**4895**
- Kadavu	9191	5334	3857	2027	751	1276	775	501	1830
- Lau	9997	7418	2579	1753	578	1175	399	776	826
- Lomaiviti	13058	9260	3798	1597	535	1062	466	596	2201
- Rotuma	121	11	110	72	42	30	30	0	38

@ Excludes 46 Fijians whose usual place of residence in 2007 was outside Fiji.

* Includes those residents whose province of birth and province of usual residence in 2002 was overseas.

Table IX-A2 b: Migration status of the Indian population age five and over at the provincial level in 2007.

Province of usual residence in 2007	Total Pop.@ Age 5+	Non-Migrants	Migrants*						
			Total Migrants	Recent Migrants					Past Migrants
				Total Rec. Migr.	One-time Rec. Migr.	Multiple Migrants			
						Total	Other	Return	
Total Fiji	**290952**	**192324**	**98628**	**34067**	**13316**	**20751**	**12099**	**8652**	**64561**
Western Div.	**147032**	**115642**	**31390**	**10240**	**4228**	**6012**	**1990**	**4022**	**21150**
- Ba	118501	96706	21795	7528	3152	4376	1399	2977	14267
- Nadroga	20031	13268	6763	2000	714	1286	434	852	4763
- Ra	8500	5668	2832	712	362	350	157	193	2120
Central Div.	**93693**	**37774**	**55919**	**19006**	**7236**	**11770**	**9154**	**2616**	**36913**
- Naitasiri	52266	19354	32912	10649	2946	7703	6451	1252	22263
- Namosi	816	291	525	204	126	78	56	22	321
- Rewa	22533	8297	14236	5217	2784	2433	1667	766	9019
- Serua	4856	2626	2230	791	297	494	254	240	1439
- Tailevu	13222	7206	6016	2145	1083	1062	726	336	3871
Northern Div.	**49663**	**38667**	**10996**	**4642**	**1742**	**2900**	**908**	**1992**	**6354**
- Bua	2266	1561	705	268	110	158	108	50	437
- Cakaudr.	7280	3776	3504	1160	677	483	242	241	2344
- Macuata	40117	33330	6787	3214	955	2259	558	1701	3573
Eastern Div.	**564**	**241**	**323**	**179**	**110**	**69**	**47**	**22**	**144**
- Kadavu	29	13	16	13	2	11	10	1	3
- Lau	68	27	41	33	17	16	4	12	8
- Lomaiviti	444	199	245	120	81	39	30	9	125
- Rotuma	23	2	21	13	10	3	3	0	8

@ Excludes 316 Indians whose usual place of residence in 2007 was outside Fiji.

* Includes those residents whose province of birth and province of usual residence in 2002 was overseas.

- In 2007, the number of female inter-provincial migrants is 11.7 percent higher than the number of male inter-provincial migrants. This proportion is the same as in 1996 (11.7 percent). It will be noted that, as in 1996, this difference is almost entirely due to an excess of female past migrants. The number of males and females in the category recent migrants is approximately the same. (See Table IX-A2a and b)

- At the provincial level the same marked difference with regard to migration status exists between the two main ethnic components as in 1996. Of all ethnic Fijians age 5 and over, 41.5 percent (41.2 percent) are inter-provincial migrants whereas the comparable figure for the Indians is only 33.9 percent (28.6 percent). In other words, in 2007, Fijians are still much more likely to become inter-provincial migrants, but the Indians are catching up. (See Table IX-A2a and b)

Finally, Table IX-A3 provides a comparison of the migration status of the population at the time of the last three censuses.

Table IX-A3: Comparison of the migration status of the total population in 2007, 1996 and 1986

Type of Migrants	2007		1996		1986	
	Number	Percent	Number	Percent	Number	Percent
Population age 5 and over	753,065	100.0	680,863	100.0	614,089	100.0
1. Migrants	296,995	39.4	248,657	36.5	215,076	35.0
a. Recent migrants	117,494	15.6	110,202	16.2	97,706	15.9
(1) One-time migrants	50,123	6.7	59,550	8.7	53,226	8.7
(2) Multiple migrants	67,371	8.9	50,652	7.4	44,480	7.2
• **Return migrants**	32,368	4.3	20,918	3.1	18,470	3.0
• **Other mult. Migrants**	35,003	4.6	29,734	4.4	26,010	4.2
b. Past migrants	179,501	23.8	138,455	20.3	117,370	19.1
2. Non-migrants	456,070	60.6	432,206	63.5	399,013	65.0

Source: The 1986 figures have been derived from Chandra, 1989:89 (Table 7.3). The 1996 figures are from Bakker, 2000:49 (figure IV-1).

Since 1986, the proportion of respondents classified as migrants has increased marginally. However, this is entirely due to an increase in the proportion of past migrants. After 1996, the proportion of recent migrants has actually decreased somewhat. The main somewhat unexpected change between 1996 and 2007 is the increase in the proportion of return migrants. These return migrants are mainly Fijians.

5. In-, out- and net-migration at the provincial level

This section is concerned with in-, out- and net-migration at the provincial level. Section 5.1 deals with lifetime migration of the total population between birth [B] and the 2007 Census [E] and Section 5.2 with recent migration of the population age 5 and over between 2002 [X] and the 2007 Census [E].

5.1. Lifetime in-, out- and net-migration.

Table IX-A4a-c presents lifetime in-, out- and net-migration of the total population by sex and ethnicity between the provinces. Users are reminded that the category lifetime migrants, as defined in this chapter, include migrating children under the age of five. At the national level, the number of inter-provincial in- and out-migrants is the same. A person who is an in-migrant in a particular province is an out-migrant from another province. Consequently, net-migration at the national level is nil.

Table IX-A4a: Lifetime in-, out- and net-migration of the total population by sex at the provincial level in 2007

Province of usual residence in 2007	Lifetime In-Migration			Lifetime Out-Migration			Lifetime Net-Migration		
	P	M	F	P	M	F	P	M	F
Total Fiji	**278229**	**130735**	**147494**	**278229**	**130735**	**147494**	**0**	**0**	**0**
Western Div.	**76432**	**34884**	**41548**	**70790**	**31852**	**38938**	**5642**	**3032**	**2610**
- Ba	53820	25321	28499	37881	17106	20775	15939	8215	7724
- Nadroga	15125	6577	8548	18475	8237	10238	-3350	-1660	-1690
- Ra	7487	2986	4501	14434	6509	7925	-6947	-3523	-3424
Central Div.	**158031**	**75128**	**82903**	**91771**	**42744**	**49027**	**66260**	**32384**	**33876**
- Naitasiri	81719	39399	42320	23737	11041	12696	57982	28358	29624
- Namosi	2154	925	1229	3080	1365	1715	-926	-440	-486
- Rewa	48670	23515	25155	38352	18470	19882	10318	5045	5273
- Serua	7287	3245	4042	4932	2117	2815	2355	1128	1227
- Tailevu	18201	8044	10157	21670	9751	11919	-3469	-1707	-1762
Northern Div.	**32123**	**15188**	**16935**	**62921**	**29951**	**32970**	**-36798**	**-14763**	**-16035**
- Bua	3113	1312	1801	10115	4790	5325	-7002	-3478	-3524
- Cakaudrove	12610	6032	6578	20529	9553	10976	-7919	-3521	-4398
- Macuata	16400	7844	8556	32277	15608	16669	-15877	-7764	-8113
Eastern Div.	**10904**	**5164**	**5740**	**40530**	**19658**	**20872**	**-29626**	**-14494**	**-15132**
- Kadavu	4083	1954	2129	9826	4822	5004	-5743	-2868	-2875
- Lau	2129	1051	1078	16446	7948	8498	-14317	-6897	-7420
- Lomaiviti	4043	1832	2211	11673	5572	6101	-7630	-3740	-3890
- Rotuma	649	327	322	2585	1316	1269	-1936	-989	-947
Outside Fiji	739	371	368	12217	6530	5687	-11478	-6159	-5319

The following comments refer to the information in Table IX-A4a, b and c. The figures between brackets refer to 1996.

- The 2007 data shows that, as in 1996, four provinces, viz. Naitasiri, Ba, Rewa and Serua experienced positive inter-provincial lifetime net-migration. In 2007, the position of Naitasiri remains as dominant as it already was in 1996. In 2007 this province accounts for a very large proportion of all the inter-provincial in-migrants, viz. 29.4 percent (30.0 percent). Most of these migrants to Naitasiri Province undoubtedly moved to the Nasinu urban area where the majority of the population of this province resides.

- In 2007, the province with the second highest level of positive inter-provincial net-migration is Ba. Most of these migrants arrived during the 1996-2007 intercensal period. In 1996, the difference between the numbers of interprovincial in- and out-migrants in Ba was only marginal.

Table IX-A4b and c: Lifetime in-, out- and net-migration of Fijians and Indians by sex at the provincial level in 2007

Province of usual residence in 2007	Lifetime In-Migration			Lifetime Out-Migration			Lifetime Net-Migration		
	P	M	F	P	M	F	P	M	F
b : F i j i a n s									
Total Fiji	**161,651**	**76,322**	**85,329**	**16,1651**	**76,322**	**85,329**	**0**	**0**	**0**
Western Div.	**43,267**	**20,459**	**22,808**	**32,304**	**14,878**	**17,426**	**10,963**	**5,581**	**5,382**
- Ba	30,270	14,578	15,692	17,039	8,022	9,017	13,231	6,556	6,675
- Nadroga	8,391	3,856	4,535	7,889	3,494	4,395	502	362	140
- Ra	4,606	2,025	2,581	7,376	3,362	4,014	-2,770	-1,337	-1,433
Central Div.	**88,733**	**41,620**	**47,113**	**62,173**	**29,217**	**32,956**	**26,560**	**12,403**	**14,157**
- Naitasiri	43,963	20,829	23,134	16,429	7,833	8,596	27,534	12,996	14,538
- Namosi	1,451	572	879	2,463	1,087	1,376	-1,012	-515	-497
- Rewa	27,171	12,986	14,185	25,329	12,082	13,247	1,842	904	938
- Serua	4,519	2,053	2,466	2,886	1,310	1,576	1,633	743	890
- Tailevu	11,629	5,180	6,,449	15,066	6,905	8,161	-3,437	-1,725	-1,712
Northern Div.	**20,006**	**9,737**	**10,269**	**30,397**	**14,324**	**16,073**	**-10,391**	**-4,587**	**-5,804**
- Bua	2,247	1,022	1,225	6,375	3,035	3,340	-4,128	-2,013	-2,115
- Cakaudrove	7,621	3,756	3,865	14,970	6,955	8,015	-7,349	-3,199	-4,150
- Macuata	10,138	4,959	5,179	9,052	4,334	4,718	1,086	625	461
Eastern Div.	**9,596**	**4,481**	**5,115**	**35,140**	**16,847**	**18,293**	**-25,544**	**-12,366**	**-13,178**
- Kadavu	3,920	1,863	2,057	8,784	4,244	4,540	-4,864	-2,381	-2,483
- Lau	2,050	1,012	1,038	15,723	7,576	8,147	-13,673	-6,564	-7,109
- Lomaiviti	3,505	1,550	1,955	10,473	4,945	5,528	-6,968	-3,395	-3,573
- Rotuma	121	56	65	160	82	78	-39	-26	-13
Outside Fiji	49	25	24	1,637	1,056	581	-1588	-1,031	-557
c : I n d i a n s									
Total Fiji	**92,780**	**42,317**	**50,463**	**92,780**	**42,317**	**50,463**	**0**	**0**	**0**
Western Div.	**28,129**	**11,814**	**16,315**	**35,932**	**15,723**	**20,209**	**-7,803**	**-3,909**	**-3,894**
- Ba	19,337	8,577	10,760	18,894	8,148	10,746	443	429	14
- Nadroga	6,095	2,366	3,729	10,210	4,543	5,667	-4,115	-2,177	-1,938
- Ra	2,697	871	1,826	6,828	3,032	3,796	-4,131	-2,161	-1,970
Central Div.	**54,576**	**26,059**	**28,517**	**23,647**	**10,517**	**13,130**	**30,929**	**15,542**	**15,387**
- Naitasiri	32,455	15,902	16,553	5,988	2,563	3,425	26,467	13,339	13,128
- Namosi	524	247	277	516	228	288	8	19	-11
- Rewa	13,731	6,600	7,131	9,162	4,421	4,741	4,569	2,179	2,390
- Serua	2,031	792	1,239	1,807	678	1,129	224	114	110
- Tailevu	5,835	2,518	3,317	6,174	2,627	3,547	-339	-109	-230
Northern Div.	**9,487**	**4,138**	**5,349**	**28,843**	**13,845**	**14,998**	**-19,356**	**-9,707**	**-9,649**
- Bua	697	204	493	3,355	1,574	1,781	-2,658	-1,370	-1,288
- Cakaudrove	3,410	1,496	1,914	3,437	1,559	1,878	-27	-63	36
- Macuata	5,380	2,438	2,942	22,051	10,712	11,339	-16,671	-8,274	-8,397
Eastern Div.	**322**	**171**	**151**	**2,032**	**1,073**	**959**	**-1,710**	**-902**	**-808**
- Kadavu	15	9	6	*	*	*	*	*	*
- Lau	29	17	12	*	*	*	*	*	*
- Lomaiviti	253	127	126	*	*	*	*	*	*
- Rotuma	25	18	7	*	*	*	*	*	*
Outside Fiji	**266**	**135**	**131**	**2,326**	**1,159**	**1,167**	**-2,060**	**-1,024**	**-1,036**

Note * The number of Indians in these provinces is very small.

- In 2007 (as in 1996), a significant proportion of all inter-provincial in-migrants moved to Rewa Province. The figures for this province are, however; significantly lower than in the case of Naitasiri Province, viz. 17.5 percent (18.9 percent) of all inter-provincial migrants moved to Rewa Province. However, contrary to 1996, when inter-provincial net-migration to this province was almost nil, out-migration from this province, though still very substantial, has decreased significantly. With regards to the future, it will be realized that there is little scope for further extension of the Suva Urban Area into Rewa Province. Since the Urban Area Suva was created in 1966, virtually all further extensions of this UA were in Naitasiri Province.

- In 2007, as in 1996, all provinces, except Naitasiri, Ba, Rewa and Serua, experienced more out- than in-migration. This includes all provinces in the Northern and Central Division. Net losses for all seven provinces of these divisions were already very severe in 1996 and they have become even more severe in 2007. In 1996, by far the most substantial loss of population was experienced by Lau Province. In 2007, lifetime net-migration from this province is even higher than it was in 2007. However, lifetime net-migration loss for Macuata in 2007 is even higher than that for Lau.

- Overall, females remain about 13 percent more affected by inter-provincial lifetime migration than males.

- The Fijian population remains far more affected by in- as well as out-migration than the Indian population and this applies to males as well as females. In 2007, there were almost 70,000 more Fijian than Indian lifetime interprovincial migrants in Fiji.

- With regard to the Indian population, in 2007, four provinces, Naitasiri, Rewa, Serua and Ba experienced more lifetime in- than out-migration. However Naitasiri remains, with 35 percent of all Indian in-migrants, the main province of destination for Indians. In 2007, Macuata has become the province with the largest number of Indian out-migrants (23.8 percent of all Indian out-migrants) followed by Ba, Nadroga and Rewa.

5.2. Recent in-, out- and net-migration

Table IX-A5a-c presents recent (during the five years prior to the 2007 Census) in-, out- and net-migration by sex and ethnicity at the provincial level. Once again, the data refers to the population age five and over. It appears that, in 2007, the total number of recent inter-provincial migrants (in- as well as out) is 42.5 percent of the total number of lifetime inter-provincial migrants. This proportion is almost the same as in 1996 (42.7 percent).

In 1996, the pattern of recent and lifetime migration at the provincial level was quite similar. In 2007, the situation has slightly changed. Although Naitasiri, Rewa and Serua (which are provinces of positive lifetime net-migration), are also provinces of positive recent net-migration, they are joined by Tailevu. This change is amongst others due to growth in and around the Urban Area of Nausori i.e. in the Lakena subdivision.[36] In other words, in 2007, all provinces in the Central Division, except Namosi, have become provinces of positive recent net-migration.

[36] This is the area of the former irrigation scheme.

Table IX-A5a: Recent in-, out- and net-migration of the population age five and over by sex at the provincial level in 2007

Province of usual residence in 2007	Recent In-Migration			Recent Out-Migration			Recent Net-Migration		
	P	M	F	P	M	F	P	M	F
Total Fiji	**118,126**	**58,877**	**59,249**	**11,8126**	**58,877**	**59,249**	**0**	**0**	**0**
Western Div.	**31,580**	**15,808**	**15,772**	**30,026**	**14,839**	**15,187**	**1,554**	**969**	**585**
- Ba	21,580	10,796	10,784	19,505	9,671	9,834	2,075	1,125	950
- Nadroga	6,954	3,526	3,428	6,118	2,939	3,179	836	587	249
- Ra	3,046	1,486	1,560	4,403	2,229	2,174	-1,357	-743	-614
Central Div.	**63,304**	**31,054**	**32,250**	**44,858**	**22,105**	**22,753**	**18,446**	**8,949**	**9,497**
- Naitasiri	30,762	14,862	15,900	17,365	8,505	8,860	13,397	6,357	7,040
- Namosi	1,013	521	492	1,082	546	536	-69	-25	-44
- Rewa	19,799	9,629	10,170	17,714	8,751	8,963	2,085	878	1,207
- Serua	3,352	1,603	1,749	2,013	955	1,058	1,339	648	691
- Tailevu	8,378	4,439	3,939	6,684	3,348	3,336	1,694	1,091	603
Northern Div.	**16,521**	**8,532**	**7,989**	**23,494**	**11,857**	**11,637**	**-6,973**	**-3,325**	**-3,648**
- Bua	1,581	793	788	3,625	1,813	1,812	-2,044	-1,020	-1,024
- Cakaudrove	5,636	2,991	2,645	6,993	3,534	3,459	-1,357	-543	-814
- Macuata	9,304	4,748	4,556	12,876	6,510	6,366	-3,572	-1,762	-1,810
Eastern Div.	**6,089**	**3,146**	**2,943**	**9,195**	**4,576**	**4,619**	**-3,106**	**-1430**	**-1676**
- Kadavu	2,154	1,093	1,061	3,381	1,693	1,688	-1,227	-600	-627
- Lau	1,815	967	848	2,346	1,185	1,161	-531	-218	-313
- Lomaiviti	1,823	931	892	3,052	1,486	1,566	-1,229	-555	-674
- Rotuma	297	155	142	416	212	204	-119	-57	-62
Outside Fiji	632	337	295	10,553	5,500	5,053	9,921	-5,163	-4,758

Some change has also occurred in the Western Division where Nadroga has now joined the provinces with positive recent net-migration. All provinces in the Northern and Eastern Division have remained provinces with negative recent net-migration.

In the previous section it was noted that in 2007 as well as 1996, there are about 13 percent more female than male lifetime migrants. In both years, there are slightly more female than male recent migrants.

Finally, the figures indicate that the number of Fijians who are recent migrants is more than twice the number of recent Indian migrants. The internal migration gap between Fijians and Indians remains as wide as it was in 1996.

Table IX-A5b and c: Recent in-, out- and net-migration of Fijians and Indians age 5 and over by sex at the provincial level, 2007 Census

Province of usual residence in 2007	Recent In-Migration			Recent Out-Migration			Recent Net-Migration		
	P	M	F	P	M	F	P	M	F
b : F i j i a n s									
Total Fiji	**72,799**	**36,259**	**36,540**	**72,799**	**36,259**	**36,540**	**0**	**0**	**0**
Western Div.	**19,172**	**9,726**	**9,446**	**19,115**	**9,549**	**9,566**	**57**	**177**	**-120**
- Ba	12,294	6,236	6,058	12,847	6,418	6,429	-553	-182	-371
- Nadroga	4,637	2,370	2,267	3,514	1,709	1,805	1,123	661	462
- Ra	2,241	1,120	1,121	2,754	1,422	1,332	-513	-302	-211
Central Div.	**37,487**	**18,143**	**19,344**	**30,898**	**15,208**	**15,690**	**6,589**	**2,935**	**3,654**
- Naitasiri	18,080	8,510	9,570	11,727	5,777	5,950	6,353	2,733	3,620
- Namosi	741	374	367	888	446	442	-147	-72	-75
- Rewa	10,528	4,977	5,551	11,847	5,748	6,099	-1,319	-771	-548
- Serua	2,234	1,044	1,190	1,353	650	703	881	394	487
- Tailevu	5,904	3,238	2,666	5,083	2,587	2,496	821	651	170
Northern Div.	**10,653**	**5,581**	**5,072**	**12,290**	**6,222**	**6,068**	**-1,637**	**-641**	**-996**
- Bua	1,224	630	594	2,613	1,311	1,302	-1,389	-681	-708
- Cakaudrove	3,834	2,055	1,779	5,125	2,609	2,516	-1,291	-554	-737
- Macuata	5,595	2,896	2,699	4,552	2,302	2,250	1,043	594	449
Eastern Div.	**5,449**	**2,789**	**2,660**	**7,558**	**3,727**	**3,831**	**-2,109**	**-938**	**1,171**
- Kadavu	2,027	1,022	1005	2611	1,293	1,318	-584	-271	-313
- Lau	1,753	930	823	2,141	1,073	1,068	-388	-143	-245
- Lomaiviti	1,597	801	796	2,724	1,316	1,408	-1,127	-515	-612
- Rotuma	72	36	36	82	45	37	-10	-9	-1
Outside Fiji	38	20	18	2,938	1,553	1,385	-2,900	-1,533	-1,367
c : I n d i a n s									
Total Fiji	**34,315**	**16,901**	**17,414**	**34,315**	**16,901**	**17,414**	**0**	**0**	**0**
Western Div.	**10,,240**	**4,942**	**5,298**	**9,572**	**4,583**	**4,989**	**668**	**359**	**309**
- Ba	7528	3,645	3,883	5,633	2,725	2,908	1,895	920	975
- Nadroga	2,000	980	1,020	2,427	1,133	1,294	-427	-153	-274
- Ra	712	317	395	1,512	725	787	-800	-408	-392
Central Div.	**19,006**	**9,408**	**9,598**	**10,630**	**5,185**	**5,445**	**8,376**	**4,223**	**4,153**
- Naitasiri	10,649	5,332	5,317	4,454	2,148	2,306	6,195	3,184	3,011
- Namosi	204	103	101	121	65	56	83	38	45
- Rewa	5,217	2,564	2,653	4,200	2,121	2,079	1,017	443	574
- Serua	791	367	424	469	207	262	322	160	162
- Tailevu	2,145	1,042	1,103	1,386	644	742	759	398	361
Northern Div.	**4,642**	**2,316**	**2,326**	**9,853**	**4,950**	**4,903**	**-5,211**	**-2,634**	**-2,577**
- Bua	268	117	151	848	416	432	-580	-299	-281
- Cakaudrove	1,160	596	564	1,215	603	612	-55	-7	-48
- Macuata	3,214	1,603	1,611	7,790	3,931	3,859	-4,576	-2,328	-2,248
Eastern Div.	**179**	**112**	**67**	**1,043**	**553**	**490**	**-864**	**-441**	**-423**
- Kadavu	13	7	6	*	*	*	*	*	*
- Lau	33	23	10	*	*	*	*	*	*
- Lomaiviti	120	73	47	*	*	*	*	*	*
- Rotuma	13	9	4	*	*	*	*	*	*
Outside Fiji	248	123	125	3,217	1,630	1,587	-2,969	-1,507	-1,462

Note * The number of Indians in these provinces is very small.

5.3. Recent inter-provincial net-migration rates

For the production of population projections at the provincial level, net-migration rates for each of the provinces are required. These rates by sex and ethnicity are presented in Table IX-A6a-c. In calculating these rates, the 2007 Census population has been used as the denominator. Moreover, since the numerators, the in-, out- and net-migration figures in Section 6.2 refer to a period of five years, the five-year rates have been divided by five in order to obtain annual rates.

Table IX-A6a: Recent in-, out- and net-migration rates per year (‰) at the provincial level for the total population age five and over by sex based on 2007 Census data

Division/ Province	In-migration rates (‰)			Out-migration rates (‰)			Net-migration rates (‰)		
	P	M	F	P	M	F	P	M	F
Fiji	**31**	**31**	**32**	**31**	**31**	**32**	**0**	**0**	**0**
Provinces in the Western Division									
-Ba	20	20	21	19	18	19	2	2	2
-Nadroga	26	26	27	23	22	25	3	4	2
-Ra	23	22	24	33	33	34	-10	-11	-10
Provinces in the Central Division									
-Naitasiri	43	41	44	24	24	24	19	18	19
-Namosi	34	33	34	36	35	37	-2	-2	-3
-Rewa	43	42	44	39	38	39	5	4	5
-Serua	41	39	44	25	23	26	17	16	17
-Tailevu	34	34	33	27	26	28	7	8	5
Provinces in the Northern Division									
-Bua	25	24	27	58	56	61	-33	-31	-35
-Cakaudrove	26	26	26	32	31	33	-6	-5	-8
-Macuata	28	29	28	39	39	39	-11	-11	-11
Provinces in the Eastern Division									
-Kadavu	49	46	51	76	72	82	-28	-25	-30
-Lau	39	38	39	50	46	54	-11	-9	-15
-Lomaiviti	25	25	26	43	39	46	-17	-15	-20
-Rotuma	33	32	33	46	44	48	-13	-12	-15

Table IX-A6b: Recent in-, out- and net-migration rates per year (‰) at the provincial level for the Fijian population age five and over by sex based on 2007 Census data

Division/ Province	In-migration rates (‰)			Out-migration rates (‰)			Net-migration rates (‰)		
	P	M	F	P	M	F	P	M	F
Fiji	**35**	**34**	**35**	**35**	**34**	**35**	**0**	**0**	**0**
Provinces in the Western Division									
-Ba	**29**	29	29	30	30	31	-1	-1	-2
-Nadroga	30	30	30	23	21	24	7	8	6
-Ra	25	25	26	31	31	31	6	7	-5
Provinces in the Central Division									
-Naitasiri	44	42	46	28	28	28	16	13	17
-Namosi	27	27	28	33	32	33	-5	-5	-6
-Rewa	38	36	40	43	42	43	-5	-6	-4
-Serua	46	43	49	28	27	29	18	16	-20
-Tailevu	33	35	32	29	28	30	5	7	2
Provinces in the Northern Division									
-Bua	25	25	26	54	51	56	-29	-27	-31
-Cakaudrove.	25	25	24	32	32	34	-8	-7	-10
-Macuata	45	46	45	37	36	37	8	9	8
Provinces in the Eastern Division									
-Kadavu	47	44	49	60	56	65	-13	-12	-15
-Lau	38	37	38	46	43	50	-8	-6	-11
-Lomaiviti	25	23	26	42	38	46	-17	-15	-20
-Rotuma	*	*	*	*	*	*	*	*	*

Note *Numbers too small for meaningful computation

Table IX-A6c: Recent in-, out- and net-migration rates per year (‰) at the provincial level for the Indian population age five and over by sex based on 2007 Census data

Division/ Province	In-migration rates (‰)			Out-migration rates (‰)			Net-migration rates (‰)		
	P	M	F	P	M	F	P	M	F
Fiji	**64**	**57**	**71**	**64**	**57**	**71**	**0**	**0**	**0**
Provinces in the Western Division									
-Ba	13	12	14	10	9	10	3	3	3
-Nadroga	19	18	21	24	21	26	-4	-3	-6
-Ra	17	15	19	36	34	39	-19	-19	-19
Provinces in the Central Division									
-Naitasiri	39	39	40	16	16	17	23	23	23
-Namosi	91	85	97	54	54	54	37	31	43
-Rewa	46	45	48	37	37	37	9	8	10
-Serua	29	27	32	17	15	20	12	12	12
-Tailevu	33	31	35	21	19	23	12	12	11
Provinces in the Northern Division									
-Bua	25	21	29	79	76	82	-54	-55	-53
-Cakaudrove	32	32	32	34	32	35	-2	0	-3
-Macuata	16	16	16	39	40	39	-23	-24	-23
Provinces in the Eastern Division									
-Kadavu	*	*	*	*	*	*	*	*	*
-Lau	*	*	*	*	*	*	*	*	*
-Lomaiviti	52	57	45	97	90	105	-45	-33	-60
-Rotuma	*	*	*	*	*	*	*	*	*

Note *Numbers too small for meaningful computation

Finally, in Table IX-A7, the annual net-migration rates of the total population as well as those for Fijians and Indians are compared.

Table IX-A7: Comparison of the annual net-migration rates (‰) at the provincial level for the total population, Fijians and Indians derived from 1996 and 2007 Census data

Province	Total Population		Fijians		Indians	
	1996	2007	1996	2007	1996	2007
Fiji	0	0	0	0	0	0
Provinces in the Western Division						
-Ba	1	2	5	-1	-1	3
-Nadroga	-4	3	2	7	-10	-4
-Ra	-11	-10	-7	-6	-17	-19
Provinces in the Central Division						
-Naitasiri	29	19	28	15	31	23
-Namosi	-22	-2	-22	-5	*	*
-Rewa	-1	5	3	-5	-5	9
-Serua	4	17	5	18	2	12
-Tailevu	-9	7	-12	5	-2	12
Provinces in the Northern Division						
-Bua	-27	-33	-20	-29	-55	-54
-Cakaudrove	-14	-6	-15	-8	-4	-2
-Macuata	-6	-11	2	8	-9	-23
Provinces in the Eastern Division						
-Kadavu	-33	-28	-31	-13	*	*
-Lau	-39	-11	-38	-8	*	*
-Lomaiviti	-39	-17	-40	-17	*	*
-Rotuma	15	-13	*	*	*	*

Note * Numbers too small for meaningful computation
Source: 1996 rates from Bakker, 2000:69

PART B

URBANIZATION

Inter-sectoral migration includes:

- Migration from rural to urban areas (R→U)
- Migration from urban to urban areas (U→U)
- Migration from urban to rural areas (U→R)
- Migration from rural to rural areas (R→R)

Although Part B of Chapter IX provides some information on each of these types of inter-sectoral migration, (except migration between rural areas), the main emphasis is on the type that is of greatest importance to policy makers and planners, viz. migration from rural to urban areas.[37]Furthermore, as in the case of interprovincial migration in Part A, the analysis will again distinguish between lifetime and recent migration.

The analysis in Part B is based on the urban areas as defined in Chapter I. These are Fiji's statistical/census urban areas.[38] It does not consider migration to and from the incorporated cities and towns. It will be recalled that the boundaries of the cities/towns in Fiji are political/administrative boundaries. They are not based on demographic/statistical criteria. These incorporated cities and towns are therefore not very meaningful units for demographic/statistical analysis. Studies of rural-urban migration, urban growth and urbanization that are based on incorporated cities/towns instead of the statistical/census urban areas can only lead to a misleading picture of urban growth and urbanization.[39]

At the time of the 1996 Census, Fiji had only one recognized urban agglomeration viz. the Greater Suva Area consisting of the Urban Area Suva and the Urban Area Lami. In 2007, another urban agglomeration has been added to this viz. the Lautoka-Nadi corridor.[40]

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[37] Rural to rural migration is to some extent covered in Part A but only at the provincial level.

[38] Census (statistical) Urban Areas in Fiji were for the first time delineated before the 1966 Census. During this census, fourteen of these urban areas were created. Eight of these, viz. the Suva, Lautoka, Nadi, Labasa, Nausori, Ba, Sigatoka, and Levuka urban areas, included an incorporated city/town. The other six urban areas viz. Savusavu, Tavua, Navua, Vatukoula, Rakiraki and Korovou received the status of urban areas for census/statistical purposes only. The boundaries of all urban areas were reviewed before the 1976 and again before the 1996 census. The 1996 boundary changes were based on a more sophisticated set of criteria than in 1966 and 1976. The new urban area criteria as well as the resulting boundary changes have been reported in detail in FIBoS, 1997. At the time of the 1996 Census the towns Savusavu [1969] and Tavua [1992] had also been proclaimed. Moreover Lami, formerly a part of the peri-urban area of Suva, had become an incorporated town in 1977. Moreover, three additional urban areas for census/statistical purposes were created before the 1996 census, viz. Pacific Harbour, Seaqaqa and Nabouwalu. Finally, during the 1996-2007 intercensal period, Nasinu was incorporated and the urban area of Nasinu created.

[39] An important example is that studies of rural-urban migration, urban growth and urbanization based on cities/towns create the impression that relatively few Fijians are urban dwellers or rural-urban migrants. The most important reason for this bias is that, probably for political reasons, Fijian "urban villages" are, as a rule not incorporated in the cities/towns. The only exception so far is Namoli Village, which is part of Lautoka City. However, the exclusion of these "urban villages" from the cities/towns makes little sense from the statistical/demographic point of view.

[40] However, in 2007, the Urban Area Lautoka and Nadi are still separated by a part which is more rural than urban in character.

The Analytical Report of the 1996 Census included only a basic analysis of migration between the geographic sectors of the country. After this census, the scheduled Research Monograph on urbanization was never produced. The further analysis programme of the 2007 Census includes once again a Census Research Monograph on urbanization. Like the Census Monograph on interprovincial migration, the monograph on urbanization will again include an analysis of the main demographic and socio-economic characteristics of inter-sectoral migrants, especially the characteristics of rural to urban migrants.

1. Lifetime inter-sectoral migration

1.1. Categories

Tables IX-B1a-d present a picture of inter-sectoral lifetime migration of the total population, Fijians, Indians and Others, derived from 2007 Census data. It shows the number of lifetime migrants to and from all urban areas (UA). In the left part of these tables, all respondents who, during the 2007 Census, reported one of Fiji's UAs as their usual place of residence (UPOR) are further categorized according to their place of birth (POB). There are three possibilities:

- POB is any rural location in Fiji. Respondents in this category constitute the important group of persons who, during their lifetime, migrated from the rural to the urban sector (R→U).

- POB is any urban location in Fiji. In this case, there are two sub-categories:

  - POB is the same UA as the one the respondents reported as their UPOR at the time of the 2007 Census. The respondents in this sub-category are therefore lifetime non-migrants.
  - POB is another UA as the one the respondents reported as their UPOR at the time of the 2007 Census. Respondents in this sub-category therefore constitute the group of urban to urban (U→U) migrants.

- POB is overseas

In the right part of these tables, all respondents who reported one of Fiji's urban areas as their POB are further categorized according to their UPOR in 2007. There are again three possibilities:

- UPOR in 2007 is any rural location in Fiji. Respondents in this category constitute the lifetime urban to rural (U→R) migrants

- UPOR in 2007 is any urban location in Fiji. There are again two sub-categories

  - UPOR in 2007 is the same UA as the one the respondents reported as their POB. The respondents in this sub-category are therefore non-migrants
  - UPOR in 2007 is another UA as the one the respondents reported as their POB. Respondents in this sub-category are therefore also urban to urban (U→U) migrants.

- POB is overseas

Table IX-B1a: Lifetime migration to and from urban areas, derived from 2007 Census data: Total Population

UPOR 2007(Urban Area)	Total Nr	Place of Birth				POB (Urban Area)	Total Nr	Usual Place of Residence 2007			
		Rural (R→U)	Urban		Over-seas			Rural (U→R)	Urban		Over-Seas
			Same UA	Other UA (U→U)					Same UA	Other UA (U→U)	
All UAs	**418,071**	**168,734**	**172,663**	**67,080**	**9,594**	**All UAs**	**279,402**	**39,538**	**172,663**	**67,080**	**121**
UAs in Western Division						**UAs in Western Division**					
Lautoka	59,189	22,375	28,716	7,454	644	**Lautoka**	43,232	6,575	28,716	7,932	9
Nadi	42,410	19,673	15,835	5,794	1,108	**Nadi**	22,242	2,970	15,835	3,431	6
Ba	19,443	8,916	7,965	2,408	154	**Ba**	12,942	2,169	7,965	2,803	5
Sigatoka	9,332	3,549	4,423	1,230	130	**Sigatoka**	7,098	1,217	4,423	1,449	9
Tavua	2,593	883	1,232	437	41	**Tavua**	3,821	1,012	1,232	1,574	3
Rakiraki	4,805	1,833	2,308	602	62	**Rakiraki**	4,148	576	2,308	1,264	0
Vatukoula	5,482	1,825	3,145	493	19	**Vatukoula**	6,792	1,792	3,145	1,848	7
UAs in Central Division						**UAs in Central Division**					
Suva	81,098	29,586	34,514	11,410	5,588	**Suva**	65,635	9,399	34,514	21,690	32
Lami	19,930	6,467	10,531	2,539	393	**Lami**	15,302	1,537	10,531	3,225	9
Nasinu	89,638	37,484	30,588	20,831	735	**Nasinu**	42,502	4,652	30,588	7,252	10
Nausori	40,710	16,324	15,066	9,098	222	**Nausori**	20,800	1,837	15,066	3,893	4
Navua	4,174	1,263	2,118	763	30	**Navua**	3,403	464	2,118	816	5
Korovou	372	225	76	69	2	**Korovou**	762	205	76	481	0
Deuba	1,773	664	515	469	125	**Deuba**	838	108	515	214	1
UAs in North2,811ern Division						**UAs in Northern Division**					
Labasa	27,460	13,573	11,632	2,046	209	**Labasa**	21,257	3,232	11,632	6,381	12
Savusavu	6,394	2,811	2,550	948	85	**Savusavu**	4,808	1,145	2,550	1,104	9
Nabouwalu	544	169	302	65	8	**Nabouwalu**	785	149	302	334	0
Seaqaqa	765	506	166	93	0	**Seaqaqa**	856	201	166	489	0
UAs in Eastern Division						**UAs in Eastern Division**					
Levuka	1,959	608	22981	331	39	**Levuka**	2,179	298	981	900	0

Table IX-B1b: Lifetime migration to and from urban areas, derived from 2007 Census data: Fijians

UPOR 2007(Urban Area)	Total Nr	Place of Birth				POB (Urban Area)	Total Nr	Usual Place of Residence 2007			
		Rural (R→U)	Urban		Over-seas			Rural (U→R)	Urban		Over-Seas
			Same UA	Other UA (U→U)					Same UA	Other UA (U→U)	
All UAs	**205,134**	**89,213**	**83,245**	**31,977**	**699**	**All UAs**	**139,912**	**24,684**	**83,245**	**31,977**	**6**
UAs in Western Division						**UAs in Western Division**					
Lautoka	26,026	10,662	11,490	3,866	8	**Lautoka**	18,768	3,842	11,490	3,436	0
Nadi	19,730	9,824	7,182	2,710	14	**Nadi**	9,629	1,155	7,182	1,292	0
Ba	5,690	2,363	2,256	1,070	1	**Ba**	3,556	669	2,256	631	0
Sigatoka	4,363	1,656	2,181	525	1	**Sigatoka**	3,222	594	2,181	447	0
Tavua	1,668	477	986	204	1	**Tavua**	2,280	679	986	615	0
Rakiraki	2,098	896	908	284	10	**Rakiraki**	1,402	194	908	300	0
Vatukoula	3,315	1,108	1,921	285	1	**Vatukoula**	4,460	1,377	1,921	1,162	0
UAs in Central Division						**UAs in Central Division**					
Suva	45,101	18,902	20,367	5,478	354	**Suva**	39,882	7,120	20,367	12,391	4
Lami	15,904	5,504	8,628	1,630	142	**Lami**	12,327	1,303	8,628	2,395	1
Nasinu	47,000	21,053	16,175	9,658	114	**Nasinu**	23,779	3,434	16,175	4,170	0
Nausori	16,793	7,636	5,319	3,799	39	**Nausori**	8,029	1,096	5,319	1,614	0
Navua	1,386	681	473	232	0	**Navua**	932	216	473	243	0
Korovou	315	205	55	55	0	**Korovou**	506	170	55	281	0
Deuba	1,252	532	423	297	0	**Deuba**	643	86	423	134	0
UAs in Northern Division						**UAs in Northern Division**					
Labasa	9,542	5,609	2,713	1,217	3	**Labasa**	5,520	1,459	2,713	1,348	0
Savusavu	2,865	1,290	1,205	367	3	**Savusavu**	2,705	887	1,205	612	1
Nabouwalu	496	145	290	53	8	**Nabouwalu**	633	107	290	236	0
Seaqaqa	271	180	38	53	0	**Seaqaqa**	196	64	38	94	0
UAs in Eastern Division						**UAs in Eastern Division**					
Levuka	1,319	490	635	194	0	**Levuka**	1,443	232	635	576	0

Table IX-B1c: Lifetime migration to and from urban areas, derived from 2007 Census data: Indians

UPOR 2007(Urban Area)	Total Nr	Place of Birth			
		Rural (R→U)	Urban		Over-seas
			Same UA	Other UA (U→U)	
All UAs	**179,341**	**71,501**	**76,747**	**29,093**	**2,000**
UAs in Western Division					
Lautoka	29,853	10,942	15,774	2,878	259
Nadi	19,572	8,948	8,047	2,340	237
Ba	13,188	6,389	5,494	1,209	96
Sigatoka	4,521	1,794	2,096	584	47
Tavua	809	379	225	179	26
Rakiraki	2,639	918	1,385	295	41
Vatukoula	1,833	635	1,056	140	2
UAs in Central Division					
Suva	23,473	8,366	9,399	4,794	914
Lami	1,396	511	446	401	38
Nasinu	36,617	14,661	12,171	9,642	143
Nausori	22,230	8,076	9,267	4,817	70
Navua	2,559	534	1,527	481	17
Korovou	33	10	9	12	2
Deuba	146	48	39	58	1
UAs in Northern Division					
Labasa	16,950	7,592	8,576	696	86
Savusavu	2,753	1,311	993	439	10
Nabouwalu	44	22	12	10	0
Seaqaqa	476	312	127	37	0
UAs in Eastern Division					
Levuka	249	53	104	81	11

POB (Urban Area)	Total Nr	Usual Place of Residence 2007			
		Rural (U→R)	Urban		Over-Seas
			Same UA	Other UA (U→U)	
All UAs	**118,479**	**12,606**	**76,747**	**29,093**	**33**
UAs in Western Division					
Lautoka	21,963	2,473	15,774	3,716	0
Nadi	11,760	1,751	8,047	1,962	0
Ba	8,979	1,467	5,494	2,018	0
Sigatoka	3,630	599	2,096	926	9
Tavua	1,381	313	225	843	0
Rakiraki	2,685	371	1,385	929	0
Vatukoula	1,673	315	1,056	302	0
UAs in Central Division					
Suva	17,578	1,334	9,399	6,843	2
Lami	1,010	126	446	438	0
Nasinu	15,708	966	12,171	2,571	0
Nausori	12,060	688	9,267	2,105	0
Navua	2,281	222	1,527	527	5
Korovou	226	33	9	184	0
Deuba	123	19	39	64	1
UAs in Northern Division					
Labasa	14,868	1,584	8,576	4,697	11
Savusavu	1,482	142	993	342	5
Nabouwalu	137	34	12	91	0
Seaqaqa	648	134	127	387	0
UAs in Eastern Division					
Levuka	287	12,606	104	148	0

Table IX-B1d: Lifetime migration to and from urban areas, derived from 2007 Census data: Others

UPOR 2007(Urban Area)	Total Nr	Place of Birth				POB (Urban Area)	Total Nr	Usual Place of Residence 2007			
		Rural (R→U)	Urban		Over-seas			Rural (U→R)	Urban		Over-Seas
			Same UA	Other UA (U→U)					Same UA	Other UA (U→U)	
All UAs	**33,596**	**8,020**	**12,671**	**6,010**	**6,895**	**All UAs**	**21,011**	**2,248**	**12,671**	**6,010**	**82**
UAs in Western Division						**UAs in Western Division**					
Lautoka	3,310	771	1,452	710	377	**Lautoka**	2,501	260	1,452	780	9
Nadi	3,108	901	606	744	857	**Nadi**	853	64	606	177	6
Ba	565	164	215	129	57	**Ba**	407	33	215	154	5
Sigatoka	448	99	146	121	82	**Sigatoka**	246	24	146	76	0
Tavua	116	27	21	54	14	**Tavua**	160	20	21	116	3
Rakiraki	68	19	15	23	11	**Rakiraki**	61	11	15	35	0
Vatukoula	334	82	168	68	16	**Vatukoula**	659	100	168	384	7
UAs in Central Division						**UAs in Central Division**					
Suva	12,524	2,318	4,748	1,138	4,320	**Suva**	8,175	945	4,748	2,456	26
Lami	2,630	452	1,457	508	213	**Lami**	1,965	108	1,457	392	8
Nasinu	6,021	1,770	2,242	1,531	478	**Nasinu**	3,015	252	2,242	511	10
Nausori	1,687	612	480	482	113	**Nausori**	711	53	480	174	4
Navua	229	48	118	50	13	**Navua**	190	26	118	46	0
Korovou	24	10	12	2	0	**Korovou**	30	2	12	16	0
Deuba	375	84	53	114	124	**Deuba**	72	3	53	16	0
UAs in Northern Division						**UAs in Northern Division**					
Labasa	968	372	343	133	120	**Labasa**	869	189	343	336	1
Savusavu	776	210	352	142	72	**Savusavu**	621	116	352	150	3
Nabouwalu	4	2	0	2	0	**Nabouwalu**	15	8	0	7	0
Seaqaqa	18	14	1	3	0	**Seaqaqa**	12	3	1	8	0
UAs in Eastern Division						**UAs in Eastern Division**					
Levuka	391	65	242	56	28	**Levuka**	449	31	242	176	0

1.2. Discussion of results

The following comments refer to the information in Table IX-B1a-d.

- Of the 418,071 persons with an urban usual place of residence in 2007, 168,734 (57.3 %) are rural born and 239,743 (40.4 %) are urban born. The remainder, 9,594 (2.3 %) were born overseas. The following overview presents the proportional (%) distribution by ethnicity:

Ethnicity	Total Pop UPOR in 2007 is urban	Born Rural (R→U)		Born Urban		Born Overseas	
		(Nr)	(%)	(Nr)	(%)	(Nr)	(%)
Total Population	**418,071**	**168,734**	**40.4**	**239,743**	**57.3**	**9,594**	**2.3**
Fijians	205,134	89,213	43.5	115,222	56.2	699	0.3
Indians	179,341	71,501	39.9	105,840	59.0	2,000	1.1
Others	33,596	8,020	23.9	18,681	55.6	6,895	20.5

The proportion of urban born persons is significantly higher than the number of rural born persons. In 2007, there are only two urban areas left with a higher number of rural born persons than urban born persons. These are the two very small urban areas (unincorporated townships) Korovou and Seaqaqa.[41] However, in three urban areas with a significant Indian population, Labasa, Nadi and Ba are where the number of rural and urban born persons still relatively close.

- The urban areas with the highest proportion of urban born persons (more than 65 % is urban born) tend to be relatively small, viz. Navua (69.0 %), Nabouwalu (67.5 %) Levuka (67.0 %), and Vatukoula (66.4 %). Three of the urban areas are in fact unincorporated townships (urban areas for census/statistical purposes only]. Only Lami (65.6 % urban born) is a somewhat larger urban area.

- Of the 239,743 urban born persons, most are born in the same urban area that was their usual place of residence in 2007. In other words they are not urban to urban migrants but non-migrants. Only a relatively small proportion is urban to urban migrant. Moreover, the proportions for Fijians and Indians are surprisingly close. The following overview presents the proportional distribution of the category of urban born persons by ethnicity:

Ethnicity	Born Urban	Born in 2007 UPOR		Born in Other UA (U→U)	
		(Nr)	(%)	(Nr)	(%)
Total Population	**239,743**	**172,663**	**72.0**	**67,080**	**28.0**
Fijians	115,222	83,245	72.2	31,977	27.8
Indians	105,840	76,747	72.5	29,093	27.5
Others	18,681	12,671	67.8	6,010	32.2

- The 168,734 rural born persons constitute the important category of lifetime rural to urban migrants. With the exception of the two very small urban areas Korovou and Seaqaqa, five

[41] In 1996, the urban areas Labasa and Sigatoka also fell in this category.

urban areas have a rural born population that is higher than 40 %. These are Nadi (46.4 %), Ba (45.9 %), Savusavu (44.0 %), Nasinu (41.8 %) and Nausori (40.1 %)

- In terms of numbers, lifetime rural-urban migration is dominated by the two agglomerations, consisting of the Lami-Suva-Nasinu-Nausori corridor and the Nadi-Lautoka corridor.[42] This is shown in the following overview:

Urban Area	Lifetime Rural to Urban Migrants	
	Nr	%
Suva	29,586	17.5
Nasinu	37,484	22.2
Lami	6,467	3.8
Greater Suva	73,537	43.6
Nausori	16,324	9.7
Lami-Nausori Corridor*	**89,861**	**53.3**
Nadi	22,375	13.3
Lautoka	19,673	11.7
Nadi-Lautoka Corridor#	**42,048**	**24.9**
Both agglomerations	**131,909**	**78.2**

Note * The comparable proportion for 1996 is 52.2 %
The comparable proportion for 1996 is 20.6 %

Rural to urban migration to the urban areas in the Northern and Eastern Division with the exception of Labasa (13,573 persons or 8.0 %) is limited.

- Considering what has been said in Part A of this chapter on inter-provincial lifetime and recent migration of Fijians and Indians, it does not come as a surprise that lifetime rural-urban migration is also dominated by Fijians. In 2007, 52.9 percent of all lifetime rural-urban migrants are Fijians as compared to 42.4 percent for Indians and 4.8 percent for Others. However, this generalized picture of rural-urban migration requires more detail.

  - There are more Indian than Fijian rural to urban migrants to several urban areas in the Western Division viz. Lautoka, Ba, Sigatoka and Rakiraki. In the Northern Division that also applies to Labasa, Savusavu and Seaqaqa.

[42] The agglomeration Greater Suva is defined as the Urban Areas Suva, Nasinu and Lami. Lami was a part of the Suva Urban Area until 1 March 1977. At that date Lami received the status of an incorporated town. Furthermore, Nasinu Town was proclaimed after the 1996 Census. Before, the entire area of Nasinu Town was part of the peri-urban of Suva. On the other hand, Nausori has been an incorporated town in its own right since 1931 and has never been a part of the peri-urban area of Suva. For this reason it has not been included in the agglomeration Greater Suva.

- However, rural to urban migration to the urban areas of the Central Division, except Nausori, is dominated by Fijians. In 2007, there were 45,459 Fijian rural-urban migrants in the Greater Suva area. The comparable figure for Indians is 23,538. The majority of the Indian rural to urban migrants migrated to the Nasinu Urban Area.

➢ Not surprisingly, of the 9,594 persons born overseas, 6,895 are "Others". Moreover, of these 9,594 persons, the majority (5,588 or 58.2 %) had, in 2007, the urban area of Suva as their usual place of residence, Other urban areas with a significant number of "Others" who were born overseas are Nadi (1,108 or 11.5 %) and Nasinu (735 or 7.7 %).

➢ Table IX-B2 compares the different types of inter-sectoral lifetime migration at the national level by ethnicity in 1996 and 2007.

Table IX-B2: Comparison of inter-sectoral lifetime migration by ethnicity in 1996 and 2007.

Ethnicity	Year	R→U migrants	U→U migrants	U→R migrants
Total Population	**1996**	**86,288**	**64,116**	**29,947**
	2007	**168,734**	**67,080**	**39,538**
Fijians	**1996**	54,534	28,863	20,842
	2007	89,213	31,977	24,684
Indians	**1996**	26,821	29,794	7,501
	2007	71,501	29,093	12,606
Others	**1996**	4,933	5,459	1,604
	2007	8,020	6,010	2,248

1.3. Typology of lifetime rural to urban migration by "distance travelled"

In this section, the 168,734 persons categorized as lifetime rural-urban migrants during the 2007 Census are further subdivided into three categories, A, B and C. This typology is loosely related to the distance travelled by these migrants.

Category A: 'Short distance' migrants

This category refers to lifetime rural to urban migration by persons born in the rural sector of the same province (or provinces) as the one(s) in which the urban area under consideration is located.[43] In other words, in order to get to this urban area, these persons migrated over a relatively short distance and they did not cross a provincial boundary in doing so.

[43] All 2007 urban areas, except Suva and Nausori are located in one province only. The Suva Urban Area is located in two provinces viz. Rewa and Naitasiri. The Nausori Urban Area is located in three provinces viz. Tailevu, Naitasiri and Rewa [only two peri-urban EAs].

- Category B: "Intermediate distance" migrants

  This category refers to lifetime rural to urban migration by persons born in the rural sector of another province(s) as the one(s) in which the urban area under consideration is located. However, these provinces are part of the same division as the one(s) in which the urban area is (are) located. In order to get to this urban area, these persons crossed at least one provincial boundary but not a divisional boundary. For most, but certainly not all of these migrants the distance covered is "intermediate".

- Category C: "Long distance" migrants

  This category also refers to lifetime rural to urban migration by persons born in the rural sector of another province(s) as the one(s) in which the urban area under consideration is located. However, in this case, these provinces are part of another division. In order to get to this urban area, these persons crossed a divisional boundary. These migrants are referred to as "long distance" migrants.

  Note: Migration to an urban area in the Western Division by persons coming from the Central Division or migration to an urban area in the Central Division by persons coming from the Western Division is not necessarily 'long distance' migration. However, as has been shown, a large proportion of migrants move to the major urban agglomerations of these two divisions. In the case of the Central Division, this is the agglomeration Greater Suva and the Nausori Urban Area and in the case of the Western Division it is the Lautoka-Nadi corridor. Consequently, most of these migrants are indeed long-distance migrants. Furthermore, migrants coming from one of the provinces in the Northern and Eastern Division to the urban areas in the Central and Western Division can all be considered as long-distance migrants.

Table IX-B3a to d presents the number and proportion of each "distance" category (A, B and C) of lifetime rural-urban migrants to each of the 2007 Urban Areas. Unfortunately, the 2007 figures are not entirely comparable with those for 1996 and the 1996 data has therefore not been included.

The information has been summarized in Table IX-4.

- The most dominant lifetime migrant category is Category C (50.1 %). However, this does not apply to Indian lifetime migrants. They are predominantly Category C migrants but this is almost entirely due to Indian "long distance" migration to the Suva-Nausori corridor.

- By far the least dominant lifetime migrant category is Category B (16.2%). This applies to all ethnic groups, but particularly the "Others". There are, however a few exceptions, mainly Lami and Nasinu which receive less Category A than Category B migrants. The reason for this is obvious. The rural population of Rewa (in the case of Lami) and Naitasiri (in the case of Nasinu) is relatively small.

Table IX-B3a: Lifetime rural-urban migration to each of the 2007 Urban Areas derived from 2007 Census data: Total Population

Urban Area (2007)	Lifetime R→U Migrants (Total Nr)	Category A Lifetime R→U Migrants		Category B Lifetime R→U Migrants		Category C Lifetime R→U Migrants	
		Nr	%	Nr	%	Nr	%
All UAs	**168,734**	**56,925**	**33.7**	**27,399**	**16.2**	**84,470**	**50.1**
Urban Areas in the Western Division							
Lautoka	22,375	10,433	46.6	4,217	18.8	7,725	34.5
Nadi	19,673	9,552	48.6	3,412	17.3	6,709	34.1
Ba	8,916	6,504	72.9	1,089	12.2	1,323	14.8
Sigatoka	3,549	1,784	50.3	721	20.3	1,044	29.4
Tavua	883	476	53.9	117	13.3	290	32.8
Rakiraki	1,833	834	45.5	509	27.8	490	26.7
Vatukoula	1,825	788	43.2	314	17.2	723	39.6
Urban Areas in the Central Division							
Suva	29,586	4,695	15.9	3,706	12.5	21,185	71.6
Lami	6,467	821	12.7	1,102	17.0	4,544	70.3
Nasinu	37,484	4,101	10.9	6,459	17.2	26,924	71.8
Nausori	16,324	6,323	38.7	328	2.0	9,673	59.3
Navua	1,263	182	14.4	465	36.8	616	48.8
Korovou	225	83	36.9	22	9.8	120	53.3
Deuba	664	96	14.5	163	24.5	405	61.0
Urban Areas in the Northern Division							
Labasa	13,573	8,250	60.8	3,437	25.3	1,886	13.9
Savusavu	2,811	1,319	46.9	1,027	36.5	465	16.5
Nabouwalu	169	52	30.8	50	29.6	67	39.6
Seaqaqa	506	323	63.8	124	24.5	59	11.7
Urban Areas in the Eastern Division							
Levuka	608	309	50.8	77	12.7	222	36.5

Table IX-B3b: Lifetime rural-urban migration to each of the 2007 Urban Areas derived from 2007 Census data: Fijians

Urban Area (2007)	Lifetime R→U Migrants (Total)	Category A Lifetime R→U Migrants		Category B Lifetime R→U Migrants		Category C Lifetime R→U Migrants	
		Nr	%	Nr	%	Nr	%
All UAs	**89,213**	**22,852**	**25.6**	**15,224**	**17.1**	**51,137**	**57.3**
Urban Areas in the Western Division							
Lautoka	10,662	3,088	29.0	1,867	17.5	5,707	53.5
Nadi	9,824	3770	38.4	1,136	11.6	4,918	50.1
Ba	2,363	937	39.7	527	22.3	899	38.0
Sigatoka	1,656	680	41.1	217	13.1	759	45.8
Tavua	477	203	42.6	69	14.5	205	43.0
Rakiraki	896	467	52.1	90	10.0	339	37.8
Vatukoula	1,108	321	29.0	193	17.4	594	53.6
Urban Areas in the Central Division							
Suva	18,902	3,466	18.3	2,714	14.4	12,722	67.3
Lami	5504	603	11.0	975	17.7	3,926	71.3
Nasinu	21,053	2,605	12.4	4,147	19.7	14,301	67.9
Nausori	7,636	3,212	42.1	158	2.1	4,266	55.9
Navua	681	112	16.4	315	46.3	254	37.3
Korovou	205	80	39.0	19	9.3	106	51.7
Deuba	532	84	15.8	132	24.8	316	59.4
Urban Areas in the Northern Division							
Labasa	5,609	2104	37.5	2,275	40.6	1,230	21.9
Savusavu	1,290	736	57.1	238	18.4	316	24.5
Nabouwalu	145	47	32.4	34	23.5	64	44.1
Seaqaqa	180	85	47.2	57	31.7	38	21.1
Urban Areas in the Eastern Division							
Levuka	490	252	51.4	61	12.4	177	36.1

Table IX-B3c: Lifetime rural-urban migration to each of the 2007 Urban Areas derived from 2007 Census data: Indians

Urban Area (2007)	Lifetime R→U Migrants (Total)	Category A Lifetime R→U Migrants		Category B Lifetime R→U Migrants		Category C Lifetime R→U Migrants	
		Nr	%	Nr	%	Nr	%
All UAs	**71,501**	**32,494**	**45.4**	**11,422**	**16.0**	**27,585**	**38.6**
Urban Areas in the Western Division							
Lautoka	10,942	7,174	65.6	2,297	21.0	1,471	13.4
Nadi	8,948	5,481	61.3	2,225	24.9	1,242	13.9
Ba	6,389	5,482	85.8	551	8.6	356	5.6
Sigatoka	1,794	1,077	60.0	481	26.8	236	13.2
Tavua	379	265	69.9	47	12.4	67	17.7
Rakiraki	918	362	39.4	417	45.4	139	15.1
Vatukoula	635	446	70.2	121	19.1	68	10.7
Urban Areas in the Central Division							
Suva	8,366	855	10.2	865	10.3	6,646	79.4
Lami	511	172	33.7	99	19.4	240	47.0
Nasinu	14,661	1,378	9.4	2,178	14.9	11,105	75.7
Nausori	8,076	2,981	36.9	159	2.0	4,936	61.1
Navua	534	65	12.2	137	25.7	332	62.2
Korovou	10	2	20.0	1	10.0	7	70.0
Deuba	48	9	18.8	16	33.3	23	47.9
Urban Areas in the Northern Division							
Labasa	7,592	6,006	79.1	999	13.2	587	7.7
Savusavu	1,311	474	36.2	753	57.4	84	6.4
Nabouwalu	22	5	22.7	16	72.7	1	4.5
Seaqaqa	312	232	74.4	60	19.2	20	6.4
Urban Areas in the Eastern Division							
Levuka	53	28	52.8	0	0.0	25	47.2

Table IX-B3d: Lifetime rural-urban migration to each of the 2007 Urban Areas derived from 2007 Census data: Others

Urban Area (2007)	Lifetime R→U Migrants (Total Nr)	Category A Lifetime R→U Migrants		Category B Lifetime R→U Migrants		Category C Lifetime R→U Migrants	
		Nr	%	Nr	%	Nr	%
All UAs	**8,020**	**1,579**	**19.7**	**693**	**8.6**	**5,748**	**71.7**
Urban Areas in the Western Division							
Lautoka	**771**	171	22.2	53	6.9	547	70.9
Nadi	**901**	301	33.4	51	5.7	549	60.9
Ba	**164**	85	51.8	11	6.7	68	41.5
Sigatoka	**99**	27	27.3	23	23.2	49	49.5
Tavua	**27**	8	29.6	1	3.7	18	66.7
Rakiraki	**19**	5	26.3	2	10.5	12	63.2
Vatukoula	**82**	21	25.6	0	0.0	61	74.4
Urban Areas in the Central Division							
Suva	**2,318**	374	16.1	127	5.5	1,817	78.4
Lami	**452**	46	10.2	28	6.2	378	83.6
Nasinu	**1,770**	118	6.7	134	7.6	1,518	85.8
Nausori	**612**	130	21.2	11	1.8	471	77.0
Navua	**48**	5	10.4	13	27.1	30	62.5
Korovou	**10**	1	10.0	2	20.0	7	70.0
Deuba	**84**	3	3.4	15	17.9	66	78.6
Urban Areas in the Northern Division							
Labasa	**372**	140	37.6	163	43.8	69	18.5
Savusavu	**210**	109	51.9	36	17.1	65	31.0
Nabouwalu	**2**	0	0.0	0	0.0	2	100.0
Seaqaqa	**14**	6	42.9	7	50.0	1	7.1
Urban Areas in the Eastern Division							
Levuka	**65**	29	44.6	16	24.6	20	30.8

Table IX-4: Subdivision of lifetime rural to urban migrants by ethnicity to each of the urban areas into three categories, A, B and C, derived from 2007 Census data

Urban Area	Total Migrants			Fijian Migrants			Indian Migrants			Other Migrants		
	A	B	C	A	B	C	A	B	C	A	B	C
Urban Areas in the Western Division												
Lautoka	v					v	v					v
Nadi	v					v	v					v
Ba	v			v			v			v		
Sigatoka	v					v	v					v
Tavua	v					v	v					v
Rakiraki	v			v				v				v
Vatukoula	v					v	v					v
Urban Areas in the Central Division												
Suva			v			v			v			v
Lami			v			v			v			v
Nasinu			v			v			v			v
Nausori			v			v			v			v
Navua			v		v				v			v
Korovou			v						v			v
Deuba			v			v			v			v
Urban Areas in the Northern Division												
Labasa	v				v		v				v	
Savusavu	v			v				v		v		
Nabouwalu			v			v		v				v
Seaqaqa	v			v			v				v	
Urban Areas in the Eastern Division												
Levuka	v			v			v			v		

- Fijian lifetime rural to urban migrants are predominantly Category C migrants (57.3 %). A very large proportion of these are "long-distance" migrants from the provinces in the Northern and Eastern Division to the Lami-Nausori corridor.

- Indian lifetime rural to urban migrants are predominantly Category A migrants (45.4 %) but this applies (with the exception of Rakiraki) only to rural to urban migrants to the urban areas in the Western Division. The origin of 85.8 percent of all lifetime Indian rural to urban migrants to the urban area of Ba, is the rural sector of Ba Province. This urban area has the highest proportion of "short-distance" migrants of all urban areas in the country. On the other hand, lifetime Indian rural to urban migrants to urban areas in the Central Division are without exception predominantly Category C migrants.

- Other lifetime rural to urban migrants are, with few exceptions) Category C migrants (71.7 %).
- Although it is relatively easy to categorize lifetime rural-urban migration to the urban areas of the Western and Central Division, this is not the case for urban areas in the Northern Division. The only major urban area in this division is Labasa, where Indian rural to urban migrants mainly belong to category A (coming from rural Macuata) and Fijian rural to urban migrants mainly belong to Category B (predominantly from rural Cakaudrove).

2. Recent inter-sectoral migration

2.1. Categories

Table IX-B5a-d presents a picture of inter-sectoral migration of the total population, Fijians and Indians during the five years prior to the 2007 Census (between X and E). It shows the number of recent migrants to and from all urban areas (UA).

In the left-hand section of these tables, all respondents who, during the 2007 Census, reported one of Fiji's UAs as their usual place of residence (UPOR) are again subdivided into three categories but now according to their UPOR in 2002.

- UPOR in 2002 is any rural location in Fiji. Respondents in this category, constitute for policy makers and planners, the very important group of persons who recently, that is in the five years before the 2007 Census, migrated from the rural to the urban sector (R→U).

- UPOR in 2002 is any urban location in Fiji. The two sub-categories are:

  - UPOR in 2002 is the same UA as the one the respondents reported as their UPOR at the time of the 2007 Census. The respondents in this sub-category are therefore recent non-migrants.
  - UPOR in 2002 is another UA as the one the respondents reported as their UPOR at the time of the 2007 Census. Respondents in this sub-category therefore constitute the group of recent urban to urban (U→U) migrants.

- POB is overseas

The right-hand section of these tables categorizes all respondents who reported one of Fiji's urban areas as their UPOR in 2002 according to their UPOR in 2007. There are again three possibilities:

- UPOR in 2007 is any rural location in Fiji. Respondents in this category constitute the recent urban to rural (U→R) migrants

- UPOR in 2007 is any urban location in Fiji. There are again two sub-categories

  - UPOR in 2007 and in 2002 is the same. The respondents in this sub-category are therefore recent non-migrants
  - UPOR in 2007 and in 2002 are different urban areas. Respondents in this sub-category are therefore also recent urban to urban (U→U) migrants.

- POB is overseas

Table IX-B5a: Recent migration to and from urban areas, derived from 2007 Census data: Total Population

UPOR 2007(Urban Area)	Total Nr	Usual Place of Residence 2002				UPOR 2002 (Urban Area)	Total Nr	Usual Place of Residence 2007			
		Rural (R→U)	Urban		Over-seas			Rural (U→R)	Urban		Over-Seas
			Same UA	Other UA (U→U)					Same UA	Other UA (U→U)	
All UAs	**379,514**	**57,479**	**278,173**	**35,785**	**8,077**	**All UAs**	**340,216**	**26,027**	**278,173**	**35,785**	**231**
UAs in Western Division						**UAs in Western Division**					
Lautoka	53,903	6,372	43,040	3,704	787	**Lautoka**	55,231	7,405	43,040	4,747	39
Nadi	38,470	8,787	25,835	2,749	1,099	**Nadi**	29,498	1,644	25,835	1,993	26
Ba	17,830	4,264	12,161	1,157	248	**Ba**	14,123	876	12,161	1,080	6
Sigatoka	8,501	1,387	6,365	611	138	**Sigatoka**	7,429	567	6,365	484	13
Tavua	2,317	436	1,490	344	47	**Tavua**	2,300	282	1,490	524	4
Rakiraki	4,389	639	3,315	399	36	**Rakiraki**	3,985	233	3,315	435	2
Vatukoula	4,835	397	4,030	231	177	**Vatukoula**	5,220	657	4,030	526	7
UAs in Central Division						**UAs in Central Division**					
Suva	74,005	8,740	54,107	7,307	3,851	**Suva**	69,511	4,952	54,107	10,384	68
Lami	17,676	2,054	13,966	1,472	184	**Lami**	16,552	876	13,966	1,705	5
Nasinu	80,954	11,193	59,241	9,666	854	**Nasinu**	70,382	4,291	59,241	6,832	18
Nausori	37,154	5605	26,461	4,785	303	**Nausori**	30,333	1,549	26,461	2,318	5
Navua	3806	485	2,814	475	32	**Navua**	3,337	225	2,814	294	4
Korovou	325	81	159	83	2	**Korovou**	344	63	159	122	0
Deuba	1,587	250	978	283	76	**Deuba**	1,291	113	978	197	3
UAs in Northern Division						**UAs in Northern Division**					
Labasa	25,122	5,245	18,024	1,706	147	**Labasa**	22,361	1,402	18,024	2,916	19
Savusavu	5,721	1,014	4,112	516	79	**Savusavu**	5,205	628	4,112	453	12
Nabouwalu	476	102	311	63	0	**Nabouwalu**	481	28	311	142	0
Seaqaqa	692	208	398	84	2	**Seaqaqa**	820	91	398	331	0
UAs in Eastern Division						**UAs in Eastern Division**					
Levuka	1,751	220	1,366	150	15	**Levuka**	1,813	145	1,366	302	0

Table IX-B5b: Recent migration to and from urban areas, derived from 2007 Census data: Fijians

UPOR 2007(Urban Area)	Total Nr	Usual Place of Residence 2002				UPOR 2002 (Urban Area)	Total Nr	Usual Place of Residence 2007			
		Rural (R→U)	Urban		Over-seas			Rural (U→R)	Urban		Over-Seas
			Same UA	Other UA (U→U)					Same UA	Other UA (U→U)	
All UAs	**182,622**	**32,669**	**128,832**	**19,385**	**1,736**	**All UAs**	**167,085**	**18,861**	**128,832**	**19,385**	**7**
UAs in Western Division						**UAs in Western Division**					
Lautoka	23,053	3,572	17,098	2,184	199	**Lautoka**	25,941	6,225	17,098	2,616	2
Nadi	17,575	5,091	10,911	1,394	179	**Nadi**	12,953	1,008	10,911	1,034	0
Ba	5,006	1,182	3,178	609	37	**Ba**	3,988	394	3,178	416	0
Sigatoka	3,881	763	2,744	325	49	**Sigatoka**	3,273	353	2,744	176	0
Tavua	1,467	286	975	193	13	**Tavua**	1,356	175	975	206	0
Rakiraki	1,873	423	1,208	235	7	**Rakiraki**	1,528	119	1,208	201	0
Vatukoula	2,868	214	2,421	127	106	**Vatukoula**	3,292	560	2,421	311	0
UAs in Central Division						**UAs in Central Division**					
Suva	40,515	5,756	30,282	3,956	521	**Suva**	39,947	3,584	30,282	6,078	3
Lami	14,075	1,668	11,214	1,098	95	**Lami**	13,247	750	11,214	1,283	0
Nasinu	41,831	6,641	29,880	4,992	318	**Nasinu**	36,893	3,033	29,880	3,980	0
Nausori	15,040	2,847	9,615	2,449	129	**Nausori**	11,693	996	9,615	1,081	1
Navua	1,230	311	715	196	8	**Navua**	963	100	715	148	0
Korovou	273	74	127	70	2	**Korovou**	276	60	127	89	0
Deuba	1,112	200	700	199	13	**Deuba**	888	71	700	117	0
UAs in Northern Division						**UAs in Northern Division**					
Labasa	8,463	2,650	4,872	899	42	**Labasa**	6,581	733	4,872	976	0
Savusavu	2,508	612	1,629	254	13	**Savusavu**	2,417	518	1,629	269	1
Nabouwalu	432	87	290	55	0	**Nabouwalu**	408	21	290	97	0
Seaqaqa	245	101	101	41	2	**Seaqaqa**	229	35	101	93	0
UAs in Eastern Division						**UAs in Eastern Division**					
Levuka	1,175	191	872	109	3	**Levuka**	1,212	126	872	214	0

Table IX-B5c: Recent migration to and from urban areas, derived from 2007 Census data: Indians

UPOR 2007(Urban Area)	Total Nr	Usual Place of Residence 2002				UPOR 2002 (Urban Area)	Total Nr	Usual Place of Residence 2007			
		Rural (R→U)	Urban		Over-seas			Rural (U→R)	Urban		Over-Seas
			Same UA	Other UA (U→U)					Same UA	Other UA (U→U)	
All UAs	**166,567**	**21,938**	**128,941**	**13,264**	**2,424**	**All UAs**	**148,120**	**5,866**	**128,941**	**13,264**	**49**
UAs in Western Division						**UAs in Western Division**					
Lautoka	27,843	2,556	23,661	1,194	432	**Lautoka**	26,335	979	23,661	1,695	0
Nadi	18,070	3,273	13,389	991	417	**Nadi**	14,730	579	13,389	761	1
Ba	12,313	3,001	8,648	484	180	**Ba**	9,720	461	8,648	611	0
Sigatoka	4,209	568	3,365	227	49	**Sigatoka**	3,848	192	3,365	278	13
Tavua	741	137	456	122	26	**Tavua**	851	104	456	289	2
Rakiraki	2,457	208	2,077	149	23	**Rakiraki**	2,391	105	2,077	207	2
Vatukoula	1,667	170	1,361	78	58	**Vatukoula**	1,533	67	1,361	105	0
UAs in Central Division						**UAs in Central Division**					
Suva	22,047	2,269	16,588	2,534	656	**Suva**	20,751	902	16,588	3258	3
Lami	1,285	235	866	167	17	**Lami**	1,121	68	866	187	0
Nasinu	33,776	3,981	25,475	4,000	320	**Nasinu**	28,854	1,008	25,475	2371	0
Nausori	20,593	2,493	15,884	2,082	134	**Nausori**	17,494	499	15,884	1111	0
Navua	2,371	154	1,962	238	17	**Navua**	2,197	114	1,962	118	3
Korovou	31	2	18	11	0	**Korovou**	52	2	18	32	0
Deuba	131	8	90	27	6	**Deuba**	147	24	90	32	1
UAs in Northern Division						**UAs in Northern Division**					
Labasa	15,799	2,433	12,589	714	63	**Labasa**	14,960	613	12,589	1740	18
Savusavu	2,529	339	1,996	172	22	**Savusavu**	2,227	74	1,996	151	6
Nabouwalu	40	15	20	5	0	**Nabouwalu**	68	6	20	42	0
Seaqaqa	431	95	294	42	0	**Seaqaqa**	575	56	294	225	0
UAs in Eastern Division						**UAs in Eastern Division**					
Levuka	234	1	202	27	4	**Levuka**	266	13	202	51	0

Table IX-B5d: Recent migration to and from urban areas, derived from 2007 Census data: Others

UPOR 2007(Urban Area)	Total Nr	Usual Place of Residence 2002				UPOR 2002 (Urban Area)	Total Nr	Usual Place of Residence 2007			
		Rural (R→U)	Urban		Overseas			Rural (U→R)	Urban		Over-Seas
			Same UA	Other UA (U→U)					Same UA	Other UA (U→U)	
All UAs	**30,325**	**2,872**	**20,400**	**3,136**	**3,917**	**All UAs**	**25,011**	**1,300**	**20,400**	**3,136**	**175**
UAs in Western Division						**UAs in Western Division**					
Lautoka	3,007	244	2,281	326	156	**Lautoka**	2,955	201	2,281	436	37
Nadi	2,825	423	1,535	364	503	**Nadi**	1,815	57	1,535	198	25
Ba	511	81	335	64	31	**Ba**	415	21	335	53	6
Sigatoka	411	56	256	59	40	**Sigatoka**	308	22	256	30	0
Tavua	109	13	59	29	8	**Tavua**	93	3	59	29	2
Rakiraki	59	8	30	15	6	**Rakiraki**	66	9	30	27	0
Vatukoula	300	13	248	26	13	**Vatukoula**	395	30	248	110	7
UAs in Central Division						**UAs in Central Division**					
Suva	11,443	715	7,237	817	2,674	**Suva**	8,813	466	7,237	1,048	62
Lami	2,316	151	1,886	207	72	**Lami**	2,184	58	1,886	235	5
Nasinu	5,347	571	3,886	674	216	**Nasinu**	4,635	250	3,886	481	18
Nausori	1,521	265	962	254	40	**Nausori**	1,146	54	962	126	4
Navua	205	20	137	41	7	**Navua**	177	11	137	28	1
Korovou	21	5	14	2	0	**Korovou**	16	1	14	1	0
Deuba	344	42	188	57	57	**Deuba**	256	18	188	48	2
UAs in Northern Division						**UAs in Northern Division**					
Labasa	860	162	563	93	42	**Labasa**	820	56	563	200	1
Savusavu	684	63	487	90	44	**Savusavu**	561	36	487	33	5
Nabouwalu	4	0	1	3	0	**Nabouwalu**	5	1	1	3	0
Seaqaqa	16	12	3	1	0	**Seaqaqa**	16	0	3	13	0
UAs in Eastern Division						**UAs in Eastern Division**					
Levuka	342	28	292	14	8	**Levuka**	335	6	292	37	0

2.2. Discussion of results

The format of Tables IX-B3a-d concerning recent migration is identical to that of Tables IX-B1a-d on lifetime migration. However, place of birth (POB) has now been replaced by the usual place of residence (UPOR) in 2002. The tables concerning recent migration therefore refer to the population age five and over.

The following comments refer to the information in Table IX-B5a-d.

- Of the 379,514 persons age five and over with an urban usual place of residence in 2007, 57,479 (15.1 %) had a rural UPOR in 2002 whereas 313,958 (82.7 %) had an urban UPOR in 2002. For the remaining 8,077 (2.1%) persons, their UPOR in 2002 was overseas. The following overview presents the proportional (%) distribution by ethnicity:

Ethnicity	Total Pop 5+ UPOR in 2007 is urban	UPOR 2002 Rural (R→U)		UPOR 2002 Urban		UPOR 2002 Overseas	
		(Nr)	(%)	(Nr)	(%)	(Nr)	(%)
Total Population	**379,514**	**57,479**	**15.1**	**313,958**	**82.7**	**8,077**	**2.1**
Fijians	**182,622**	**32,669**	**17.9**	**148,217**	**81.2**	**1,736**	**1.0**
Indians	**166,567**	**21,938**	**13.2**	**142,205**	**85.4**	**2,424**	**1.5**
Others	**30,325**	**2,872**	**9.5**	**23,536**	**77.6**	**3,917**	**12.9**

As expected, in all urban areas in 2007, the proportion of persons age five and over with an urban UPOR in 2002 is very significantly higher than the proportion of persons with a rural UPOR in 2002.

- The urban areas with the highest proportion of persons age five and over who had an urban UPOR in 2002 are Vatukoula (88.1 %), Lami (87.3 %), Lautoka (86.7 %), Levuka (86.6 %), Navua (86.4 %) and Nasinu (85.1 %). The urban areas with the lowest proportion urban UPOR in 2002 (less than 75 %) are apart from two small unincorporated townships Seaqaqa and Korovou, the urban areas of Nadi and Ba.

- Of the 313,958 persons age five and over, with an urban UPOR in 2002, the majority (278,173 or 88.6 %) had, in 2002, the same UPOR as in 2007. These persons did not migrate during the five year period 2002-2007. The following overview presents the proportional distribution of the category of persons age five and over with an urban UPOR in 2002 by ethnicity.

Ethnicity	Urban UPOR in 2002	Born in 2007 UPOR (same UA)		Born in Other UA (U→U)	
		(Nr)	(%)	(Nr)	(%)
Total Population	**313,958**	**278,173**	**88.6**	**35,785**	**11.4**
Fijians	148,217	128,832	86.9	19,385	13.1
Indians	142,205	128,941	90.7	13,264	9.3
Others	23,536	20,400	86.7	3,136	13.3

- 57,479 persons age five and over with a rural UPOR in 2002 moved to one of the urban areas between 2002 and 2007. These are the important group of recent rural-urban migrants. Those with an urban UPOR in 2002 are either non-migrants or past migrants (before 2002) or they migrated from another urban area in which case they are urban-urban migrants. Once again, urban-urban migration will not further be discussed in this chapter since it will be included in the forthcoming Census Monograph on urbanization.

- Like lifetime rural to urban migration, recent rural to urban migration is also dominated by movements to Fiji's two agglomerations. This is shown in the following overview:

Urban Area	Lifetime Rural to Urban Migrants	
	Nr	%
Suva	8,740	15.2
Nasinu	11,193	19.5
Lami	2,054	3.6
Greater Suva	21,987	38.3
Nausori	5,605	9.8
Lami-Nausori Corridor*	**27,592**	**48.0**
Nadi	8,787	15.3
Lautoka	6,372	11.1
Nadi-Lautoka Corridor#	**15,159**	**26.4**
Both agglomerations	**42,751**	**74.4**

Note * The comparable proportion for 1996 is 52.2 %
The comparable proportion for 1996 is 20.6 %

It will be noted that these proportions are very similar to those for lifetime rural-urban migration. Rural to urban migration to the urban areas in the Northern and Eastern Division has, with the exception of Labasa (5,245 persons or 9.1 %) remained limited.

- Differential recent migration by ethnicity once again shows the familiar picture of Fijian domination. However, it appears that recent rural to urban migration is even more dominated by Fijians than lifetime rural to urban migration. 56.8 % of all recent migrants from rural to urban areas are Fijians whereas 38.2 % are Indians and 5.0 % are Others. In fact, in 2007, recent rural to urban migration to all urban areas, except Ba, is now

dominated by Fijians. The major urban areas, Nasinu, Nadi, Ba, Lautoka, Nausori and Labasa remain the principal destinations for recent Indian rural to urban migrants.

- The proportion of "Others" amongst those with 2002 UPOR overseas is significantly lower than amongst those with POB overseas. (48.5 % compared to 71.9 %). Not surprisingly, of the 9,594 persons born overseas, 6,895 are "Others". In 2007, of the 8,077 persons age five and over with 2002 UPOR overseas, 3,851 (47.7 %) resided in the urban area Suva.

- Table IX-B6 compares the different types of inter-sectoral recent migration at the national level by ethnicity in 1996 and 2007.

Table IX-B6: Comparison of inter-sectoral recent migration by ethnicity in 1996 and 2007.

Ethnicity	Year	R→U migrants	U→U migrants	U→R migrants
Total Population	**1996**	**31,422**	**34,171**	**14,105**
	2007	**57,479**	**35,785**	**26,027**
Fijians	**1996**	21,552	17,510	10,558
	2007	32,669	19,385	18,861
Indians	**1996**	8,245	13,412	2,427
	2007	21,938	13,264	5,866
Others	**1996**	1,625	3,249	1,120
	2007	2,872	3,136	1,300

2.3. Typology of recent rural to urban migration by "distance travelled"

In this section, the same typology is used as in the case of lifetime migrants in the previous section. Table IX-B7a to d presents the number and proportion of each "distance" category (A, B and C) of recent rural-urban migrants to each of the 2007 Urban Areas. For reasons mentioned, the 1996 figures have not been included in these tables.

The information has been summarized in Table IX-8.

- In the case of recent migration, the most dominant migrant category is not Category C (as for lifetime migrants) but Category A (45.7 %). However, this is entirely due to the large proportion of Indian short-distance migrants to the urban areas in the Western Division.

- As in the case of lifetime migration, by far the least dominant recent migration category is Category B (14.2 %). Once again, this applies to all ethnic groups. The main exceptions are the small urban areas of Navua and Deuba where slightly less than 50 % of all recent rural to urban migrants come from the rural sector of the Central Division (with the exception of Serua).

- Fijian recent rural to urban migrants are almost equally (slightly more than 40 %) Category C migrants (Eastern Division) and Category A migrants (Western Division).

- As in the case of lifetime migration, Indian recent rural to urban migrants are predominantly Category A migrants (53.3 %). This applies once again to migrants to the urban areas in the Western Division. The Ba urban area has once again by far the highest proportion of "short-distance" Indian migrants in Fiji (94.0 %). On the other hand, Indian rural to urban migrants to urban areas in the Central Division (with the exception of Korovou) are predominantly Category C migrants.

Table IX-B7a: Recent rural-urban migration to each of the 2007 Urban Areas derived from 2007 Census data: Total Population

Urban Area (2007)	Recent R→U Migrants (Total Nr)	Category A Recent R→U Migrants		Category B Recent R→U Migrants		Category C Recent R→U Migrants	
		Nr	%	Nr	%	Nr	%
All UAs	**57,479**	**26,249**	**45.7**	**8,140**	**14.2**	**23,090**	**40.2**
Urban Areas in the Western Division							
Lautoka	6,372	3,500	54.9	1,014	15.9	1,858	29.2
Nadi	8,787	5,963	67.9	988	11.2	1,836	20.9
Ba	4,264	3,582	84.0	330	7.7	352	8.3
Sigatoka	1,387	752	54.2	188	13.6	447	32.2
Tavua	436	264	60.6	66	15.1	106	24.3
Rakiraki	639	401	62.8	112	17.5	126	19.7
Vatukoula	397	227	57.2	58	14.6	112	28.2
Urban Areas in the Central Division							
Suva	8,740	2,373	27.2	1,058	12.1	5,309	60.7
Lami	2,054	671	32.7	428	20.8	955	46.5
Nasinu	11,193	1,920	17.2	1,686	15.1	7,587	67.8
Nausori	5,605	2,401	42.8	116	2.1	3,088	55.1
Navua	485	78	16.1	242	49.9	165	34.0
Korovou	81	40	49.4	11	13.6	30	37.0
Deuba	250	39	15.6	111	44.4	100	40.0
Urban Areas in the Northern Division							
Labasa	5,245	3,152	60.1	1,366	26.0	727	13.9
Savusavu	1,014	587	57.9	280	27.6	147	14.5
Nabouwalu	102	23	22.5	33	32.4	46	45.1
Seaqaqa	208	143	68.8	37	17.8	28	13.5
Urban Areas in the Eastern Division							
Levuka	220	133	60.5	16	7.3	71	32.3

Table IX-B7b: Recent rural-urban migration to each of the 2007 Urban Areas derived from 2007 Census data: Fijians

Urban Area (2007)	Recent R→U Migrants (Total Nr)	Category A Recent R→U Migrants		Category B Recent R→U Migrants		Category C Recent R→U Migrants	
		Nr	%	Nr	%	Nr	%
All UAs	**32,669**	**13,439**	**41.1**	**5,532**	**16.9**	**13,698**	**41.9**
Urban Areas in the Western Division							
Lautoka	3,572	1,510	42.3	649	18.2	1,413	39.6
Nadi	5,091	3,262	64.1	467	9.2	1,362	26.8
Ba	1,182	697	59.0	216	18.3	269	22.8
Sigatoka	763	390	51.1	61	8.0	312	40.9
Tavua	286	151	52.8	45	15.7	90	31.5
Rakiraki	423	293	69.3	42	9.9	88	20.8
Vatukoula	214	88	41.1	33	15.4	93	43.5
Urban Areas in the Central Division							
Suva	5,756	1,753	30.5	830	14.4	3,173	55.1
Lami	1,668	501	30.0	365	21.9	802	48.1
Nasinu	6,641	1,388	20.9	1292	19.5	3,961	59.6
Nausori	2,847	1,434	50.4	78	2.7	1,335	46.9
Navua	311	45	14.5	181	58.2	85	27.3
Korovou	74	37	50.0	9	12.2	28	37.8
Deuba	200	31	15.5	97	48.5	72	36.0
Urban Areas in the Northern Division							
Labasa	2,650	1,243	46.9	1006	38.0	401	15.1
Savusavu	612	413	67.5	105	17.2	94	15.4
Nabouwalu	87	22	25.3	23	26.4	42	48.3
Seaqaqa	101	63	62.4	21	20.8	17	16.8
Urban Areas in the Eastern Division							
Levuka	191	118	61.8	12	6.3	61	31.9

Table IX-B7c: Recent rural-urban migration to each of the 2007 Urban Areas derived from 2007 Census data: Indians

Urban Area (2007)	Recent R→U Migrants (Total Nr)	Category A Recent R→U Migrants		Category B Recent R→U Migrants		Category C Recent R→U Migrants	
		Nr	%	Nr	%	Nr	%
All UAs	**21,938**	**11,700**	**53.3**	**2230**	**10.2**	**8,008**	**36.5**
Urban Areas in the Western Division							
Lautoka	2,556	1,890	73.9	331	12.9	335	13.1
Nadi	3,273	2,423	74.0	496	15.2	354	10.8
Ba	3,001	2,820	94.0	107	35.7	74	2.5
Sigatoka	568	335	59.0	122	21.5	111	19.5
Tavua	137	109	79.6	19	13.9	9	6.6
Rakiraki	208	104	50.0	70	33.7	34	16.3
Vatukoula	170	131	77.1	24	14.1	15	8.8
Urban Areas in the Central Division							
Suva	2,269	357	15.7	155	6.8	1,757	77.4
Lami	235	132	56.2	38	16.2	65	27.7
Nasinu	3,981	434	10.9	315	7.9	3,232	81.2
Nausori	2,493	878	35.2	25	1.0	1,590	63.7
Navua	154	26	16.9	56	36.4	72	46.8
Korovou	2	2	100.0	0	0.0	0	0.0
Deuba	8	4	50.0	0	0.0	4	50.0
Urban Areas in the Northern Division							
Labasa	2,433	1,838	75.5	291	12.0	304	12.5
Savusavu	339	137	40.4	165	48.7	37	10.9
Nabouwalu	15	1	6.7	10	66.7	4	26.7
Seaqaqa	95	78	82.1	6	6.3	11	11.6
Urban Areas in the Eastern Division							
Levuka	1	1	100.0	0	0.0	0	0.0

Table IX-B7d: Recent rural-urban migration to each of the 2007 Urban Areas derived from 2007 Census data: Others

Urban Area (2007)	Recent R→U Migrants (Total Nr)	Category A Recent R→U Migrants		Category B Recent R→U Migrants		Category C Recent R→U Migrants	
		Nr	%	Nr	%	Nr	%
All UAs	**2,872**	**1,110**	**38.6**	**378**	**13.2**	**1,384**	**48.2**
Urban Areas in the Western Division							
Lautoka	244	100	41.0	34	13.9	110	45.1
Nadi	423	278	65.7	25	5.9	120	28.4
Ba	81	65	80.2	7	8.6	9	11.1
Sigatoka	56	27	48.2	5	8.9	24	42.9
Tavua	13	4	30.8	2	15.4	7	53.8
Rakiraki	8	4	50.0	0	0.0	4	50.0
Vatukoula	13	8	61.5	1	7.7	4	30.8
Urban Areas in the Central Division							
Suva	715	263	36.8	73	10.2	379	53.0
Lami	151	38	25.2	25	16.6	88	58.3
Nasinu	571	98	17.2	79	13.8	394	69.0
Nausori	265	89	33.6	13	4.9	163	61.5
Navua	20	7	35.0	5	25.0	8	40.0
Korovou	5	1	20.0	2	40.0	2	40.0
Deuba	42	4	9.5	14	33.3	24	57.1
Urban Areas in the Northern Division							
Labasa	162	71	43.8	69	42.6	22	13.6
Savusavu	63	37	58.7	10	15.9	16	25.4
Nabouwalu	0	0	0.0	0	0.0	0	0.0
Seaqaqa	12	2	16.7	10	83.3	0	0.0
Urban Areas in the Eastern Division							
Levuka	28	14	50.0	4	14.3	10	35.7

Table IX-B8: Subdivision of recent rural to urban migrants by ethnicity to each of the urban areas into three categories, A, B and C, derived from 2007 Census data

Urban Area	Total Migrants			Fijian Migrants			Indian Migrants			Other Migrants		
	A	B	C	A	B	C	A	B	C	A	B	C
Urban Areas in the Western Division												
Lautoka	v			v			v					v
Nadi	v			v			v			v		
Ba	v			v			v			v		
Sigatoka	v			v			v			v		
Tavua	v			v			v					v
Rakiraki	v			v			v			v		
Vatukoula	v					v	v			v		
Urban Areas in the Central Division												
Suva			v			v			v			v
Lami			v			v	v					v
Nasinu			v			v			v			v
Nausori			v	v					v			v
Navua		v			v				v			v
Korovou	v			v			v					v
Deuba			v		v				v			v
Urban Areas in the Northern Division												
Labasa	v			v			v			v		
Savusavu	v			v				v		v		
Nabouwalu			v			v		v		-	-	-
Seaqaqa	v			v			v				v	
Urban Areas in the Eastern Division												
Levuka	v			v			v			v		

- Other recent rural to urban migrants are predominantly Category C migrants (48.2 %) but not by far as much as in the case of lifetime migration.
- With regard to recent rural to urban migration, the urban areas in the Western, Northern and Eastern Division attract predominantly short-distance (Category A) migrants whereas most urban areas in the Central Division attract predominantly "long-distance" (Category C) migrants.

X. HOUSEHOLDS AND HOUSING

Chapter X consists of three sections:

- Section 1 considers the data sources
- Section 2 includes a basic analysis of census data at the household level
- Section 3 is concerned with different aspects of the housing situation in Fiji.

As was the case after the 1996 Census, a far more comprehensive analysis of the 2007 Census information on households and housing will be included in a Census Research Monograph. This chapter is therefore restricted to the most basic information. [44]

1. Data sources

The impact of government policies and plans with regard to the housing situation needs to be closely evaluated and monitored. This requires the availability of complete, accurate and up to date information that is collected on a continuous basis. These demanding data requirements can only adequately be met by an efficient system of service statistics. Unfortunately, such a system is not in place. The statutory bodies established by government, the Housing Authority and the Public Rental Board do not have statistical units, tasked with the continuous collection and analysis of service statistics concerning the housing situation. The same applies to the NGOs dealing with issues related to housing. Moreover, the data that is collected by these bodies, deals exclusively with the households occupying houses under their control. For the vast and ever increasing squatter population in Fiji, data on a continuous basis is not available.

In order to fill the data gap to some extent, all Population Censuses since 1986 have been combined with a Census of Housing. This approach of concurrently conducting a census of Population and Housing is recommended by the United Nations. The collection on the same Interview Schedule of demographic and socio-economic information of household members and information concerning the house they occupy has obvious advantages. It offers the possibility of matching the two data sets and consequently, the analysis of the data will become more comprehensive and meaningful.

Housing information collected during the 1986 Census included the number of dwellings and material used for the construction of the walls. The data derived was of special importance for the formulation of housing programmes since it provided the basis for appraising the dwelling inventory in terms of durability and expected rate of replacement. This information also provided the basis for an estimate of the annual rate of dwelling construction during the intercensal period. During the 1996 census, the housing section on the Interview Schedule was significantly extended. In 2007, the housing section on the Interview Schedule was further extended and adapted.

[44] With regard to the housing situation in Fiji, users are also referred to: Walsh, 2006. Fiji: An Encyclopedic Atlas. Chapter 8-10.

2. Households

Households and families are the fundamental units of all societies and information should preferably be available for both. However from the data collection point of view, particularly in censuses, the household is a far more convenient unit of enumeration than the family. With regard to location, the household is usually specific whereas this is often not the case with families. This is particularly important in many developing countries where the family may embrace an entire clan.

Censuses (as well as surveys) conducted in Fiji have always used the household as the basic unit of data collection. It is therefore essential that the concept household and conditions for household membership are precisely defined and known by all census (survey) staff. As during the previous censuses, the 2007 census household was again defined as consisting of

> *"those persons who usually eat together food prepared for them in the same kitchen and who together share the work and cost of providing the food."*

A household may consist of one or more persons and may occupy a whole building, part of a building or many buildings. It is important to stick to the correct interpretation of a household. It should, however be kept in mind that in the majority of cases, the household will be a family living in a single dwelling.

The above household definition implies that:

- Two or more groups of persons living in the same dwelling but each with their own separate eating and housekeeping arrangements are considered as two or more separate households.

- A domestic servant eating with the household is included with this household. However, if this domestic servant cooks and eats separately, he/she will be considered as a separate household.

The analysis in this section is restricted to households residing in private dwellings (PD). An analysis of institutionalized households residing in non-private dwellings will be covered in the 2007 Census Research Monograph.

2.1. Households by ethnicity and geographic sector

Table X-1 presents the number of households and persons by ethnicity and geographic sector, enumerated in Fiji during the 1996 and 2007 Censuses. Some households consist of persons with a different ethnic background. These households have been classified according the ethnicity of the head of household. As expected, during the most recent intercensal period 1996-2007, the proportion of Fijian households has drastically increased whereas the proportion of Indian households has drastically decreased. This is the case for both geographic sectors but more so for the rural than for the urban sector.

Table X-1: Households and persons in these households (nr and %) by ethnicity and geographic sector in 1996 and 2007.

Ethnicity	All Sectors				Rural Sector				Urban Sector			
	Households*		Persons		Households*		Persons		Households*		Persons	
	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%
2007 Census												
Total	**174,117**	**100.0**	**829,932**	**100.0**	**85,588**	**100.0**	**409,529**	**100.0**	**88,529**	**100.0**	**420,403**	**100.0**
Fijian	88,826	51.0	470,328	56.7	51,865	60.6	261,864	63.9	36,961	41.8	208,464	49.6
Indian	74,601	42.8	312,646	37.7	31,032	36.3	135,672	33.1	43,569	49.2	176,974	42.1
Other	10,690	6.1	46,958	5.7	2,691	3.1	11,993	2.9	7,999	9.0	34,965	8.3
1996 Census												
Total	**144,239**	**100.0**	**767,756**	**100.0**	**76,555**	**100.0**	**413,726**	**100.0**	**67,684**	**100.0**	**354,030**	**100.0**
Fijian	66,782	46.3	389,114	50.7	41,215	53.8	230,961	55.8	25,567	37.8	158,153	44.7
Indian	68,978	47.8	337,606	44.0	33,088	43.2	170,647	41.2	35,890	53.0	166,959	47.2
Other	8,479	5.9	41,036	5.3	2,252	2.9	12,118	2.9	6,227	9.2	28,918	8.2

Note *These are households living in private dwellings (PD) only

2.2. Average household size

The average household size at the time of the 1996 and 2007 Censuses is presented in Table X-2.Users are again reminded that the averages in this table only include households residing in private dwellings (PD). The inclusion of households in non-private dwellings (NPD) would lead to meaningless averages. During the intercensal period, the average household size for all sub-populations by ethnicity and geographic sector has continued to decrease.

Table X-2: Average household size by ethnicity and geographic sector in 1996 and 2007

Census	Ethnicity	All Sectors	Rural Sector	Urban Sector
2007	**Total**	**4.8**	**4.8**	**4.7**
	Fijians	5.3	5.0	5.6
	Indians	4.2	4.4	4.1
	Others	4.4	4.5	4.4
1996	**Total**	**5.3**	**5.4**	**5.2**
	Fijians	5.8	5.6	6.2
	Indians	4.9	5.2	4.7
	Others	4.8	5.4	4.6

2.3 Distribution of households by number of occupants

This section deals with the distribution of households by number of occupants. In Table X-3a-c, this information is presented by ethnicity for each of the geographic sectors. The figures for 2007 are compared with those of 1996. During the 1996-2007 intercensal period, there has been a clear move towards lower average occupancy and this applies to all subgroups of the population by ethnicity and geographic sector.

Table X-3a: Distribution of households by number of occupants by ethnicity in 1996 and 2007: All Sectors

Ethnicity	Year	Nr/ %	Total Hhs	Number of Households with Occupancy									
				1	2	3	4	5	6	7	8	9	10+
Total	**2007**	**Nr**	**174,100**	**9,897**	**20,707**	**27,203**	**32,641**	**28,460**	**21,013**	**13,448**	**9,158**	**4,098**	**7,475**
		%	**100.0**	**5.7**	**11.9**	**15.6**	**18.7**	**16.3**	**12.1**	**7.7**	**5.3**	**2.4**	**4.3**
	1996	**Nr**	**144,239**	**5,472**	**12,162**	**18,175**	**25,373**	**25,284**	**20,030**	**13,388**	**8,665**	**5,436**	**10,254**
		%	**100.0**	**3.8**	**8.4**	**12.6**	**17.6**	**17.5**	**13.9**	**9.3**	**6.0**	**3.8**	**7.1**
Fijian	**2007**	**Nr**	88,813	5,143	9,162	11,845	13,268	13,274	11,767	8,644	6,628	3,071	6,011
		%	99.9	5.8	10.3	13.3	14.9	14.9	13.2	9.7	7.5	3.5	6.8
	1996	**Nr**	66,782	2,922	5,574	7,654	8,986	9,452	9,114	7,170	5,189	3,514	7,207
		%	100.0	4.4	8.3	11.5	13.5	14.2	13.6	10.7	7.8	5.3	10.8
Indian	**2007**	**Nr**	74,599	3,694	9,973	13,758	17,596	13,708	8,086	4,042	1,971	787	984
		%	100.0	5.0	13.4	18.4	23.6	18.4	10.8	5.4	2.6	1.1	1.3
	1996	**Nr**	68,978	1,881	5,473	9,421	15,054	14,650	9,952	5,532	2,977	1,615	2,423
		%	100.0	2.7	7.9	13.7	21.8	21.2	14.4	8.0	4.3	2.3	3.5
Other	**2007**	**Nr**	10,688	1,060	1,572	1,600	1,777	1,478	1,160	762	559	240	480
		%	100.0	9.9	14.7	15.0	16.6	13.8	10.9	7.1	5.2	2.3	4.5
	1996	**Nr**	8,479	669	1,115	1,100	1,333	1,182	964	686	499	307	624
		%	100.0	7.9	13.2	13.0	15.7	13.9	11.4	8.1	5.9	3.6	7.4

Table X-3b: Distribution of households by number of occupants by ethnicity in 1996 and 2007: Rural Sector

Ethnicity	Year	Nr/	Total	Number of Households with Occupancy									
		%	Hhs	1	2	3	4	5	6	7	8	9	10+
Total	**2007**	**Nr**	**85,578**	**4,807**	**9,863**	**13,273**	**15,596**	**14,372**	**10,795**	**6,986**	**4,597**	**1,953**	**3,336**
		%	**100**	**5.6**	**11.5**	**15.5**	**18.2**	**16.8**	**12.6**	**8.2**	**5.4**	**2.3**	**3.9**
	1996	**Nr**	**76,555**	**2626**	**6027**	**9252**	**12683**	**13600**	**11407**	**7639**	**4926**	**3017**	**5378**
		%	**100.0**	**3.4**	**7.9**	**12.1**	**16.6**	**17.8**	**14.9**	**10.0**	**6.4**	**3.9**	**7.0**
Fijian	**2007**	**Nr**	51,855	3,253	5,789	7,574	8,101	7,892	6,655	4,808	3,529	1,528	2,726
		%	100	6.3	11.2	14.6	15.6	15.2	12.8	9.3	6.8	2.9	5.3
	1996	**Nr**	41215	1843	3642	5007	5716	5987	5790	4410	3086	1987	3747
		%	100.0	4.5	8.8	12.1	13.9	14.5	14.0	10.7	7.5	4.8	9.1
Indian	**2007**	**Nr**	31,032	1,282	3,670	5,314	7,080	6,109	3,827	1,977	922	368	483
		%	100	4.1	11.8	17.1	22.8	19.7	12.3	6.4	3	1.2	1.6
	1996	**Nr**	33,088	645	2,152	3,980	6,622	7,302	5,358	3,022	1,686	919	1,402
		%	100	1.9	6.5	12	20	22.1	16.2	9.1	5.1	2.8	4.2
Other	**2007**	**Nr**	2,691	272	404	385	415	371	313	201	146	57	127
		%	99.9	10.1	15	14.3	15.4	13.8	11.6	7.5	5.4	2.1	4.7
	1996	**Nr**	2,252	138	233	265	345	311	259	207	154	111	229
		%	100	6.1	10.3	11.8	15.3	13.8	11.5	9.2	6.8	4.9	10.2

Table X-3c: Distribution of households by number of occupants by ethnicity in 1996 and 2007: Urban Sector

Ethnicity	Year	Nr/ %	Total Hhs	Number of Households with Occupancy									
				1	2	3	4	5	6	7	8	9	10+
Total	**2007**	**Nr**	**88,522**	**5,090**	**10,844**	**13,930**	**17,045**	**14,088**	**10,218**	**6,462**	**4,561**	**2,145**	**4,139**
		%	**100.0**	**5.7**	**12.3**	**15.7**	**19.3**	**15.9**	**11.5**	**7.3**	**5.2**	**2.4**	**4.7**
	1996	**Nr**	**67,684**	**2,846**	**6,135**	**8,923**	**12,690**	**11,684**	**8,623**	**5,749**	**3,739**	**2,419**	**4,876**
		%	**100.0**	**4.2**	**9.1**	**13.2**	**18.7**	**17.3**	**12.7**	**8.5**	**5.5**	**3.6**	**7.2**
Fijian	**2007**	**Nr**	36,958	1,890	3,373	4,271	5,167	5,382	5,112	3,836	3,099	1,543	3,285
		%	100.0	5.1	9.1	11.6	14.0	14.6	13.8	10.4	8.4	4.2	8.9
	1996	**Nr**	25,567	1,079	1,932	2,647	3,270	3,465	3,324	2,760	2,103	1,527	3,460
		%	100.0	4.2	7.6	10.4	12.8	13.6	13.0	10.8	8.2	6.0	13.5
Indian	**2007**	**Nr**	43,567	2,412	6,303	8,444	10,516	7,599	4,259	2,065	1,049	419	501
		%	99.9	5.5	14.5	19.4	24.1	17.4	9.8	4.7	2.4	1.0	1.1
	1996	**Nr**	35,890	1,236	3,321	5,441	8,432	7,348	4,594	2,510	1,291	696	1,021
		%	100.0	3.4	9.3	15.2	23.5	20.5	12.8	7.0	3.6	1.9	2.8
Other	**2007**	**Nr**	7,997	788	1,168	1,215	1,362	1,107	847	561	413	183	353
		%	100.0	9.9	14.6	15.2	17.0	13.8	10.6	7.0	5.2	2.3	4.4
	1996	**Nr**	6,227	531	882	835	988	871	705	479	345	196	395
		%	100.0	8.5	14.2	13.4	15.9	14.0	11.3	7.7	5.5	3.1	6.3

3. Housing situation

Shelter, like water and food are universally considered as basic human needs. Service delivery with regard to these basic needs has, for a long time, been one of the priority areas of government policy and planning. Meeting the housing needs of the population has, in the last few decades, become increasingly more urgent and difficult with the fast increase in Fiji's squatter population. A large proportion of these squatters can be found in Naitasiri Province.

This section compares some of the housing information collected during the 1996 and 2007 censuses. Users should again keep in mind that:

- All information refers to private dwellings and households residing in private dwellings
- All information has been specified by ethnicity. This refers to the ethnicity of the person who, during the field operation, has been identified as the head of the household.
- The basic tables of the 2007 and 1996 Census provide far more information than can be summarized in this chapter. For instance, these basic tables provide the same information at the provincial level by ethnicity. Those who need this more detailed information are asked to contact the FBoS.

3.1. Distribution of households by number of rooms

Table X-4 presents the distribution of households by the number of rooms available to household members. The proportional (%) distribution is also included. The proportion of Fijian households occupying only one or two rooms is very significantly larger than in the case of Indian households. Furthermore, between 1996 and 2007, the number of households occupying only one room has decreased very drastically for Fijians and marginally for Indians.

3.2. Utilities

Table X-5, 6 and 7 compare the availability of water, electricity and toilet facilities in 1996 and 2007. The information is again provided for the main ethnic groups.

With regard to water, between 1996 and 2007, the proportion of households with access to a safe supply (metered, communal and roof-tank) has increased from 83.4 percent to 89.7 percent. The increase in electricity supply during the same period has been far more significant, from 66.9 percent in 1996 to 88.9 percent in 2007. The improvement is mainly due to improvement in FEA supply and in the case of Fijian households also village power. All other sources of electricity, with the exception of own plant; have not contributed very much to the improvement in electricity supply in Fiji.

In 2007, far more households have modern toilet facilities than in 1996. In 2007, 73.2 percent has modern facilities and 69.7 percent of all households have an exclusive flush toilet. On the other hand, in 2007, 1.3 percent of all households still uses a shared pit latrine or has no toilet facilities at all.

Table X-4: Distribution of households by number of rooms by ethnicity in 1996 and 2007

Ethnicity	Year		Total Hhs	Number of rooms in private dwelling:												
				1	2	3	4	5	6	7	8	9	10	11	12+
Total Hhs	**2007**	**Nr**	**174,117**	**22,061**	**25,312**	**32,545**	**39,274**	**30,271**	**14,218**	**5,732**	**2,266**	**1,042**	**509**	**583**	**304**
		%	**100.0**	**12.7**	**14.5**	**18.7**	**22.6**	**17.4**	**8.2**	**3.3**	**1.3**	**0.6**	**0.3**	**0.3**	**0.2**
	1996	**Nr**	**144,239**	**26,718**	**23,765**	**27,677**	**30,385**	**19,173**	**9,768**	**3,510**	**2,338**	**905**			
		%	**100.0**	**18.5**	**16.5**	**19.2**	**21.1**	**13.3**	**6.8**	**2.4**	**1.6**	**0.6**			
Fijian Hhs	**2007**	**Nr**	88,826	17,179	16,183	18,243	17,741	11,025	4,797	1,971	714	364	190	297	122
		%	99.9	19.3	18.2	20.5	20.0	12.4	5.4	2.2	0.8	0.4	0.2	0.3	0.1
	1996	**Nr**	66,782	21,236	12,899	12,903	10,284	5,530	2,215	766	577	372			
		%	100.0	31.8	19.3	19.3	15.4	8.3	3.3	1.1	0.9	0.6			
Indian Hhs	**2007**	**Nr**	74,601	3,791	7,626	12,458	19,184	17,194	8,424	3,344	1,345	585	256	247	147
		%	99.9	5.1	10.2	16.7	25.7	23.0	11.3	4.5	1.8	0.8	0.3	0.3	0.2
	1996	**Nr**	68,978	4,609	9,933	13,122	18,110	12,104	6,777	2,412	1,463	448			
		%	100.0	6.7	14.4	19.0	26.3	17.5	9.8	3.5	2.1	0.6			
Other Hhs	**2007**	**Nr**	10,690	1,091	1,503	1,844	2,349	2,052	997	417	207	93	63	39	35
		%	100.0	10.2	14.1	17.2	22.0	19.2	9.3	3.9	1.9	0.9	0.6	0.4	0.3
	1996	**Nr**	8,479	873	933	1,652	1,991	1,539	776	332	298	85			
		%	100.0	10.3	11.0	19.5	23.5	18.2	9.2	3.9	3.5	1.0			

Table X-5: Main water supply in private dwellings by ethnicity of head of household in 1996 and 2007

Type	All Households				Fijian Households				Indian Households			
	1996		2007		1996		2007		1996		2007	
	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%
Total	**144,617**	**100.0**	**174,117**	**100.0**	**66,998**	**100.0**	**88,826**	**100.0**	**69,047**	**100.0**	**74,601**	**100.0**
Safe	120,620	83.4	156,189	89.7	58,472	87.3	80,469	90.6	54,133	78.4	65,465	87.8
-Metered	86,684	59.9	116,824	67.1	31,739	47.4	48,601	54.7	48,177	69.8	59,493	79.7
-Communal	29,944	20.7	32,946	18.9	24,007	35.8	27,000	30.4	4,954	7.2	4,723	6.3
-Roof tank	3,992	27.6	6,419	3.7	2,726	4.1	4,868	5.5	1,002	1.5	1,249	1.7
Unsafe	23,997	16.6	17,928	10.3	8,526	12.7	8,357	9.4	14,914	21.6	9,136	12.2
-Well	13,404	9.3	10,714	6.2	3,136	4.7	3,356	3.8	10,107	14.6	7,173	9.6
-River/Creek	5,887	4.1	6,352	3.6	3,927	5.9	4,417	5.0	1,770	2.6	1,773	2.4
-Other	4,706	3.3	862	0.5	1,463	2.2	584	0.7	3,037	4.4	190	0.3

Table X-6: Electricity supply in private dwellings by ethnicity of head of household in 1996 and 2007

Electricity Supply	All Households				Fijian Households				Indian Households			
	1996		2007		1996		2007		1996		2007	
	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%
Total	**144,617**	**100.0**	**174,117**	**100.0**	**66,998**	**100.0**	**88,826**	**100.0**	**69,047**	**100.0**	**74,601**	**100.0**
Yes	96,756	66.9	154,766	88.9	35,662	53.2	74,072	83.4	54,065	78.3	70,697	94.8
-FEA	83,031	57.4	129,749	74.5	26,707	39.9	55,276	62.2	50,198	72.7	65,987	88.5
-FSC	551	0.4	514	0.3	277	0.4	229	0.3	218	0.3	246	0.3
-Vatukoula	639	0.4	537	0.3	403	0.6	353	0.4	128	0.2	124	0.2
-Village Power	5,178	3.6	12,059	6.9	4,831	7.2	11,085	12.5	89	0.1	204	0.3
-PWD	534	0.4	1,967	1.1	438	0.7	1,220	1.4	70	0.1	619	0.8
-Home solar	-	-	1,561	0.9	-	-	869	1.0	-	-	596	0.8
-Own plant	6,823	4.7	8,397	4.8	3,006	4.5	5,040	5.7	3,362	4.9	2,921	3.9
No	47,861	33.1	19,333	11.1	31,336	46.8	14,754	16.6	14,982	21.7	3,904	5.2

Table X-7: Toilet facilities in private dwellings by ethnicity of head of household in 1996 and 2007

Toilet facilities	All Households				Fijian Households				Indian Households			
	1996		2007		1996		2007		1996		2007	
	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%
Total	**144,617**	**100.0**	**174,117**	**100.0**	**66,998**	**100.0**	**88,826**	**100.0**	**69,047**	**100.0**	**74,601**	**100.0**
Modern	67,**159**	46.4	127,401	73.2	23,307	34.8	56,300	63.4	37,240	53.9	61,789	82.8
-Flush (exclusive)	63,070	43.6	121,353	69.7	21,579	32.2	52,983	59.6	35,087	50.8	59,323	79.5
-Flush (shared)	4,089	2.8	6,048	3.5	1,728	2.6	3,317	3.7	2,153	3.1	2,466	3.3
Non-modern	77,458	53.6	46,716	26.8	43,691	65.2	32,526	36.6	31,807	46.1	12,812	17.2
-Sealed privy (excl)	28,816	19.9	21,009	12.1	24,159	36.1	17,810	20.1	3,474	5.0	2,368	3.2
-Sealed privy (shared)	3,749	2.6	1,425	0.9	2,991	4.5	1,110	1.2	644	0.9	250	0.3
-Pit latrine (excl)	38,362	26.5	21,841	12.5	12,845	19.2	11,880	13.4	25,007	36.2	9,548	12.8
-Pit latrine (shared)	4,788	3.3	1,023	0.6	2,133	3.2	628	0.7	2,570	3.7	382	0.5
-None	1,547	1.1	1,202	0.7	1,411	2.1	989	1.1	73	0.1	171	0.2
-Other	196	0.1	216	0.1	152	0.2	109	0.1	39	0.1	93	0.1

Table X-8: Dwelling adequacy of private dwellings by ethnicity of head of household in 1996 and 2007

Dwelling Adequacy	All Households				Fijian Households				Indian Households			
	1996		2007		1996		2007		1996		2007	
	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%
Total	**144,617**	**100.0**	NA	NA	66,998	**100.0**	NA	NA	**69,047**	**100.0**	NA	NA
Superior	8,053	5.6	NA	NA	2,009	3.0	NA	NA	4,453	6.4	NA	NA
Well above average	16,773	11.6	NA	NA	5,862	8.7	NA	NA	8,975	13.0	NA	NA
Average	46,577	32.2	NA	NA	19,976	29.8	NA	NA	23,877	34.6	NA	NA
Well below average	35,797	24.8	NA	NA	16,834	25.1	NA	NA	17,548	25.4	NA	NA
Inferior	36,479	25.2	NA	NA	21,547	32.2	NA	NA	14,042	20.3	NA	NA
Other	938	0.6	NA	NA	770	1.1	NA	NA	152	0.2	NA	NA

Table X-9: Tenure of living quarters of private dwellings by ethnicity of head of household in 1996 and 2007

Type of Tenure	All Households				Fijian Households				Indian Households			
	1996		2007		1996		2007		1996		2007	
	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%
Total	**144,617**	**100.0**	174,117	100.0	**66,998**	**100.0**	**88,826**	**100.0**	**69,047**	**100.0**	**74,601**	**100.0**
Own/With mortg.	94,300	65.2	128,917	74.0	40,625	60.6	66,940	75.4	49,066	71.1	55,459	74.3
Total non-own)	50,317	34.8	45,200	26.0	26,373	39.4	21,886	24.6	19,981	28.9	19,142	25.7
-Rent-Private landl.	14,866	10.3	24,682	14.2	4,667	7.0	8,978	10.1	8,084	11.7	12,754	17.1
-Rent-Public Board	3,442	2.4	2,835	1.6	1,813	2.7	1,846	2.1	1,375	2.0	769	1.0
-Govt/Inst housing	5,282	3.7	6,370	3.7	3,394	5.1	4,587	5.2	1,289	1.9	1,392	1.9
-Occup-Employer	2,927	2.0	2,626	1.5	1,431	2.1	1,588	1.8	1,176	1.7	848	1.1
-No rent-Informal	16,301	11.3	3,161	1.8	9,320	13.9	1,576	1.8	6,459	9.4	1,422	1.9
-Other	7,499	5.2	5,526	3.2	5,748	8.6	3,311	3.7	1,598	2.3	1,957	2.6

Table X-10: Tenure of land (with private dwelling) by ethnicity of head of household in 1996 and 2007

Type of tenure	All Households				Fijian Households				Indian Households			
	1996		2007		1996		2007		1996		2007	
	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%
Total	**144,617**	**100.0**	174,117	100.0	66,**998**	**100.0**	**88,826**	**100.0**	**69,047**	**100.0**	**74,601**	100.0
Owned outright	26,594	18.4	38,604	22.2	8,029	12.0	13,857	15.6	14,991	21.7	19,167	25.7
Total not owned outright	118,023	81.6	135,513	77.8	58,969	88.0	74,969	84.4	54,056	78.3	55,434	74.3
-Leased from state	27,849	19.3	30,076	17.3	7,627	11.4	10,292	11.6	18,643	27.0	17,852	23.9
-Leased from NLTB	37,722	26.1	41,366	23.8	9,344	13.9	12,964	14.6	26,823	38.8	26,626	35.7
-Occup.- Non-legal	5,770	4.0	4,563	2.6	1,802	2.7	1,839	2.1	3,693	5.3	2,601	3.5
-Occup.-NLTB	4,338	3.0	8,125	4.7	2,556	3.8	4,268	4.8	1,662	2.4	3,617	4.8
-Traditional village tenure	35,647	24.6	47,226	27.1	33,757	50.4	43,848	49.4	1,045	1.5	2,587	3.5
-Other	6,697	4.6	4,157	2.4	3,883	5.8	1,758	2.0	2,190	3.2	2,151	2.9

Table X-11: Households (nr and %) in private dwellings, owning major appliances, by ethnicity of head of household in 1996 and 2007

Appliances	All Households				Fijian Households				Indian Households			
	1996		2007		1996		2007		1996		2007	
	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%	Nr	%
Total nr of households	**144,617**	**100.0**	**174,117**	**100.0**	**66,998**	**100.0**	**88,826**	**100.0**	**69,047**	**100.0**	**74,601**	**100.0**
Households with household item:												
-Refrigerator/freezer	67,211	46.5	106,619	61.2	20,730	30.9	41,826	47.1	40,487	58.6	56,762	76.1
-Washing machine	29,722	20.6	82,027	47.1	8,551	12.8	32,462	36.5	16,874	24.4	42,319	56.7
-Clothes dryer (2007)	NA	NA	25,283	14.5	NA	NA	10,377	11.7	NA	NA	12,365	16.6
-Gas/electric stove	81,519	56.4	NA	NA	25,842	38.6	NA	NA	49,311	71.4	NA	NA
-Water heater (2007)	NA	NA	14,289	8.2	NA	NA	3,437	3.9	NA	NA	7,934	10.6
-Air conditioner (2007)	NA	NA	6,536	3.8	NA	NA	1,450	1.6	NA	NA	3,684	4.9
-Home solar system (2007)	NA	NA	6,878	2.3	NA	NA	2,068	2.3	NA	NA	3,622	4.9
-Energy saving light bulbs (2007)	NA	NA	35,740	20.5	NA	NA	13,091	14.7	NA	NA	19,284	25.8
Households with communication system:												
-Telephone (1996)	39,347	27.2	-	-	9,570	14.3	-	-	25,234	36.5	-	-
.Land L./E Tel) (2007)	NA	NA	66,769	38.3	NA	NA	26,947	30.3	NA	NA	34,351	46.0
.Mobile phone (2007)	NA	NA	116,219	66.7	NA	NA	46,942	52.8	NA	NA	61,709	82.7
-Computer/laptop (2007)	NA	NA	29,682	17.0	NA	NA	9,888	11.1	NA	NA	15,687	21.0
-Video/TV (1996)	66,491	46.0	-	-	19,851	29.6	-	-	41,009	59.4	-	-
.TV (2007)	NA	NA	122,353	70.3	NA	NA	51,046	57.5	NA	NA	63,460	85.1
.Video/DVD (2007)	NA	NA	110,563	63.5	NA	NA	45,291	51.0	NA	NA	57,787	77.5
.Sky plus (2007)	NA	NA	12,417	7.1	NA	NA	4,361	4.9	NA	NA	6,888	9.2
.Sky Pac/PBS (2007)	NA	NA	10,942	6.3	NA	NA	3,235	3.6	NA	NA	6,114	8.2
-Radio/stereo (2007)	NA	NA	142,384	81.8	NA	NA	66,091	74.4	NA	NA	68,253	91.5
Households with means of transport:												
-Car/van	24,027	16.6	46,705	26.8	3,056	4.6	12,193	13.7	18,395	26.6	31,003	41.6
-Carrier/truck/tractor*	9,763	6.8	10,439	6.0	1,458	2.2	2,228	2.5	7,699	11.2	7,399	9.9
Households with other appliances:												
-Outboard motor	4,215	2.9	5,525	3.2	2,604	3.9	3,374	3.8	1,023	1.5	1,282	1.7
-Water pump	2,244	1.6	4,410	2.5	396	0.6	863	1.0	1,676	2.4	2,925	3.9
-Generator (2007)	NA	NA	13,202	7.6	NA	NA	7,820	8.8	NA	NA	4,214	5.6
-Brush cutter/Lawn mower (2007)	NA	NA	43,650	25.1	NA	NA	17,510	19.7	NA	NA	23,217	31.1

Note * 2007 Tractor has been added

3.3. Living quarters and land tenure

In 1996, ownership of living quarters (with or without mortgage) was still far more common for Indian than for Fijian households. Table X-9 shows that, between 1996 and 2007, there has been a sharp increase in house ownership (with or without mortgage) for Fijians from 60.6 percent to 75.4 percent. During the same period, Indian house ownership increased from 71.1 percent to 74.3 percent. Most of the households that do not own their house rent from a private landlord, especially in the case of Indian households.

Table X-10 shows that ownership of the land (on which the living quarters is located) is far less common than ownership of living quarters (Table X-10). In 1996, only 18.4 percent of all households owned the land on which their living quarters is located. In 2007, this has increased to 22.2 percent. Furthermore, it is more common for Indian (25.7 %) than for Fijian households (15.6 %) to own this land. Most households that do not own this land, either lease from the state or the NLTB, or (in the case of Fijian households) have traditional village tenure.

3.4. Household ownership of major appliances

In 2007, several items have been added to the 1996 Census list of major appliances. For those items for which a comparison can be made (refrigerator and washing machine), it is clear that household ownership of these items has very significantly increased during the most recent intercensal period. This applies to Fijian as well as Indian household. In 2007, for all items (apart from a generator), it remains more common that they are owned by an Indian than by a Fijian household. The same also applies to means of communication (i.e. telephone and computer).

During the 1996-2007 intercensal period, car/van ownership has also increased significantly from 16.6 percent to 26.8 percent. However, in 2007, three times more Indian than Fijian households own a car or van.

4. Final comment

During the intercensal period 1996-2007, the household and housing situation for all households (Fijian, Indian and Other) Fiji has improved significantly. However, in 2007, the situation is still far more favorable for Indian than for Fijian households. In Chapter VII (Mortality) it is shown that this improvement in the material sense has, unfortunately not been accompanied by an improvement in the morbidity and mortality situation in the country. It is even possible that the improvement in the material conditions of households in Fiji has inadvertently contributed to the stagnation in the mortality transition, i.e. through an increase in lifestyle disease.

XI SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

Chapter XI consists of three parts, A, B and C.

- Part A provides a brief summary of the findings in this Analytical Report.
- Part B makes some recommendations (based on experiences during the 2007 Census) concerning the preparation phase, field operation and data processing of the next census
- Part C lists several census related topics that require further in-depth research. All items have been included on the census-related research agenda of the FBoS.

A. SUMMARY OF FINDINGS

This Analytical Report of the 2007 Census of Population and Housing presents the results of the analysis of this census and compares them with those obtained from previous censuses, especially the 1996 Census.

A1. POPULATION CHARACTERISTICS

1. Population size and growth

The 2007 Census was a de-facto enumeration. All people who were in Fiji on the night of 16 September 2007 were enumerated at the place where they spent that night. The census enumerated 837,271 persons of which 427,160 are males and 410,111 are females. Furthermore, 475,739 are Fijians, 313,801, Indians and 47,731 "Others". The average rate of growth of the total population during the intercensal period 1996-2007 is 0.7 percent per year. During the previous intercensal period 1986-1996 the average growth rate was 0.8 percent per year. More than half of the total intercensal growth occurred in Naitasiri Province and within this province 95 percent of growth occurred in the urban sector of Naitasiri Tikina (Nasinu Urban Area).

The overall growth rate of 0.7 percent during the most recent intercensal period (implying a doubling time of 99 years) is somewhat surprising since it was expected that, due to drastic decrease in fertility and very significant emigration (mainly of Indians), the overall population growth rate would have dropped more. It suggests that coverage during the 2007 Census may have been somewhat more complete than during the 1996 Census. Reasonable coverage in 2007 is also suggested by the closeness of the population age 21 and over enumerated during the 2007 census and the projected population age 21 and over on the Electoral Roll on Census Night 16 September 2007, especially in the case of the Fijians. During the intercensal period 1996-2007, the proportion of the population that has been classified as urban increased from 46 percent to slightly more than 50 percent.

Between 1996 and 2007, the growth of the Fijian component of the population averaged 1.7 percent per year. This is only marginally lower than during the previous intercensal period (1.8 percent per year). On the other hand, during the most recent intercensal period, the decrease in the Indian population accelerated even more and reached a level of -0.7 percent per year.

2. Population distribution and density

In 2007, the distribution of the population remains very unequal with 79.1 percent of the population in Viti Levu (Central and Western Division) and 16.2 percent in Vanua Levu (Northern Division). The remainder of 4.7 percent resides in the four small island provinces of the Eastern Division. The latter proportion continues to decrease at a fast rate, due to major out-migration from these provinces.

The population of Viti Levu is almost equally divided over the Central Division (40.9 percent) and the Western Division (38.2 percent). However, this balance is also changing. Presently, Ba with 231,760 persons is still the province with by far the largest population (27.7 percent of the total population). However, Naitasiri with a population 160,760 (19.2 percent of the total population) has a much higher rate of population growth than Ba. Given continuation of the present rates Naitasiri will overtake Ba in 2033.

Rewa, with its relatively small land area and large urban population remains the most densely populated province. Another densely populated area of the country is the Nasinu urban area in Naitasiri Tikina.

3. Age and sex structure

Since virtually all demographic and socio-economic characteristics of a population are age (as well as sex) specific, age can be considered as the central demographic variable. Accuracy of age reporting is therefore very important. During the last few decades, it has reached a high level of precision. However, age reporting during the 2007 Census was slightly less precise than in 1996. This is almost certainly not related to any deterioration in the reporting of age but may be due to the fact that the 2007 Census data has been scanned for the first time.

Due to the continuing fertility transition, the age-sex structure of the population continues to narrow at the base. However, this occurs at a very fast rate for Indians and at a moderate rate for Fijians. From the onset of the Indian fertility transition in the late 1950s, this transition has progressed at a very fast and possibly even unprecedented rate (certainly by South Pacific standards). As a result, the level of Indian youth dependency has decreased and the median age increased dramatically. Old age dependency is on the increase and will almost certainly continue to increase at an accelerated pace in the near future.

Because of the rather modest progress of the fertility transition of Fijians, the age-sex structure of this population still has a very significant potential for further growth.

4. Marital status

As in the case of the age-sex structure, trends in marital status that started long ago have continued during the 1996-2007 intercensal period. The proportion of never married males and females continues to increase and the proportion of married males and females continues to decrease. Widowhood is also on the increase. Due to the higher life expectancy of females and the lower age at marriage of females, the proportion of widows is much larger than that of widowers. Between 1946 and 2007, the average age at first marriage for Fijian males and females has increased. During the 61 year period, the average age at first marriage for males changed from 25.8 years to 28.2 years and for females from 22.1 to 24.7 years.

During the same period, the change in Indian age of marriage was dramatic. For males the average age at first marriage increased from 18.3 to 27.0 years and for females from 15.4 to 23.0

years. The enormous gap between Fijian and Indian age at first marriage that existed in 1946 has, in 2007 almost disappeared.

5. Labour force, employment and unemployment

Since the 1980s, Fiji has adopted the labour force criteria of the International Classification of Labour Force Statisticians (ICLS). In this Analytical report, all labour force, employment and unemployment indices are in accordance with the ICLS labour force criteria, unless otherwise stated.

Labour force participation in 2007 is somewhat lower than in 1996 and is, in both years higher for males than for females. However, this does not mean that female labour force participation is low. Labour force participation for Fijian females is actually quite high but this is mainly due to the fact that many rural Fijian females are engaged in subsistence activities and are, therefore included in the labour force.

Between 1996 and 2007, the number of employed increased by only 4.1 percent. This is at about half the rate at which the population has been growing during the same period (8.0 percent). The 2007 Census provides, for the first time, detailed information for seven categories of employed persons. By far the largest category is that of the pure wage/salary workers without any other economic activity.

The number of employed persons with money income (wage/salary earners and self-employed/business) has increased from 219,314 to 240,908, which is an increase of 9.8 percent over the 11 year period. This is slightly higher than the growth rate of the total population. The category of pure subsistence workers (under the ICLS definition these are also employed), has, however decreased during this period from 67,332 to 57,368. This is a decrease of -14.8 percent.

With regard to the labour force, the most important finding probably is that, during the period 1996-2007, the number of unemployed has drastically increased from 11,214 to 28,220. This is an increase of 153.7 percent over the eleven year period. As a result, the unemployment rate, (unemployed as a percentage of the labour force or economically active population) increased from 3.7 percent in 1996 to 8.6 percent in 2007. In interpreting this large increase, it must be kept in mind that, both in 1996 and in 2007, subsistence workers looking for paid employment, have, according to the ICLS definition, not been included in the category unemployed. Users who wish to include them are referred to Chapter IV. In order to maintain comparability, they should ensure that they apply the same criteria to the 2007 and 1996 data.

Furthermore, in order to maintain comparability with the 1996 Census, those who, in 2007, were available for work but not actively looking for work (unemployed according to the ILO definition) have not been included in the category unemployed. The ILO definition cannot be applied to the 1996 Census data. In order to avoid confusion about this sensitive issue, the 2007 unemployment rates according to the ILO definition are not published in this Analytical Report.

The variation in the level of unemployment by sex, ethnicity, and geographic sector and in the 15 provinces is very substantial. For a detailed picture of the large variability in unemployment, see Chapter IV.

On request of the Census Users Advisory Committee, the 2007 Census has attempted to measure child labour (for children aged 10-14). Understandably, it seems that many census respondents have been reluctant to report that a child is kept out of school and is illegally engaged in economic activity.

Finally, the labour force, employment and unemployment situation and trend in Fiji will be investigated in more detail in a forthcoming USP/UNFPA Census Research Monograph.

6. Education and literacy

Since, 1996, the gender distribution of the at-school and not-at-school population has changed only marginally. The proportions for males and females are approximately the same. During recent decades, Fiji has achieved a high level of school attendance. However, during the intercensal period 1996-2007, school attendance at the primary level has slightly dropped but this applies to the Indians. This is mainly due to the fast fertility transition of Indians (resulting in a very narrow-based age-sex structure) as well as very significant emigration. Urban school attendance ratios are very marginally higher than the rural ones.

It is very satisfying that, at the primary level, there is very little difference between the numbers enrolled by the DOE and the numbers attending according to the 2007 Census, especially in the case of the Indians. This is further evidence that coverage during the 2007 census must have been reasonable.

The Gross Attendance Ratios at the primary level for all sub-categories of the population (derived from the census) exceed 100 percent. This implies that all classes at the primary level have significant numbers of “over-aged” children. This used to be mainly a problem for Fijian children but, since 1996, it has also become a larger problem for Indian children. Attempts to measure net attendance from the census were not very satisfactory due to the fact that the census does not provide the age at enrollment but the age at the time of the census. Users requiring a picture of net attendance are referred to the Net Enrollment Rates and Cohort Retention Rates of the Department of Education (DOE).

With regard to the level of attainment for those who have left school, the main feature is the significant increase in the proportion of persons that have completed tertiary education. Furthermore the proportion of children that continue from primary to secondary level has also increased significantly.

For indices of achievement, users are referred to the assessments carried out by the DOE. However, the census has attempted to measure adult literacy in an indirect manner by considering the proportions of people who have completed at least class 3. According to this measure, adult literacy was already high in 1996 and has further increased to levels of over 95

percent. Judging from experiences in other countries (i.e. Papua New Guinea), it is likely that a Literacy Survey, measuring reading, writing and understanding skills would rate the level of adult literacy at a significantly lower level. Change in the census criterium for literacy will have implications with regard to comparability with previous censuses and also with literacy in other countries that use the "completed at least class 3" cut-off point.

7. Religious affiliation

The collection of information regarding religion during a census is not ideal. Census information for all household members is usually given by one senior member of the household (often the head of household or his/her spouse). In the case of religion, this frequently leads to unintentional and sometimes deliberate response error. Since questions regarding religion are often considered as sensitive, census enumerators have been instructed to record without further questioning, the religion reported by the respondents even in cases where the response appears to be incorrect. (The same is the case with regard to marital status). Furthermore, the Census Act states that respondents are not obliged to answer the question on religion. So far, very few census respondents in Fiji have refused to answer the question on religious affiliation.

The landscape of religious affiliation in Fiji is regularly undergoing drastic and sudden changes, especially in the case of the Fijians. The information concerning change in religious affiliation since 1986 in Chapter VI is not always satisfactory, but more so for the Hindus and Moslems than for Christians. This is partly the result of the fact that the census code list on religion requires continuous updating. The FBoS is presently working on a next version of this code list.

A2. POPULATION PROCESSES

1. Mortality

Fiji's mortality transition probably started already in the 1920s but, until World War II, progress was moderate. During the 1950s, 1960s and 1970s, mortality decline was very fast. However, since the 1980s, the mortality transition seems to have stalled. The analysis of 1996 and 2007 Census data, as well as NHIS data suggests that adult mortality may even be on the increase again. This reversal of the trend is probably due to the same combination of factors already identified during the 1996 Census analysis.

- The political situation has led to economic stagnation and subsequently to a relative lack of improvement in health services (especially for adults), loss of jobs and income and related factors. It will be noted that the unemployment rate has increased very significantly after 1996.

- "Health drain" due to the fact that emigrants are, on average, healthier than those who stay behind. The entry requirements for the countries of destination of emigrants from Fiji favor young, educated and healthy persons.

- A drastic increase in lifestyle disease (cardio-vascular disease, cancer, diabetes etc.)

At the time of the 1986 census, infant and child mortality In Fiji had already reached a moderately low level. However, after that, relatively little progress has been made. In spite of reports that Fiji is on track with regard to the achievement of MDG 4, the available evidence clearly shows that this is not the case. The baseline for the MDGs is the year 1990 and virtually all progress in the early childhood (as well as adult) mortality transition has been made before and not after that year.

The average life expectancy at birth is not only a key index of mortality but also of the health situation and more generally of development in the country. The fact that this important index has stagnated, has a major impact on Fiji's ranking on the UN Human Development Index (HDI). Since change in the average life expectancy at birth is usually also closely correlated with change in the poverty situation, stagnation in average life expectancy probably means that progress with regard to MDG 1 (poverty) is not on track.

The era of indirect estimation of mortality from census data (which Fiji has practiced since the 1946 census) is coming to an end. Future analysis of mortality must rely on death registration data from the primary sources: the Civil Registration System and the National Health Information System. It is imperative that these data collection systems achieve a statistically acceptable standard of completeness and accuracy in the very near future.

The mortality transition in Fiji will be investigated in far more detail in a forthcoming Research Monograph to be published by the FBoS.

2. Fertility

The onset as well as the pace of the fertility transition for Fijians and Indians is very unequal. The Indian transition started relatively early (in the late 1950s) and progressed at a very fast rate. The Indians have now achieved replacement level. (The Net Reproduction Rate is less than 1.0).

The Fijian transition started relatively late (in the 1960s) and progressed at best at a rather moderate pace. Moreover, after the coups in 1987, the transition temporarily lost its momentum.

A forthcoming USP/UNFPA Census Research Monograph will provide additional information on the fertility situation and trend in Fiji. Furthermore, differential fertility, based on a comprehensive "own-children" analysis will be covered in a Research Paper by the FBoS. The 2007 Census provides a better base for differential fertility analysis since, compared to previous censuses, the proportions of children that has not been matched with the natural (own) mother has decreased very drastically.

3. Migration and urbanization

Chapter IX focuses on migration within the country: between provinces and between the geographic sectors (rural and urban). Fiji does not have a Continuous Population Register (CPR) that produces information on internal movements of the population on a continuous basis. Virtually all information on internal migration that is presently available has been collected during censuses. This implies that it becomes available only once every ten years. The early censuses since 1956 only provided very limited information on lifetime migration. Censuses since 1976 also provide information on recent migration. All these censuses were de-facto censuses. However, the 2007 census also recorded the usual place of residence at the time of the census of all respondents. Since migration refers to a change in the usual place of residence, the quality of the 2007 Census migration data is probably superior to that of previous censuses.

In the analysis of the 2007 Census data in Part A of Chapter IX, the same typology of migrants (non-migrants and four types of migrants) has been as used during the previous censuses. After establishing the migration status of all respondents, the analysis homes in on two categories of migrants viz. the lifetime and recent migrants. The volume and direction of lifetime as well as recent migration has not changed very much since 1996. Moreover migration of females continues to exceed that of males and migration of Fijians that of Indians. Most importantly, Naitasiri Province has maintained its prominent position as a province of in-migration. About 30 percent of all interprovincial migrants in Fiji end up in this province or more precisely in the newly incorporated town and urban area of Nasinu. All seven provinces of the Northern and Eastern Division continue to experience very significant out-migration. With regard to the Northern Division, this should be taken into account in future planning resulting from Fiji's "Look North" policy.

Chapter IX also provides the recent net-migration rates at the provincial level. These will amongst others be used for the formulation of the migration assumptions of provincial population projections in the near future.

The urbanization analysis in Part B of Chapter IX is based on the census-statistical urban areas defined in Chapter I. Unlike the incorporated cities and towns, the delineation of these urban areas is based on demographic/statistical criteria. All types of inter-sectoral migration are considered but the analysis focuses on the most important type: rural to urban migration. Once again, since 1996, relatively little has changed in the volume and direction of rural-urban migration. It is dominated by Fijians and most rural-urban migrants move to the two urban agglomerations, the Lami-Suva-Nasinu-Nausori corridor (more than 50 percent of all rural-urban migrants) and the Nadi-Lautoka corridor (about 25 percent of all rural-urban migrants). Chapter IX also introduces a further classification of the rural-urban migrants by "distance travelled".

Finally the urbanization level, trends and differentials as well as the demographic and socio-economic characteristics of the inter-sectoral migrants will be explored in more detail in a forthcoming USP/UNFPA Census Monograph.

A3. HOUSEHOLDS AND HOUSING

The 2007 Census of Population was once again combined with a Census of Housing. Since the 1986 Census, the amount of household and housing information that has been collected has increased drastically. In fact, the analysis in Chapter X covers only the tip of the iceberg. For far more detailed information, users are referred to the basic household and housing tables of the census. Moreover, after the 1996 Census, a very comprehensive analysis of the household and housing information was carried out and published in a Census Research Monograph. It is hoped that this will be repeated in the scheduled 2007 Census Research Monograph.

During the 1996-2007 intercensal period, all household and housing related indices have improved and some of them drastically. This refers to availability of electricity, safe water supply, modern toilet facilities, ownership of a large variety of household items etc. However, on average, the material situation of Indian households remains, in 2007, far better than that of Fijian households.

Generally, it is amazing to see that, in spite of the economic down-turn, ownership of essential and also not so essential household items has increased so much. It is unfortunate that this improvement in the material sense has not been accompanied by similar advancements in some other, more important areas like morbidity and mortality, the poverty situation etc.

B. RECOMMENDATIONS CONCERNING THE FIELD OPERATION AND PROCESSING OF FUTURE CENSUSES

1. Census preparations

1.1. Canvasser or householder approach

Until the 1996 census, the canvasser method was used throughout the country.[1] During the 2007 Census, the householder approach was introduced for the first time but only in a very limited number of high class enumeration areas (EA) in the Suva urban area.[2] The majority of the population was once again enumerated using the canvasser method.

The pilot survey preceding the 2007 Census, as well as the experiences during the field operation of the census itself has made it clear that self-enumeration remains challenging in Fiji. It seems that many households completing a self-filling questionnaire in 2007, did not bother to read the instructions, for instance those related to coverage rules as well as those related to several questions, especially the more problematic ones concerning the labour force, disability, remittances etc. Consequently, the average quality of the data for these EAs is less than that obtained by means of the canvasser method.

Furthermore, in the selected high class urban EAs; the householder method could not be used throughout. None of these EAs is entirely high class. They are only predominantly high class. The use of different forms during a census and especially the use of different forms in the same EA complicate the census field operation.

At some time in the future, Fiji will undoubtedly shift to the householder method. However, the available evidence suggests that, in the near future, the majority of the population needs to be enumerated using the canvasser method. The partial use of the householder approach during the 2007 Census was not a success. It complicated the field operation unnecessarily and the quality of the data obtained by means of this method is questionable. It is recommended not to repeat this experiment in the next census, unless a pretest/pilot test during the preparation phase of this census clearly indicates that the situation has improved very drastically.

[1] Enumerators completed an interview schedule for each household in their EA during a face-t0-face interview.
[2] In these EAs, enumerators delivered a self-filling questionnaire. Completing the questionnaire was the responsibility of the head of household.

1.2. Household or personal (individual) schedule

All censuses in Fiji so far used a household schedule.[3] Since the Census Users Advisory Committee insisted on increasing the number of questions to be included in the 2007 Census, the feasibility of changing to a personal (individual) schedule was considered.[4] The change from a household schedule to a personal schedule has major implications, not only for the field operation but also for data processing and analysis not to mention the cost of the census. After much discussion of the pros and cons, the FBoS decided to continue with the use of a household schedule.

- It was felt that the use of a personal schedule would place too great a burden on many enumerators, particularly the more marginal performers and those assigned to "difficult" areas.

- After the December 2006 coup, the census budget was reduced by 20 percent. The Census Office was forced to minimize costs as much as possible.

However, since all recommended additional questions were included on the 2007 Census household schedule, i.e. those concerning the labour force, disability, remittances and others, space on and the lay-out of the schedule became a problem, especially from the point of view of data processing.

During the preparation phase of the next census this issue will undoubtedly again be discussed in detail. This discussion should take into account the problems encountered during the field operation and processing of the 2007 Census and not make a change for the sake of change.

1.3.Factors to be considered in determining the contents of the interview schedule.

Users often do not realize that there is a limit to the number and nature of questions that can be included in a census. It must be reiterated that most census information is not obtained in a face-to-face interview with all household members but from a proxy respondent in the same household, in most cases the head of household or his/her spouse.

Some basic demographic and socio-economic questions will always be included in any modern census. Examples include age, sex, geographic level and sector and others. In Fiji, this includes also ethnicity. These questions are not only important in their own right but they are also cross-classified with virtually all other information that is collected in the census. Other questions that are included in virtually all censuses concern marital status, religion, school attendance and achievement, and basic question concerning the labour force. This has been the case in Fiji since

[3] On a household schedule the information for all members of the household, as well as all household information, is recorded on a one-page form. This form is usually very large and the front as well as back of this form is used.
[4] In the case of an individual schedule, the information for each individual in the household is recorded on a person specific form. In addition, a separate form is used for household level information. For instance, for a household consisting of 10 persons, there will be 10 individual forms and one household form.

1946. Other questions have gradually been added. The reason for their inclusion is that these topics had become important for policy makers and planners at the national and sub-national level.

During the preparation phase for the 2007 Census much attention was paid to the design of an interview schedule that is realistic in the case of Fiji. Of special interest were a number of questions that were not included in previous censuses but that were recommended for inclusion by the Users Advisory Committee. This process of arriving at rational decisions does not seem to have worked very well. In order to satisfy the express wishes of the Users Advisory Committee, certain questions and topics that are not very suitable for inclusion in a census have nevertheless been included. As expected, it appears that the quality of the data that has been collected with regard to these questions and topics is not very satisfactory. It is very strongly recommended that this experience is not repeated. If the Users Advisory Committee for the next census insists on the inclusion of new questions and topics, the FBoS should only act on this if a comprehensive pretest very clearly indicates that, considering the restrictions of a census, it is feasible and cost effective to collect reasonably accurate information. This should be made clear to members of the Users Advisory Committee.

Prior to the next census, the following issues should be considered concerning all questions proposed for inclusion on the census interview schedule. This applies in particular to additional questions, not included in previous censuses.

- Who wants the data and for what? All census data must be essential for national and sub-national policy making and planning. The collection of all census information must be in the public interest.

- What is the cost of obtaining this information in a census?

- Is it possible to obtain the answers to this question in a cheaper and easier way from another source? A good example is the collection of fertility and mortality data in a census by means of indirect questions. This information can be collected much easier and cheaper through the birth and death registration systems of the CRS and the NHIS.

- What is the expected level of completeness and accuracy of the response? There must be reasonable prospects that it is possible to obtain complete and accurate information. For instance, since it is already very difficult to collect reliable information on issues like income and remittances in a specialized survey, it cannot reasonably be expected that including these topics in a census will lead to better results.

- Is the information too complex or too sensitive for a census interview situation? A good example is the collection of information on disability and remittances from proxy respondents in a census. It is obviously far better to collect this sensitive information in a specialized survey based on a representative sample. The interviewers in this kind of survey should be specialized in the kind of information that is being collected.

More specifically, the inclusion of the following modules/questions in the next census should be reconsidered.

- Disability

  Several censuses in the region, including the 2007 Census in Fiji, have attempted to collect information on disability. Understandably, these attempts have not been very successful. It is unreasonable to expect quality information in cases where a census enumerator with no special knowledge of disability attempts to get information concerning disability of household members through a proxy respondent. This is not the case in some but in most census interviews. This entire module should preferably be cancelled and the information collected in a disability survey.

- Remittances

  Obtaining complete and reliable information on income (and this includes remittances) is already far from easy in a Household Income and Expenditure Survey (HIES) that uses specialized interviewers and a diary system covering a period of two weeks. This is a very far cry from the census interview situation. Collecting this kind of sensitive information in the 2007 Census has been a waste of resources and time. Once again, this entire module should preferably be cancelled.

- Labour force information

  All censuses should collect basic nation-wide information regarding the labour force, employment and unemployment. This information should be obtained from all respondents above a certain specified age (preferably the ICLS cut-off point age 15). The labour force section of the 2007 Census was more extensive than that of previous censuses. It has reached the maximum of what is feasible in a census and may even have gone beyond that point. In particular, it should be considered whether the additional questions required to measure unemployment according to the ILO definition is not more suitable for inclusion in one of Fiji's economic surveys, especially the Labour Force, Employment and Unemployment Surveys.

- Retrospective questions on fertility and mortality

  In the absence of complete and accurate information regarding fertility and mortality from the primary sources of this information, the Civil Registration System (CRS) and the National Health Information System (NHIS), the 2007 Census once again included the retrospective question from which fertility and mortality indices can be estimated indirectly. As mentioned, this approach towards data collection on fertility and mortality will probably soon come to an end. It is costly; takes up much space on the interview schedule that could be used for other purposes and collection of this information in a census and especially the analysis of the data are far from easy and straightforward. Moreover, knowledge regarding the indirect analysis of this data is fast disappearing; the more so since the population studies and demographic programmes of universities in the

region have dropped this from their curricula. Preferably, Fiji should from now onwards rely on the primary sources of this data. Since it is very unlikely that birth and death registration by the CRS will sufficiently improve in the near future, the onus will be on the NHIS. The question whether or not the next census should continue with including the indirect questions should be answered by the results of a comprehensive review of the CRS and especially the NHIS prior to the next census.

In conclusion, because of the census interview situation, high cost and other restrictions of a nation-wide census, census questions need to be straightforward and there is a limit to the number of questions that should be included. The objectives of a census should never be confused with those of a specialized survey.

Finally, demands for more and more information by international agencies are forever increasing. These requests should be honored as far as possible. However, national interests and requirements should always have the first priority.

2. Field operation

The 2007 Census employed a large number of area coordinators (AC). The ACs did not only receive intensive training concerning all aspects of a census field operation but they were also trained as quality controllers. The rationale behind this is that, as long as the Interview Schedules are in the field, it is feasible to return to a household to update information and correct information that is obviously incorrect or inconsistent. Once the forms have left the field, further editing of the data is dependent on computer programmes.

The AC approach performed well during the 2007 Census but not optimal. Further improvements in data quality at the moment it leaves the field can be made by a more rigorous selection and training of ACs with regard to quality control. Some of the ACs seem to have acted mainly as census managers/administrators and factotums in their district and spent little time on quality control.

3. Data Processing

Prior to the field operation, when the Interview Schedule had been finalized, the decision was made to scan the 2007 census data. If scanning works properly, it is obviously cost and time saving. Reality is that many developing countries that have converted to scanning of census data have come to the conclusion that a very large proportion of the census schedules could not be read by the scanner due to unclear writing, writing with the wrong kind of pen, exposure of the forms to water and dirt and many other factors. The easy and usual solution is to impute the information that cannot be scanned. However, the larger the proportion of the information that is imputed, the more biased the data becomes. The reason is that it is very unlikely that the census forms that could not be scanned are a representative sample of all the census forms. It is likely that a disproportionate number of the rejected forms come from difficult, relatively inaccessible

areas of the country and from households with socio-economic characteristics that are below the national average.

Processing of the 2007 Census information was very much affected by the scanning procedure that has been used. It seems that, in particular the quality of the data in the fertility/mortality module and the labour force module of the Interview Schedule has been affected. The 2007 Census Schedule was not developed with scanning in mind and it was far from ideal from the scanning point of view. Considering the quality of some of the scanned information, it was decided to re-enter the data in the conventional manner. Re-entering and re-editing has taken a very long time. The principle of timeliness of a census has been compromised by the processing procedure.

If scanning is again considered for the next census, the decision made should entirely be based on a comprehensive pilot test in which all aspects of the census that can be affected by scanning are properly evaluated.

C. FUTURE CENSUS-RELATED RESEARCH AGENDA OF THE FBoS

A preliminary list of census related research topics includes:

1. Continuous analysis of fertility and mortality based on birth and death registration data recorded by the NHIS

The 1996 Census analysis included a detailed analysis of fertility and mortality based on data concerning births and deaths over the period 1995-1997, recorded by the National Health Information System (NHIS). During the 2007 Census analysis it was attempted to repeat this analysis for the period 2006-2008. Unfortunately, with regard to fertility, this was not possible since the required data on births by age of mother and ethnicity for the period 2006-2008 was, and still is not available. Since from now onwards, knowledge of the mortality and fertility situation and trends in Fiji can most likely not be based anymore on indirect analysis of retrospective data that, at great cost, have been collected in a census, the seriousness of the unavailability of this data cannot be over-estimated. Improvement and timeliness of the fertility and mortality data base of the NHIS and a continuous analysis of this data should therefore get a first priority on the research agenda of the FBoS. If the NHIS data base does not improve in the very near future, the FBoS may be forced to continue with the indirect collection of this data from the next census. As mentioned, it is possible that this may not be feasible anymore.

2. Comprehensive analysis 2007 Census data by koro dina

At the special request of the 2007 Census Users Advisory Committee, the 2007 Census Interview Schedule included a question about the koro-dina (place of origin) of Fijians and Rotumans. In principle, it is therefore now possible to carry out a complete demographic and socio-economic analysis of the Fijian and Rotuman components of the population based on koro-dina. So far this goldmine of information has remained largely un-researched. Remedial action by the research team of the FBoS should be taken as soon as possible. The results should preferably be published in a Census Research Monograph.

3. A comprehensive differential fertility analysis

The 2007 Census Research Monograph on fertility should have included a comprehensive analysis of differential fertility for various labour force, education, religion, migration status and other sub-categories of women. Unfortunately this is not the case. The underlying research, mainly but not entirely based on the application of the own-children technique of fertility estimation, using the most recent lifetables derived from 2007 census and NHIS data for reverse-survival of females age 15 and over and children age 0-14, should be carried out as soon as

possible. The results should be made available to policy makers and planners, especially those involved in MCH and reproductive health policy making and planning.

4. A comprehensive analysis of demographic and socio-economic change in Naitasiri Tikina and its urban area Nasinu based on 2007 and 1996 Census data

In Chapter II it was concluded that, during the 1996-2007 intercensal period, 76 percent of the population growth in the Central Division occurred in Naitasiri Province. The growth in Naitasiri Province amounts to 55 percent of the total national growth. Growth is mainly due to very substantial in-migration from other provinces. Nevertheless, in 2007, the population of this province is still significantly smaller than that of the most populous province, Ba. Given continuation of present trends, this will change very soon. Since the growth rate of the population of Naitasiri (2.2 percent annually) is much faster than that of Ba (0.8 percent annually), Naitasiri is catching up very fast. Continuation of present rates implies that, 26 years after the 2007 Census (2033), Naitasiri will become the province with the largest population.

Growth in Naitasiri Province is almost entirely (more than 95 percent) due to growth in just one of its tikinas: Naitasiri Tikina. Furthermore, more than 50 percent of the total 1996-2007 intercensal growth of the entire country was due to growth in the urban sector of this tikina alone. This is the recently incorporated town and delineated urban area of Nasinu. Growth in this urban area is a continuation of the trend that started already during the 1986-1996 intercensal period (before Nasinu Town was incorporated and the area was still part of the peri-urban area of Suva). The urban area of Nasinu is also one of the few places in Fiji, which still experiences very significant growth of the Indian population. This urban area has now established itself as the growth center in the eastern part of Fiji. It is likely that in the foreseeable future most of the problems related to rapid urbanization will be concentrated here

Policy makers and planners in Naitasiri Province and in the urban area of Nasinu urgently require more detailed information about the demographic and socio-economic situation and trend in this tikina and urban area. A comprehensive analysis, based on census and other data should be carried out in the near future.

5. A comprehensive demographic and socio-economic analysis of the ethnic group Rotumans

The analysis of the data of all censuses in Fiji so far included a study by ethnicity. However, the analysis was limited to the main ethnic components, the Fijians and Indians. All other groups were lumped together in the unsatisfactory and meaningless rest-group “Others”. With regard to the ethnic group Rotumans, it is usually assumed that the demographic and socio-economic characteristics of the 80 % of Rotumans in Fiji residing outside Rotuma Island are more or less the same as those of the 20 % remaining on Rotuma Island. 2007 Census analysis has shown that this is not correct. However, a detailed demographic and socio-economic analysis based on census data of the ethnic group Rotumans has not yet been carried out.

6. A comprehensive analysis of the demographic and socio-economic characteristics of the population of Fiji by religion

Since administrative data concerning the religious affiliation of people in Fiji is very incomplete and controlled by a very large number of religious institutions, and a central body amalgamating all this data does not exist, this kind of study can presently only be based on census data. Judging from the regular requests for this data, this study would be very useful. The results should preferably be published in a Census Research Monograph.

7. The mortality situation and trend in Fiji. A study based on census and NHIS data

After the 2007 and 1996 Censuses a very comprehensive indirect analysis of the lifetime fertility and paternal and maternal orphanhood data collected during these censuses was carried out. The results (indicators of the mortality level, pattern and trend) were compared with those obtained directly from death registration data recorded by the NHIS. The Analytical Report of the 1996 Census and this Analytical Report of the 2007 Census contain only a fraction of the information that is available. In the case of fertility and migration, more comprehensive results based on census data were (and will be) published in Census Research Monographs. In the case of mortality, a Census Research Monograph has never been produced and the USP/UNFPA Monograph series does not include a monograph on mortality either. It is therefore recommended that a monograph on mortality be published in the FBoS Monograph series. Because of the rapidly disappearing knowledge concerning indirect mortality analysis, this monograph should include a detailed documentation of the various techniques that have been used in the analysis.

8. The Rural-Non-Village sector in Fiji.

Prior to the 2007 Census, the rural sector of Fiji was divided into two sub-sectors viz. the part which is traditional rural and the part that is dominated by economic activities which are not typically rural. The latter sub-sector was labeled the Rural Non-Agricultural (RNA) Sector. RNAs are areas located in the rural sector but they have un-rural characteristics, particularly with regard to their socio-economic but also their demographic structure. RNAs include government stations, resorts, large plantations, large work camps, mine sites, agriculture and forestry stations etc. For policy makers and planners, it is important that data collection systems, but especially censuses, provide separate information for this very important sub-sector. Moreover, all future surveys should use this sub-sector for stratification purposes in a more efficient manner than has been the case so far. In fact, so far, no separate information has been published for the RNA Sector. The research agenda of the FBoS should include attempts to improve the RNA Sector database.

9. A demographic and socio-economic analysis of the population in Non-Private Dwellings based on census data

Censuses collect data for persons residing in private dwelling (PD) as well as persons who are part of a “collective household” or institution. Examples of non-private dwellings (NPD) include corrective institutions, various health institutions, boarding schools, barracks, ships etc. These collective households cannot be considered as households in the true sense of the word and it is difficult to collect information about their residents in a face-to-face interview. The 2007 Census used a special and reduced questionnaire for the enumeration of the institutionalized persons in NPDs. Basically, for NPD residents, only information that is available from the official records of these institutions has been collected, using well defined coverage rules for each category of institutionalized persons. Censuses tend to report some very basic information regarding the NPD population (usually not more than numbers by sex and ethnicity). A more comprehensive analysis of the census data on institutionalized persons should be carried out, especially since the 2007 Census has spent much time, money and effort to collect this information.

APPENDICES

APPENDIX A: GEOGRAPHIC SUBDIVISIONS IN FIJI

The census is the only data source that collects basic demographic and socio-economic information for all persons within the scope of the census at a particular point in time (Census Night). It does not only provide this data for the entire country but also for all geographic subdivisions of the country, down to the lowest level. In Fiji, the lowest level is Enumeration Area (EA). In order to exploit this main advantage of a census optimally, all geographic areas in which the country is subdivided need to be delineated precisely.

Appendix A discusses the subdivision of Fiji into geographic units.

- Section 1 deals with geographic level. This is the hierarchical framework of geographic subdivisions in the country.
- Section 2 is concerned with geographic sectors especially the rural-urban division of the country
- Section 3 contains a brief introduction to the basic requirements of census mapping.
- Section 4 explains the geographic coding system that was introduced prior to the 1996 Census and also used in the 2007 Census.
- The final Section 5 briefly refers to the use of census EAs in the delineation of Fiji's constituencies.

1. Geographic level

1.1. Administrative subdivisions

Administratively, Fiji is subdivided into four divisions viz.

- Central Division
- Eastern Division
- Northern Division
- Western Division

Each division consists of a number of provinces. The total number of provinces is 14. In addition, for census purposes, Rotuma District is also considered as a province and classified under the Eastern Division.

The provinces are further subdivided into tikinas. There are two types of tikinas:

- Tikina makawa (old tikina)

The tikina makawa consists of a group of villages. In many cases, these tikinas have never clearly been delineated. Furthermore, knowledge concerning many tikina makawa boundaries has gradually disappeared, especially in the now heavily urbanized part of the Central Division. This makes the tikina makawa less suitable for census (as well as other data collection) purposes. The 1946 Census was the last one that published information at the tikina makawa level. Work on the identification of tikina makawa boundaries is still in progress. It also needs to be stressed that the tikina makawa is mainly of importance for the Fijian component of the population. With regard to the 2007 Census, the tikina makawa has once again become more important since this census has collected information on the koro dina of all Fijians.

- Tikina vou (new tikina):

The tikina vou consists of a number of tikina makawa. The boundaries of these new tikinas have been clearly identified on the map as well as on the ground. All censuses since 1966 have published information at the tikina vou or combined tikina level only. Presently, there are 86 tikina vou.

For the purposes of the 2007 Census analysis, it is important to note that Fiji's international boundary as well as its internal administrative boundaries (divisions, provinces and tikinas) have not been changed since the 1996 Census.

1.2. Statistical subdivisions

The FBoS has further subdivided the tikina vou into (statistical/census) enumeration areas (EA). The EA is not an administrative area but a purely statistical/census unit of convenience. This smallest spatial unit does not have any legal or administrative significance. The EAs make the geographical system flexible. It is possible to combine EAs to form any kind of larger area that is required for planning or research purposes. In other words, the EA can be considered as a building block. It is also the smallest unit for which census information is published.

From the point of view of optimal coverage, it is imperative that EAs are defined precisely on the map as well as on the ground. Their delineation is based on a set of criteria. These are:

i. The entire land area should be part of an EA. Areas that have never been inhabited, for instance because of adverse conditions, should still be included in an EA. This also applies to recent extensions of the foreshore of some urban areas. In this respect, it should be mentioned that EAs bordering the coast extend as far as the high water mark (HWM).

ii. EAs should have clear and unambiguous physical or manmade boundaries (i.e. rivers, creeks, roads, tracks etc.)

iii. The EA boundary should not cross any higher-level administrative or census (statistical) boundary. In other words, they should be the smallest blocks from which all higher-level geographic units can be built up.

iv. An EA should ideally constitute a census workload. This means that preferably the number of households in an EA should not exceed the workload of one enumerator.

Note As explained in Chapter I, all censuses in Fiji until 1996, employed the canvasser method throughout the country. In practice this means that information for all members of a particular household is collected by a census enumerator during a face-to-face interview with a senior member of the household (usually the head of household or his/her spouse). During the 2007 Census, the canvasser method was also the main method of data collection. This will undoubtedly remain so during censuses in the near future.[1] It is assumed that, under normal circumstances, an enumerator will be able to cover approximately 100 households during the period assigned for the enumeration. However, some of the large and not easily accessible EAs in the rural sector, particularly in the interior of Viti Levu, have significantly less than 100 households and the same applies to some of the large EAs in Lau and Lomaiviti Province where enumerators need to spend a disproportional amount of time in traveling between households in their EA.

v. Comparability of EAs over time should, if at all possible, be maintained

It will be clear that the above criteria are ideal criteria. In many cases, it is not possible to delineate an EA according to these ideal criteria. The delineation of the rural EAs constitutes far less problems than the delineation of the urban EAs. EA boundaries that are often particularly difficult to identify on the ground include:

- Boundaries through densely settled areas with a chaotic settlement pattern and a rapidly changing population. This is particularly the case in some squatter areas i.e. in the urban areas Nasinu and Suva.

- Boundaries through areas undergoing rapid modern-type development. In these areas, physical and manmade features are often completely obliterated and/or become unrecognizable.

- Special care should be taken whenever an EA boundary coincides entirely or partly with a higher-level boundary. In this respect, it will be noted that the most difficult EA boundaries in Fiji are usually those that (partly) coincide with a city or town boundary. City/town boundaries often do not follow easily recognizable physical or manmade features but the boundaries of lots. These are not shown on topographic maps, even those at a scale of 1:10,000. The lot boundaries are often notoriously difficult to locate on the ground, unless one has a detailed cadastral map of the area. It will also be realized that

[1] The 2007 Census employed for the first time the questionnaire approach but this was restricted to a very small number of urban EAs. It seems that the quality of the data for these EAs is relatively poor.

the FBoS cannot change these official city and town boundaries in order to facilitate data collection.

In preparation for the 2007 Census, many corrections to EA boundaries have been made. The reason(s) for these boundary corrections were one or more of the following:

- Fast increase in the number of households (and population) of several (mainly urban) EAs since 1996. As expected, this is especially the case in the Nasinu urban area. These EA's have been subdivided in order to create manageable workloads for the enumerators.

- Because of recent modern-type development, some 1996 EA boundaries were no longer identifiable on the ground.

- Changes in some higher-level boundaries after the 1996 Census, especially changes in the boundaries of some urban areas (i.e. Lautoka and Nadi). In many cases these new boundaries crossed EA (or building block) boundaries.

- The incorporation of new towns. Between the 1996 and 2007, the only town that has been incorporated is Nasinu Town.

- For some provinces, tikina makawa boundaries and EA boundaries have been reconciled. This is for instance the case in the entire Northern Division (Macuata, Cakaudrove and Bua Provinces). However, in most provinces, particularly those in the Central Division, it has so far not been possible to identify all tikina makawa boundaries.

Last but not least, although the FBoS attempts to ensure that EA boundaries never cross any official higher-level boundary (administrative, political, statistical or otherwise), statistical/planning areas created by some government departments for their own purposes (i.e. in the case of the districts used by the Health Department and the Police Department), have unfortunately not been built up of EAs established by the FBoS. In other words, their boundaries often cross EA boundaries. As a result, it is not possible to publish precise census information for these department specific areas.

1. Geographic sectors

As most countries, Fiji is also subdivided into geographic sectors. The main subdivisions are the rural and urban sector.

2.1 Urban sector and urban areas

2.1.1 Brief history

Countries differ greatly in their definition of what is considered as "urban". As explained in Chapter I, prior to the 1966 Census, the census/statistical boundaries of all urban areas in Fiji were for the first time officially delineated. Subsequently, before the 1976 Census, these urban

boundaries were reviewed. No urban boundary revision was carried out before the 1986 Census. During the twenty-year period between 1976 and 1996, very significant developments in the public and private sector occurred. These have affected the rural-urban divide very significantly. Consequently, the 1996 Census was preceded by a major revision of the urban boundaries. An Urban Boundary Revision Team (UBRT) carried out this revision. The terms of reference for this UBRT included:

- To establish a new theoretical framework (including the statistical criteria) for the delineation of urban areas Fiji.
- To review the urban boundaries established before the 1976 Census, using the new criteria
- To recommend changes in the boundaries of the urban areas, taking into account the developments that have taken place since 1976, as well as changes in the official city/town boundaries.
- If necessary, to create new urban areas based on the new criteria.

The 1996 UBRT recommended that the delineation of urban areas in Fiji should be based on five criteria. These criteria are:

(1) Urban attributes

(2) Economic activity

(3) Population size

(4) Association and contiguity

(5) Population density

Based on these criteria, the boundaries of all urban areas were delineated.

At the time of the 1996 Census, Fiji had eighteen urban areas. Eleven of these consisted of an incorporated (gazetted) city/town and a peri-urban area. These were the two cities Suva and Lautoka and the nine towns Lami, Nausori, Nadi, Ba, Tavua, Sigatoka, Labasa, Savusavu and Levuka.

2.1.2 Situation during the 2007 Census

During the 1996-2007 intercensal period, one additional place with urban characteristics has been incorporated, viz. the town of Nasinu.[2] Consequently, the total number of incorporated cities/towns during the 2007 Census was twelve. All these incorporated cities and towns are administratively (politically) subdivided into wards.

Furthermore, during the intercensal period, some town boundaries have been extended. This applies first of all to the town of Nadi. In spite of this extension, which was long overdue, Nadi still has a very conservative town boundary, which excludes all the "urban villages" located in the Nadi peri-urban area. Recently, the town boundary of Labasa has also slightly been extended to the west.

The remaining seven urban areas do not have an incorporated city/town. These are urban areas for census/statistical purposes only. This category includes the unincorporated townships Vatukoula, Rakiraki, Korovou, Navua, Pacific Harbour, Nabouwalu and Seaqaqa.

Finally, studies of rural-urban migration, urbanization, urban growth etc. should be based on the census/statistical urban areas and not on the official cities and towns. The reason is that the delineation of cities and towns is not based on statistical/demographic criteria. The analysis in Chapter IX, Migration and Urbanization, is entirely based on the census/statistical urban areas.

2.2. Rural sector

During the pre-1996 Census boundary revision, the rural sector was subdivided into two sub-sectors viz. the part which is traditional rural and the part that is dominated by economic activities which are not typically rural. The latter sub-sector was labeled the Rural Non-Agricultural (RNA) Sector. RNAs are areas located in the rural sector but they have un-rural characteristics, particularly with regard to their economic structure. RNAs include government stations, resorts, large plantations, large work camps, mine sites, agriculture and forestry stations etc. Unfortunately, it was not possible to introduce the RNA Sector before the 1996 Census.

A comprehensive report concerning all the changes made during this major revision can be found in the FBoS publication "The Rural-Urban Continuum in Fiji."

[2]Prior to the 1996 Census, plans for the incorporation of Navua and Rakiraki already existed. However, in 2007, Navua and Rakiraki still had the status of unincorporated township (or urban area for census/statistical purposes). After the 2007Census, Rakiraki has been incorporated.

3. Mapping

A crucial and time-consuming part of the preparations for a census concerns the updating of all census maps. For proper control over the entire field operation and for achieving optimal coverage, it is important that all census staff uses accurate, detailed and up to date maps.

Before the 2007 Census field operation, all enumerators were given a detailed map of their EA. Topographic as well as cadastral maps were used as base maps.

- For most rural EAs, the base map is a topographical map, scale 1:50,000.
- For most urban EA's, more detail is usually required. For these EAs, the base map is a topographical map, scale 1:25,000 or (if available) 1:10,000.
- Finally, in many EAs adjacent to a city or town boundary, a cadastral map showing individual lots is required. In Fiji, these maps have a scale as large as 1: 3,000. On a map of this scale, individual lot numbers are shown.

Moreover, in places that have seen rapid development in recent times, aerial photographs sometimes replaced out of date topographic maps or cadastral maps.

In order to achieve optimal coverage, enumerators were instructed to:

- Familiarize themselves completely with their EA and its boundaries on the map as well as on the ground.
- Meet with the enumerators of adjacent EAs and ensure that all common boundaries are properly identified and clarified. Uncertainty or misunderstanding between enumerators concerning the exact location of a boundary on the ground should immediately be reported to their supervisor and if necessary, the Area Coordinator (AC) and the Mapping Section of the Census Office in Suva.
- Update their EA map. All inhabited places in the EA should be marked on the map. Moreover, maps that were not entirely up to date have been adapted. For instance, inhabited places (quite often hidden or out of sight) that were not listed or shown or marked on the map were added. More generally, all new locality names that came to the attention of the enumerators were marked on the map. On the other hand, all houses and localities that have been abandoned since the map was produced were deleted. All map corrections were passed on to the Mapping Section of the FBoS in Suva.

Supervisors and ACs closely supervised the above activities of their enumerators.

It needs to be reiterated that a precise, up to date and detailed EA map helps to achieve optimal coverage during a census. On the other hand, the use of imprecise and out of date maps is often highly correlated with coverage problems during a census.

4. Geographic coding system

All EAs have a unique code consisting of nine digits viz.:

P	P	T	T	S	E	E	E	C

- Digits 1 and 2 (PP) identify the province
- Digits 3 and 4 (TT) identify the tikina vou (or combined) tikina
- Digit 5 (S) identifies the geographic sector. It also identifies the urban area in cases where there is more than one urban area in a particular tikina[3]
- Digits 6, 7 and 8 (E) identify the EA
- Digit 9 (C) identifies the category or type of EA.

The three digits that identify the EA (EEE) are used differently for the urban and rural (including the RNA) sector. The traditional rural sector is not further subdivided and the three digits are simply used to identify EAs within a tikina. This also applies to the RNA Sector. However, in the urban sector, codes have been allocated to subdivisions of the urban area viz. the city/town and the peri-urban area. Wards within a city/town also have a unique code.

5. Constituencies

The delineation of political constituencies (electorates) is not and should not be the responsibility of the FBoS. This is the responsibility of an officially appointed Electoral Boundaries Commission (EBC). However, this Commission cannot perform its tasks adequately unless it has access to complete and up to date information concerning the citizen population age 21 and over for the smallest statistical units, the EA. In other words, the EA should preferably also be the building block for constituencies. The only data collection system that is able to provide this EA level information is the census. Consequently, the EA level population data by age, sex and ethnicity collected during the 2007 Census has been used by the EBC to review the existing boundaries and to make changes if this was deemed necessary.

[3] In 2007, there are four tikina vou that contain more than one urban area or part of an urban area viz.:

- Suva Tikina (part of Suva and Lami
- Naitasiri Tikina (part of Suva, Nasinu and Nausori)
- Serua Tikina (Navua and part of Pacific Harbour)
- Tavua Tikina (Tavua and Vatukoula)

APPENDIX B: CENSUS COVERAGE

The most important objective of a census is that every person within the scope of the census is enumerated once and only once. If in the final assessment of the census, it appears that the quality of the collected data is good but that more than say ten percent of the population has not been included in the enumeration, the verdict will undoubtedly be that it was not a good census. Furthermore, it may not be assumed that the group of people that has not been covered by the census can be considered as a random selection of the population. It is likely, that during a census, persons residing in relatively inaccessible areas, persons with no fixed abode, persons living in areas that have a reputation of being dangerous etc. will be more under enumerated than others.

Although censuses in Fiji were never followed by a Post Enumeration Survey (PES) to establish the level of under-enumeration, it seems that coverage during censuses in Fiji has been reasonable. However, comparison of the population growth rate for the period 1966-1976 with the rates for the periods 1956-1966 and 1976-1986 suggests that in 1976, under-enumeration in several provinces may have been more extensive than in 1966 and 1986. Possible reasons for this include:

- The 1976 Census was the first one after Independence. Much of the staff involved in this census had no former experience with census taking.

- Although all boundaries of urban areas as well as the boundaries of the enumeration areas (EA) in these urban boundaries had been properly mapped, this was not the case for the rural EAs.

- After Independence, a very significant number of people moved to one of the urban areas.

This appendix is concerned with the measures undertaken by the FBoS to maximize coverage during the 2007 Census. In Section 1, it focuses on the preparation phase of this census and in Section 2 on the coverage rules used during the field operation.

1. Preparation phase

During the preparation phase of the 2007 Census, the following was done to ensure that coverage during the census would be optimal:

- Field staff was made thoroughly familiar with all administrative and statistical (census) boundaries and particularly the delineation of Enumeration Areas (EA) in their area. This does not only apply to the boundaries on the map but even more importantly, to the location of these boundaries on the ground. It needs to be stressed again that boundary problems often lead to coverage problems.

- It is sometimes difficult to enumerate the population of Non-Private Dwellings (NPD). Prior to the census, Area Coordinators (AC) were instructed to identify all NPDs in their area and to prepare for the enumeration of the institutionalized persons in these NPDs. These persons are considered as members of collective households. NPDs include:

    - Corrective institutions, such as prisons etc.
    - Health institutions, such as hospitals, health centers etc.
    - Boarding schools
    - Military barracks
    - Ships

- It is even more difficult to cover all homeless people during a census, particularly those in the large urban areas. Before the census, ACs were instructed to identify all places where homeless people sleep and eat. Special arrangements were made for their enumeration.

- Prior to the census, ACs also traced the locations inhabited by recent migrants. It will be noted that during the 1996 Census, the category recent migrants, particularly those from Asia, was probably more under-enumerated than any other group.

- AC's were involved in census awareness creating activities, particularly through participation in Tikina Council, Church and other meetings in their district.

2. Field operation

During the 2007 Census, very comprehensive coverage rules have been used. A detailed knowledge of and strict adherence to the census coverage rules by all census staff is essential. As explained in Chapter I, the 2007 Census has, like previous censuses, been conducted on a de-facto basis. This means that all persons present in the country on Census Night (midnight 16 September) were included in the census. The following sections detail the different measures that were taken to achieve optimal coverage.

1.1. Coverage rules

Census respondents were enumerated at the place (household) where they spent census night, irrespective of their usual place of residence. Moreover, the enumerator visited every household in his/her EA as soon as possible after census night and recorded the particulars required of every person staying with the household on Census Night. This included visitors staying with the household on census night. For census purposes they were considered to be part of the household and they were therefore enumerated with the household.

Furthermore, those persons belonging to the household who were temporarily absent on census night but returned to their household before twelve noon on the following day were included with their household. More precisely, this applies to the following categories of persons:

- Those working on a nightshift during census night but returning to their household the next morning. Examples are police officers, security guards, nurses and other health personnel etc.

- Those staying at the market during census night in order to be there at opening of business the next morning.

- Fishermen who were out fishing on census night but returned the next morning to their household.

- Passengers on board of ferries

- Passengers and others, staying on census night at an airport.

- ACs, supervisors and enumerators spending Census Night in their district/EA. These workers involved in the census field operation advised their household members that they should be included with their own household.

On the other hand, those household members traveling within the country at the time of the census were enumerated with the household where they stayed during census night and not with their own household! This also applies to persons who, at census night, stayed as a patient or inmate in a non-private dwelling (collective household) such as a hospital or prison etc.

2.2. Enumeration of institutionalized persons in NPDs

Some groups of people live together but not in a private dwelling (PD) but in a “collective household” or institution. These are referred to as non-private dwellings (NPD). These collective households cannot be considered as households in the true sense of the word. Census staff paid special attention to the enumeration of the institutionalized persons in these NPDs.

Prior to the field operation, the FBoS developed a special and reduced questionnaire, referred to as the Short Form for the enumeration of the institutionalized persons in these NPDs. For these respondents, only basic information that is available from the official records of these institutions has been collected. In other words, the information for these respondents was not collected during a face-to-face interview.

During the preparation phase of the census, ACs located all NPDs in their district. They met with the heads of these institutions and identified a suitable person to be appointed as census coordinator. One basic requirement was that this person should have access to the official records of the patients/inmates/students of the institution. The ACs briefed all census coordinators in the institutions with regards the enumeration of the persons living in collective households.

The actual enumeration of the population residing in all NPDs was the responsibility of the supervisors.

The coverage rules for the special categories living in NPDs were the same as during the 1996 Census. These are:

- Health institutions:

On the evening of census night, a stock of the special questionnaires was supplied to the census coordinators of these health institutions. These census coordinators entered the information requested for all patients staying in the health institution on census night, based on their official records for these patients. In other words, all these persons were treated as belonging to a single household. The completed questionnaires were collected the next morning. As in the case of hotels and motels, all doctors, nurses and other staff on a night shift during census night were not enumerated with the patients but with their own household.

- Corrective institutions

The Chief Warden appointed one of his officers as census coordinator. All inmates staying in a prison on census night were enumerated in the same way as those staying in health institutions. Moreover, as in the case of health institutions, staff of the prison such as wardens, guards etc. on night duty was enumerated with their own household and not with the inmates.

- Barracks

The Commanding Officer (CO) appointed one of his officers as census coordinator. On the day before census night, this coordinator was given a set of the special questionnaires. The coordinator entered the required information for all army staff living in barrack type accommodation, based on the army records. A census enumerator in a face-to-face interview enumerated army personnel living with their own household within the compound. Special care was taken that those on guard or other duty during census night were included.

- Boarding Schools

As in the case of the other institutions, the FBoS, in collaboration with the head of the boarding school, appointed a census coordinator. This coordinator entered all required information for children staying at boarding school during census night on the special questionnaires, based on the boarding school records. The completed questionnaires were collected the morning after census night.

- Ships

All persons on board a ship in Fiji's territorial waters during census night were considered as belonging to one single household. Special questionnaires were distributed to the shipping

agencies, which were responsible for their distribution. Ship captains entered all required information of the ship's crew on census night.

- If the ship was anchored in a harbor during census night, this "household" was considered as part of the EA in which the harbor is located. The supervisor for this area collected the completed questionnaires during the morning following census night.

- If the ship was in open water during census night but entered a harbor the next morning, it was considered as part of the EA in which the harbor is located. Once again, the supervisor for this area collected the completed questionnaires during the morning following census night.

- Special attention was paid to the enumeration of the crew of ships that were not in a harbor on census night and did not enter a harbor during the morning after census night but stayed in open water. This applied in particular to commercial fishing vessels. These ships were included in the most appropriate Enumeration Area (EA). Staff of the Census Office in Suva kept in touch with the relevant Shipping Agency and asked this Agency to report to the Census Office as soon as this ship entered a port within the Fiji group. Arrangements were then made for the collection of the completed forms.

Note: An exception was made for the passengers of large boats (ferries) which, on census night were on the way between different parts of the country. An example is the SOFI, which was on the way between Suva and Savusavu on census night. The captains of these ferries were not asked to complete the Short Form for their passengers. These passengers were enumerated with their own household.

In conclusion, during census training, much attention was given to the coverage rules for the institutionalized persons in NPDs and probably even more to a large variety of exceptional cases. However all the time spent on discussing the above exceptional cases was not a waste of time. During the sessions concerning coverage rules and its exceptions, the ground rules with regards coverage were constantly reinforced.

Finally, in spite of all the emphasis on exceptions, field staff was constantly reminded that the majority of the people in Fiji at census night in 2007 would be staying in a private dwelling that is in a normal household. Probably less than five percent was not staying in a private dwelling i.e. in one of the above categories of NPDs.

2.3. Enumeration of persons staying in hotels, motels and guesthouses

Persons staying at hotels, motels and guesthouses on census night were enumerated in the same way as the institutionalized persons in health institutions, corrective institutions etc. For the enumeration of these respondents, the following arrangements were made:

On the day before Census Night, that is 16 September 2007, the supervisor responsible for the area, visited all hotels, motels, boarding houses and backpackers' places in his/her area. The supervisor:

- Delivered the census instructions for the managers of these places

- Delivered a stock of Self-Filling Questionnaires and privacy envelopes. The manager was asked to give all citizens and residents of Fiji who stayed on census night in the hotel on census night a Self-Filling Questionnaire. These respondents were asked to return the completed questionnaire sealed in a privacy envelope the next morning.

- Advised the manager that he/she would return the next morning in order to:

    - Collect the completed self-filling questionnaires
    - Record the number of visitors from overseas who stayed in the hotel on census night, by sex.

The supervisor collected the privacy envelopes with completed questionnaires before midday after census night. It needs to be stressed again that hotel, motel or guesthouse staff on a night shift during census night were not enumerated with the guests but with their own household.

2.4. Absence of inhabitants and uninhabited dwellings

It sometimes happened that at the time an enumerator visited a household, he/she was not able to obtain any information, either because nobody was at home or no adult member of the household was present. In these cases, the following procedures were followed:

- The enumerator enquired either from the children present or from neighbors, what would be the best time to call back. If possible, they made an appointment for the return visit. If this was not possible, the enumerator sent word ahead when he/she would be visiting the household next.

- If after three visits, it was still impossible to enumerate the household members, a note was made of the place and the supervisor was notified.

- The supervisor made a last effort to collect whatever census information was available about the absent household members from family members or friends living nearby, neighbors or other proxy respondents. It should be stressed that this was the very last resort. Supervisors tried to establish whether the absent household members were possibly enumerated somewhere else in Fiji. For instance, household members may have been away on a holiday somewhere else in Fiji, visiting relatives, being away to participate in a choir competition etc. There are many possible reasons for their absence. If it could be established that the above was the case, it may be assumed that the missing people were covered at the place where they stayed on census night. However, if the above was not the case, supervisors tried to collect whatever information they could from these proxy respondents.

2.5. The homeless

There is one group of persons who pose particular problems during a census. These are persons who do not have a conventional roof over their heads; in other words, they do not have a fixed address and they can often not be linked to any household. In Fiji, the large urban EAs have a significant number of vagrants, persons sleeping in the streets, under bridges, in parks etc. This clearly is a borderline category. As long as their families consider them as part of the household, they will probably visit and stay with this household on a more or less regular basis. In that case, their household will most likely include them as household members. The real problematic persons from the point of a view of a census are those whom their family do not recognize (anymore) as household members. Unless enumerators make special arrangements for the enumeration of these people, it is likely that they will be left out. For many years, this category has been on the increase in Fiji, particularly in the major urban areas.

Enumerators liaised closely with their supervisor and AC concerning the enumeration of these people. In order to identify accommodation likely to cater for these homeless people, ACs contacted city/town councils and other local authorities. In Fiji, some churches also play a major role in catering for the homeless.

2.6. Last coverage checks and labeling

After finalizing the census interview and completion of the interview schedule and before leaving the household, the enumerator checked the interview schedule once again in order to make sure that it had been completed fully and correctly. Enumerators were reminded again and again that it is better to check their work on the spot than to have to go back or be sent back at a later stage after the supervisor and/or AC have pointed out that mistakes have been made.

At the end of the visit, the enumerator attached a self-adhesive label with the appropriate GPS or waypoint number at a place on the dwelling where it can easily be seen and where it is out of reach of small children. Enumerators ensured the household members that the three labels for the house, the census book and the gate are the same. The purpose of the label is to ensure that no household is enumerated twice and that none is missed. It also makes checking easier. Household members were asked to leave the labels in place during the period of the enumeration.

2.7. Self-reporting

Towards the end of the field operation, the Census Commissioner made an announcement via radio, TV and in the newspapers for people who believed that they had not been enumerated to contact the nearest Census Superintendent who then took appropriate action.

2.8. Tally of interview schedules, provisional summaries and mopping-up operation

- Interview schedule tally

Interview schedules were issued to enumerators in bound books of fifty forms. Census staff were instructed that under no circumstances a form should be taken out or destroyed. Enumerators had to account for all forms issued to them. Supervisors and ACs kept accurate records of the issued and returned books of forms.

- Provisional summaries at the EA level

At the end of each household interview, the enumerator completed the following summary table. This summary table was included at the bottom of the back page of each interview schedule:

Ethnicity	**Total. Pop.**			**Cit. Pop. 21+**		
	P	**M**	**F**	**P**	**M**	**F**
Total						
Fijians						
Indians						
Rotumans						
Others						

- Total population

  The total population (by sex and ethnicity) is required for census/statistical purposes. These figures are the basis for the computation of the provisional (hand count) figures for the total population and the population of the main geographic subdivisions.

- **Citizen** population age 21 and over

  Information concerning the **citizen** population of voting age (age 21 and over) for each of the EAs was used by the Electoral Boundary Commission to delineate the constituencies for the next elections. This means that the EAs will be the building blocks for the constituencies as well.

- Mopping-up operation

In the Census Office, the provisional count of the total number of enumerated persons for each EA was compared with the projected totals prepared in the office. In those cases where there appeared to be a significant discrepancy between the two counts and these could not be

explained i.e. because of an EA boundary change, migration etc., a mopping up operation was organized in these EAs.

2.9. Post Enumeration Survey

During the 2007 Census, a certain number of persons were undoubtedly not included and it is possible that some may have been enumerated more than once. The net effect is almost certainly some undercount in the census data. It may be expected that certain sections of the population will be more affected by under-enumeration than others. In most countries, there is differential under-enumeration by age and sex and particularly by ethnicity and by geographic subdivision and sector. In the case of Fiji, it is often assumed that under-enumeration in squatter areas is more extensive than in other places. Furthermore, the results from the 1996 Census suggest that the Asian population in Fiji has been significantly more under-enumerated than all other groups.

Under-enumeration does not only affect the total population counts but it can cause a bias in all census data, due to the fact that the characteristics of missed people will, on average, almost certainly be different from those who have been included in the census.

Some measure of the extent of under-enumeration can be obtained by means of a Post Enumeration Survey (PES). A PES is a sample survey of households carried out immediately after the Census. Unfortunately, due to operational and financial constraints, a PES has so far never been conducted in Fiji and this includes the 2007 Census.

APPENDIX C: TECHNICAL NOTES

In Appendix C, techniques utilized in some of the chapters of this Analytical Report are briefly explained and illustrated with data collected during the 2007 Census. This applies in particular to Chapter I, II and III. Direct and indirect techniques used in Chapters VII, VIII and IX, dealing with the demographic processes mortality, fertility and migration respectively are not always explained. Users unfamiliar with these techniques are advised to consult:

- With regard to mortality:
  - The Analytical Report of the 1996 Census
  - "The Indirect estimation of mortality from retrospective data collected in censuses and surveys". A handbook prepared for members of the FBoS Analytical Team for the 2007 Census.[4]
  - "The Mortality Transition in Fiji. A study based on an analysis of census and death registration data since 1881". 2007 Census Research Monograph Nr. 1 of the Fiji Bureau of Statistics, FBoS, Suva, Fiji.[5]
- With regard to fertility:
  - The Analytical Report of the 1996 Census
  - The USP/UNFPA 2007 Census Research Monograph on fertility.[6]
- With regard to interprovincial migration
  - The Analytical Report of the 1996 Census
  - "Internal migration. A study of the level, direction and characteristics of inter-provincial migration based on census data", 1996 Census Research Monograph Nr. 1 of the FBoS.[7]
- With regard to urbanization
  - The Analytical Report of the 1996 Census
  - The USP/UNFPA 2007 Census Research Monograph on urbanization.[8]

[4]Bakker, M.L.,2011b
[5] Bakker, M.L.,2013 (forthcoming)
[6]Gubadju, 2013 (forthcoming)
[7] Bakker, 2000
[8] Seniloli, 2013 (forthcoming)

1. Exponential growth

The exponential growth formula is:

$$\mathbf{P_2 = P_1 e^{rn}}$$

- P_1 and P_2 denote the size of the population at two points in time (i.e. the population of Fiji at the time of the 1996 and 2007 censuses)
- r is the average annual rate of growth of the population during the interval between the two censuses
- n (years) is the length of the intercensal period
- e is the base of the natural (Naperian) logarithm system.

Demographic applications of the exponential growth formula include:

- The computation of the average annual rate of growth (r) of a population between two points in time
- The computation of the doubling (tripling, quadrupling) time (d), corresponding with a given rate of growth
- Simple population projections (P_2) either into the future or into the past, starting from a given base population (P_1).

These three applications are illustrated in the following sections. The total population of Fiji in 1996 and 2007 is used in the examples.

1.1. Computation of the average annual rate of growth (r)

The total number of persons enumerated during the 1996 and 2007 censuses of Fiji was 775,077 and 837,271 respectively. Census night in 1996 was 25 August and in 2007 was 16 September. The calculation involves the following six steps:

- Step 1: This involves the calculation of the precise interval between the two censuses (n). In this case, the interval is between 11 and 12 years but quite close to 11 years. The interval between 25 August 1996 and 25 August 2007 is eleven years. Furthermore, the number of days between 25 August 2007 and 16 September 2007 is 22 days. This is 22/365 = 0.060 of a complete year. The intercensal period is therefore 11.060 years.
- Step 2: The formula $P_2 = P_1 e^{rn}$ is rewritten as:

$$\mathbf{P_2 / P_1 = e^{rn}}$$

The ratio P_2 / P_1 can be considered as a growth ratio. In our example:

$$\mathbf{P_2 / P_1 = 837,271/775,077 = 1.08024.}$$

Consequently

$$\mathbf{e^{rn} = 1.08024.}$$

- Step 3: The natural logarithm is taken on both sides of the equation:

$$\mathbf{\ln 1.08024 = \ln e^{rn}}$$

- Step 4: $\ln e^{rn} = rn \ln e$. In our example:

$$\mathbf{\ln 1.08024 = rn \ln e}$$

- Step 5: The natural logarithm of e (ln e) is equal to 1. In our example:

$$\mathbf{\ln 1.08024 = rn}$$

- Step 6: r is calculated from the above equation:

$$\mathbf{r = \ln 1.08024/n}$$

Since in our example, the intercensal period (1996-2007) is 11.060 years the above equation becomes:

$$\mathbf{r = \ln 1.08024/11.060}$$

ln 1.08024 = 0.07718. Consequently:

$$\mathbf{r = 0.07718/11.060 = 0.00698}$$

In the exponential growth formula, the annual rate of growth is expressed per unit. Most users express growth in percentage. In our example, the average intercensal rate of growth of the population of Fiji between 1996 and 2007 is 0.698 % (rounded 0.7 %).[9]

[9] For the calculation of doubling time, the following rule of thumb can also be used but r needs to be expressed in percent:

$$\mathbf{d = 70/r}$$

In our example, r = 0.698 percent. According to the rule of thumb:

$$\mathbf{d = 70 / 0.698 = 100 \text{ years}}$$

This rule of thumb can only be used for the computation of the doubling time.

1.2. Computation of the doubling time (d) corresponding with a given rate of growth.

In this section, it is assumed that, after the 2007 Census, the population continues to grow at the same annual rate of 0.698 percent as during the 1996-2007 intercensal period. Given this "no-change" scenario, how many years will it take for the population to double in size? In other words: given this "no-change" scenario, how many years will it take for Fiji's population to double in size (from 837,271 in 2007 to 1,674,542).

In order to find the answer, the exponential growth formula is again used. However, in this formula, n (length of intercensal period) is now replaced by the unknown d (doubling time):

$$\mathbf{P_2 = P_1 e^{rd}}$$

- Step 1: The formula is rewritten as:

$$\mathbf{P_2 / P_1 = e^{rd}}$$

- Step 2: If the population doubles in size, the growth ratio $P_2 / P_1 = 2$. In our example we get:

$$\mathbf{2 = e^{rd}}$$

- Step 3: The natural logarithm is again taken on both sides of the equation. This gives:

$$\mathbf{\ln 2 = \ln e^{rd}}$$

  Or:

$$\mathbf{\ln 2 = rd}$$

- Step 4: The doubling time (d) can now be calculated from:

$$\mathbf{d = (\ln 2)]/r}$$

  Since ln 2 = 0.69315,

$$\mathbf{d = 0.69315/r}$$

  When the exponential growth formula is used, r should however be expressed per unit. In other words:

$$\mathbf{d = 0.69315 / 0.00698 = 99 \text{ years.}}$$

In sum, our "no-change" scenario will lead to a doubling of the population of Fiji by the year 2106. (99 years after the 2007 census).[10]

Note: Exactly the same procedure is followed when we want to know how many years it will take for the population to reach x times the size of what it was in 2007, assuming "no-change" conditions.

- The exponential growth formula becomes:

$$\mathbf{P_2 = P_1 e^{rx}}$$

Or:

$$\mathbf{P_2 / P_1 = e^{rx}}$$

- Taking the natural logarithm on both sides of the equation gives:

$$\mathbf{\ln P_2 / P_1 = \ln e^{rx}}$$

This can be written as:

$$\mathbf{\ln P_2 / P_1 = rx}$$

Or:

$$\mathbf{x = (\ln P_2 / P_1)/r}$$

- If we want to know how long it will take to reach ten times the 2007 population , $P_2 / P_1 = 10$. The formula becomes:

$$\mathbf{x = (\ln 10)/r}$$

ln 10 = 2.30259 and r in our example = 0.00698. Therefore:

$$\mathbf{x = 2.30259/0.00698 = 330 \text{ years.}}$$

Consequently, given our "no-change" scenario', the population of Fiji will reach ten times its 2007 size, that is a size of 8,372,710 persons by the year 2,337.

1.3. Simple population projections

This section is concerned with simple population projections based on a "no-change" scenario. In the example, the population of Fiji is projected forward over a period of 25 years. The base population (P_1) is the 2007 census population of 837,271 persons. What will be the size of this population in the year 2032 if it is unrealistically assumed that that the fertility, mortality and migration conditions of the population will remain unchanged during the period between 2007 to 2032, resulting in an annual rate of growth (r) of 0.698 percent.[11]

- Step 1: Take the natural logarithm at both sides of the equation $P_2 = P_1 e^{rn}$. The formula becomes:

$$\mathbf{\ln P_2 = \ln P_1 + \ln e^{rn}}$$

  This equation can again be rewritten as:

$$\mathbf{\ln P_2 = \ln P_1 + rx}$$

- Step 2: The base population in 2007, P_1 = and ln 837,271 = 13.63790. Consequently, since n = 25:

$$\mathbf{\ln P_2 = 13.63790 + (0.00698 \times 25)}$$

  Or:

$$\mathbf{\ln P_2 = 13.63790 + 0.20071 = 13.81236}$$

- Step 3: In order to calculate P_2, take the antilogarithm of 13.81236.[12]

$$\mathbf{P_2 = e^{13.81236} = 996{,}854 \text{ persons}}$$

  Given a "no-change" scenario' with a fixed annual rate of growth of 0.698 percent, the population of Fiji in 2032 (25 years after 2007) will be 996,854 persons.

[11] In the calculations, the annual rate of growth is again expressed per unit (0.00698).

[12] For this, the function key e^x on a calculator can be used.

2. Accuracy of age reporting[13]

In this Analytical Report, two indices of accuracy of age reporting have been used viz.

- Myers' Index
- United Nations Secretariat Index.

The computational procedure for these two indices is illustrated in the following two tables 2.1 and 2.2 using data on the population by age and sex collected during the 2007 Census of Fiji.

2.1. Myers' Index[14]

Table 2.1a: Computational procedure for Myers' Index using 2007 census data for the total population of Fiji in single years

Term. Digit	Nr. at ages [as indicated]					Sum Ages	Sum Ages
	13-22	23-32	33-42	43-52	53-62	13-52	23-62
3	17,083	16,572	11,938	11,661	7,821	57,254	47,992
4	16,599	15,788	11,517	10,761	7,403	54,665	45,469
5	17,279	15,942	11,519	10,960	7,754	55,700	46,175
6	16,568	14,882	10,992	10,379	5,925	52,821	42,178
7	16,200	15,410	11,855	10,426	6,126	53,891	43,817
8	14,516	14,069	11,626	9,582	5,457	49,793	40,734
9	14,955	13,186	10,561	8,978	5,895	47,680	38,620
0	15,918	15,812	11,145	9,127	5,702	52,002	41,786
1	15,931	12,103	11,115	8,009	4,934	47,158	36,161
2	16,151	12,177	11,593	7,647	4,773	47,568	36,190
Sum	**161,200**	**145,941**	**113,861**	**97,530**	**61,790**	**518,532**	**419,122**

Term. Digit	Age 13 – 52			Ages 23 – 62			'Blended' Sum[+]	% Distr	Diff. 10%
	Sum	M[$]	Product	Sum	M[$]	Product			
3	57,254	1	57,254	47,992	9	431,928	489,182	10.3	0.3
4	54,665	2	109,330	45,469	8	363,752	473,082	10.0	0.0
5	55,700	3	167,100	46,175	7	323,225	490,325	10.3	0.3
6	52,821	4	211,284	42,178	6	253,068	464,352	9.8	0.2
7	53,891	5	269,455	43,817	5	219,085	488,540	10.3	0.3
8	49,793	6	298,758	40,734	4	162,936	461,694	9.7	0.3
9	47,680	7	333,760	38,620	3	115,860	449,620	9.5	0.5
0	52,002	8	416,016	41,786	2	83,572	499,588	10.5	0.5
1	47,158	9	424,422	36,161	1	36,161	460,583	9.7	0.3
2	47,568	10	475,680	36,190	0	0	475,680	10.0	0.0
Sum							**4,752,646**	**100.1**	**2.7[@]**

Note: [$] M = multiplier.

[13] Methods for the measurement of the accuracy of age reporting are explained in detail in United Nations Manual II. (Methods of Appraisal of Quality of Basic Data for Population Estimates, Population Studies, No. 23, Department of Economic and Social Affairs, Population Branch, UN, New York, 1955).

[14] The age range that has been in this section is the internationally recommended age range 13 - 62 and not the age range which is used in UN Manual II (United Nations, 1955).

Table 2.1b: Myers' indices for the Fijian and Indian population by sex at the national and provincial level derived from 1986, 1996 and 2007 Census data

Province	Sex	Myers' Index Fijians in the year:			Myers' Index Indians in the year:		
		1986	1996	2007	1986	1996	2007
Fiji	**M**	**2.4**	**1.8**	**3.6**	**2.7**	**2.8**	**3.1**
	F	**3.4**	**1.8**	**2.5**	**3.4**	**3.1**	**2.0**
Provinces in the Western Division							
Ba	**M**	3.1	1.9	4.2	3.3	2.6	2.6
	F	3.8	2.0	3.1	3.0	2.4	1.5
Nadroga	**M**	3.8	3.0	5.9	2.4	2.4	4.1
	F	2.4	4.1	3.2	5.8	2.4	3.8
Ra	**M**	3.9	4.4	6.8	5.1	7.0	6.1
	F	5.4	5.3	3.2	5.2	5.6	5.2
Provinces in the Central Division							
Naitasiri	**M**	4.0	2.9	3.5	3.1	2.9	3.8
	F	3.5	1.9	3.1	4.2	2.5	3.4
Rewa	**M**	3.5	3.5	4.0	4.0	3.9	4.7
	F	2.6	2.6	2.3	2.9	3.0	4.3
Tailevu	**M**	5.1	3.1	5.4	5.2	5.6	5.8
	F	3.3	2.9	6.1	5.4	2.6	8.9
Namosi	**M**	7.4	5.5	11.6	-	-	-
	F	10.9	6.1	5.3	-	-	-
Serua	**M**	4.9	5.6	4.4	5.0	5.6	6.9
	F	9.0	4.6	5.1	3.7	7.8	5.1
Provinces in the Northern Division							
Bua	**M**	3.5	3.3	5.6	-	-	-
	F	6.0	4.7	3.0	-	-	-
Cakaudrove	**M**	1.8	3.4	4.7	6.2	9.1	4.7
	F	3.0	4.1	2.8	7.1	11.2	7.7
Macuata	**M**	5.5	1.9	4.2	3.1	2.9	4.9
	F	4.0	3.8	5.5	5.2	3.1	5.3
Provinces in the Eastern Division							
Kadavu	**M**	4.9	5.4	5.4	-	-	-
	F	5.2	9.3	6.0	-	-	-
Lau	**M**	3.8	5.4	9.5	-	-	-
	F	7.2	5.4	13.7	-	-	-
Lomaiviti	**M**	5.5	4.4	3.9	-	-	-
	F	4.4	3.3	7.0	-	-	-
Rotuma	**M**	11.2*	15.3*	10.1*	11.2#	13.4#	6.1#
	F	12.3*	9.8*	12.7*	12.3#	9.1#	6.6#

Notes: * Population of Rotuma District (all ethnic groups)

Ethnic group of Rotumans in Fiji

Myers' Index is the sum of the values in the last column of the bottom part of the table (irrespective of sign). For this population, Myers' Index has reached the low value of 2.7. (The range of Myers' Index is from 0 to 180). This suggests that the age reporting during censuses in Fiji has reached a high level of accuracy. There is relatively little preference or dislike for any of the terminal (unit) digits. Furthermore, the minimum percentage of the enumerated people who reported their age with an inaccurate terminal digit is 1.4 percent. ('Myers' Index divided by two). 50.5 percent of this population reported an age ending on the digits 0 - 4 and 49.5 percent an age ending on the digits 5 - 9. Bachi's procedure leads to the same result.[15]Table 2.1b presents an overview of all Myers' indices at the national and provincial level for Fijians and Indians by sex, derived from the 1986, 1996 and 2007 Censuses.

2.2. U.N. Secretariat Index[16]

Table 2.2: Computational procedure for the UN Secretariat Index using 2007 census data for the total population in five-year age groups and by sex. *

Age Group	Analysis Sex Ratio		Analysis Age Ratio Males		Analysis Age Ratio Females	
	Ratio	Succ. Diff	Ratio	Diff. 100	Ratio	Diff. 100
0-4	107.4	-	-	-	-	-
5-9	107.6	0.2	94.9	5.1	94.1	5.9
10-14	105.9	1.7	104.3	4.3	104.9	4.9
15-19	105.5	0.4	97.5	2.5	97.9	2.1
20-24	105.9	0.4	105.7	5.7	104.4	4.4
25-29	103.6	2.3	100.8	0.8	103.5	3.5
30-34	106.9	3.3	99.2	0.8	96.2	3.8
35-39	103.6	3.3	93.7	6.3	95.1	4.9
40-44	103.3	0.3	104.7	4.7	105.9	5.9
45-49	105.5	2.2	105.9	5.9	103.2	3.2
50-54	102.1	3.4	97.3	2.7	99.2	0.8
55-59	102.0	0.1	97.8	2.2	96.5	3.5
60-64	98.2	3.8	100.3	0.3	100.8	0.8
65-69	93.0	5.2	97.2	2.8	99.2	0.8
70-74	-	-	-	-	-	-
Total [+]	**-**	**26.6**	**-**	**44.1**	**-**	**44.5**
Av.= Tot/13[$]		**2.1**		**3.4**		**3.4**
Index = [3 x 2.1] + 3.4 + 3.4 = 13.1						

Notes: [+] This is the sum of the values in these columns irrespective of sign.
[$]The average in this row is the sum of the 'successive differences' and 'deviations from 100' divided by the number of terms, in this case 13.

[15] United Nations, 1955

[16] The age range for which the age ratios have been calculated is 0 - 74. The sex ratios have been calculated for the age range 0 - 69. These age ranges are preferable to the ones used in UN Manual II.

3. Computation of the Median Age (Me) from grouped data

The computation of the Median Age is illustrated below, using 2007 census data for the total population of Fiji in five-year age groups. The total population in 2007 was 837,271 persons. If it was possible to 'line-up' these 837,271 persons, in order of increasing age, the age of the person standing exactly in the middle would have the median age of this population since 50 percent of the population would be younger and 50 percent would be older than this person. In practice, this method is of course not feasible. However, the computer can 'line-up' all persons with increasing age. The median ages in this Analytical Report referring to Census year 2007 have been computer generated. Unfortunately, this procedure cannot be used anymore for data from censuses before the 1996 census. The computational procedure explained in this section has therefore been used for the calculation of the median ages from Censuses between 1946 and 1986.

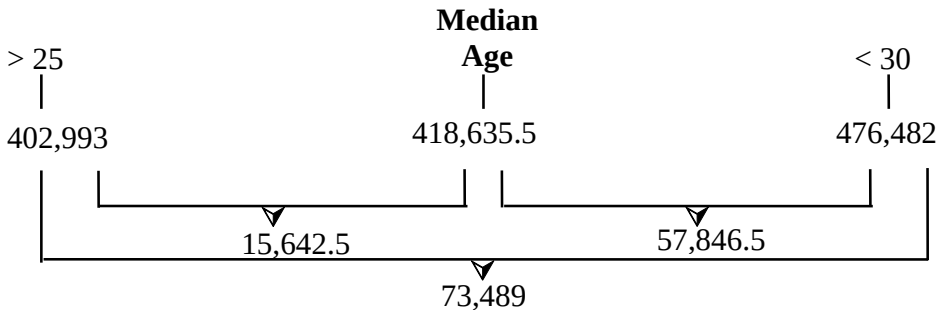
- Step 1: The 2007 Census age composition of the population under age 30 (in five-year age groups) is as follows:

Age Group	Number
0 – 4	82,717
5 – 9	78,017
10 – 14	82,381
15 – 19	79,518
20 – 24	80,360
25 – 29	73,489

This is converted into a cumulative age distribution:

Age less than	Number
5	82,717
10	160,734
15	243,115
20	322,633
25	402,993
30	476,482

- Step 2: If the total population of 837,271 persons is lined up the persons in the middle are nr. 418,635 and nr 418,636. According to the cumulative distribution, the age of these persons must be more than 25, but less than 30. An approximation of the age of this person can be obtained by means of interpolation:



The difference between 476,482 and 402,993 is 73,489. Furthermore the difference between 418,635.5 and 402,993 is 15,642.5 and between 476,482 and 418,635.5 is 57,846.5

Fraction 1 is therefore 15,642.5 ÷ 73,489 = 0.21285 and fraction 2 is 57,846.5 ÷ 73,489 = 0.78715. The two fractions should and do add up to 1.

- Step 3: The Median Age is now calculated by means of interpolation:

(0.21285 x 30) + (0.78715 x 25) = 6.38565 + 19.67863 = 26.06427 (Rounded 26.1 years)

4. Computation of the Singulate Mean Age at First Marriage [SMAM]

The Singulate Mean Age at First Marriage (SMAM) is defined as the mean age at first marriage among those who ever marry (before age 50). It is calculated from proportions never married (single) in five-year age-groups. The method was developed by Hajnal. [17]

The computational procedure using data on 'Never Married' males and females in Fiji as reported during the 2007 census, is given in Table 4.1. The calculations in this table are based on a hypothetical cohort of one person.

Table 4.1: Computational procedure of the 'Singulate Mean Age at Marriage' using proportions never married males and females from the 2007 census

i	Age Group (i)	Males			Females		
		Number *	Never Married		Number *	Never Married	
			Nr	Prop. U[i]		Nr	Prop. U[i]
1	**10 – 14**	-	-	-	-	-	-
2	**15 – 19**	40,820	39,759	0.9740	38,698	35,408	0.9150
3	**20 – 24**	41,323	34,486	0.8346	39,037	22,171	0.5680
4	**25 – 29**	37,388	18,122	0.4847	36,101	9,311	0.2579
5	**30 – 34**	32,827	8,279	0.2522	30,720	4,822	0.1570
6	**35 – 39**	28,778	4,199	0.1459	27,775	2,727	0.0982
7	**40 – 44**	28,597	2,515	0.0880	27,678	1,937	0.0700
8	**45 – 49**	25,839	1,934	0.0749	24,486	1,501	0.0613
9	**50 – 54**	20,215	1,394	[0.0690]	19,792	1,144	[0.0578]
–	**Total** +	-	-	**2.8543**			**2.1274**
	RS_1	5 x	2.8543 =	14.2715	5 x	2.1274 =	10.6370
	RS_2	14.6185 +	15.0 =	29.2715	10.6370 +	15.0 =	25.6370
	RN	[0.0749 + 2	0.0690] =	0.07195	[0.0613 + 2	0.0578] =	0.05955
	RM	1.0-	0.07195 =	0.92805	1.0 -	0.0597 =	0.94045
	RS_3	50 x	0.07195 =	3.5975	50 x	0.05955 =	2.9775
	SMAM	[29.2715 - 3.5975] / 0.92805 =		**27.7 yrs**	[25.6370 - 2.9775] / 0.94045 =		**24.1 yrs**

Notes: * Total number minus those whose marital status is Not Stated. Not Stated cases have been edited at a later stage.

+ This is the total for i = 1 to 8 (RS_1). If all persons under age 15 are unmarried, as in this example, the total is for i = 2 to 8.

[17] UN Manual X, 1983:225 - 229.

- Step 1: Calculation RS_1: The proportion never married, U(i) for i = 1 to 8 are added up. If no marriage takes places before age 15, U(i) for i = 2 to 8 is taken. The sum is the total number of person-years, the unmarried males/females have lived in the unmarried state between age 10 (or 15) and 50.

- Step 2: $\mathbf{RS_1 = 5 \sum U\ (i)}$ for i = 1 to 8 (See table note $^{+}$)

- Step 3: Calculation RS_2: 10 (or 15) years are added to RS_1. 10 (or 15) is the number of person-years lived in the single state from birth to age 10 (or 15) by the hypothetical cohort of one. RS_2 is therefore the total number of person- years lived between age 0 and 50 lived in the unmarried state by the hypothetical cohort of one.

$$\mathbf{RS_2 = RS_1 + 10.0}$$

Note: If no marriage before age 15 as in this example:

$$\mathbf{RS_2 = RS_1 + 15.0}$$

- Step 4: Calculation RN: This is an approximation of the average proportion unmarried males/females which remain unmarried. (This proportion, multiplied by 50, is the number of years lived by the hypothetical cohort of those who did not marry before age 50).

$$\mathbf{RN = \{U\ (8) + U\ (9)\} \div 2}$$

- Step 5: Calculation RM: The complement of RN = (1 – RN). This is the proportion of the hypothetical cohort of one that ever married.

$$\mathbf{RM = 1.0 - RN}$$

- Step 6: Calculation RS3. RS3 is defined as 50 RN. This the number of person-years lived between birth and age 50 by the proportion not marrying:

$$\mathbf{RS_3 = 50RM}$$

- Step 7: Calculation SMAM. SMAM can be defined as (RS2 - RS3)/RM. This the average number of years spent in the never married state by those who marry before age 50.[18]

$$\mathbf{SMAM = (RS_2 - RS_3) \div RM}$$

[18] It will be noted that SMAM is not the average age at marriage in a certain year. The marriages took place in the past.

5. The "own-children" technique of fertility estimation[19]

The "own children" technique was initially developed to measure differences in the level and pattern of fertility for subgroups of the population in the United States.[20] It has now become an important tool for the study of fertility levels, trends and differentials based on census (survey) data in developing countries.[21] The technique depends on the fact that in most societies young children live in the same household as their own (natural) mother.

5.1. Data requirements

The application of this technique requires the availability of:

- An 'own children' matrix. This matrix is a census/survey tabulation of children by age in single years (until age 9 or 14), cross-classified by age of their own or natural mother. In order to be able to produce this matrix, these young children must, during the census/survey, be matched with their natural or own mother.

- Lifetables by sex for the period prior to the census/survey. The survival ratios of these lifetables are used for 'reverse-surviving' the children and their mothers.[22]

It is important to note that, in principle, the application of this technique does not require any additional census/survey question. It provides a wealth of information on fertility with very little extra cost to the census/survey operation.

5.2 Matching of young children and their own mothers

During a census/survey, there are two possibilities of matching young children with their own mother viz.:

- Indirect matching: Use of relationship code (to head of household) on the Interview Schedule.

  In most Asian censuses/surveys where the "own-children" technique has been applied, mothers and their own children have been linked using this relationship code. This is feasible since in these countries, "the relationship of young children to the head of the family tends to be clearly defined. Consequently, there are usually not too many problems in relating 'own children' to their mothers on the census or survey schedule". [23]

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[19] Although the "own-children" technique has not been used in this Analytical Report, it will be used in a forthcoming study on differential fertility by the FBoS.

[20] Grabill and Cho, 1965. See also: Cho, Grabill and Bogue, 1971

[21] This technique is discussed in UN Manual X, 1983, pp. 182 - 196. See also Cho, 1973, pp. 263 - 280.

[22] In the case of Fiji, these lifetables have, since the 1986 Census, been estimated from the data from the same census to which the "own-children" technique has been applied.

[23] See: Cho, Lee-Jay and Feeney, 1978:19

- Direct matching: Inclusion of a separate question on the Interview Schedule

  In many countries, especially those in the South Pacific Region, including Fiji, relationships within the household (including the relationships between children and their natural mother and father), tend to be less clear than in Asian countries. This is particularly the case in extended households with a complicated household composition. In these households, the matching of mothers and their own children by means of the relationship code on the Interview Schedule frequently leads to mismatches. The reason is that, although young children usually live in the same household as their 'mother', this 'mother' is not necessarily their natural mother since many children have been adopted. In countries in the region, including Fiji, it is not uncommon that foster mothers report adopted children as their own. Under these conditions, it must be expected that a significant number of children will be matched with the wrong mother.

  Because of the likely adoption bias in the relationship data, censuses/surveys in South Pacific countries usually do not attempt to match mothers with their own children by means of the relationship code. Instead, they include an additional question, inquiring about the person number of the own (natural) mother of all respondents. This is of course only possible if the own mother is:

  - Still alive

  - Enumerated in the same household as the respondent.

  During the processing phase of the census/survey, "own-children" matrices are generated, linking mothers and their (natural) children. The programme distributes non-matched cases proportionally. This does not affect the level of fertility (TFR) but it may affect the pattern of fertility.

5.3. Applying the "own-children" technique

Given the availability of "own-children" matrices and recent reasonably accurate lifetables by sex, it is now possible to carry out a comprehensive analysis of fertility levels, patterns, trends and differentials. The "own-children" matrix is the input for the EASWESPOP fertility estimation programme of the East-West Center.[24] The survival function ${}_nS_x$, of the lifetables is used to project the children under age 15 in single years and women aged 15-64, backwards over a period of 15 years. This is referred to "reverse survival". Preferably, a series of lifetables should be used that cover the entire period of 15 years. However, in Chapter VII, we have seen that, in the case of Fiji, mortality has not changed very much since the 1980s. Consequently, the

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[24] The "own-children" technique of fertility estimation was first introduced in 1965 by Grabill, W.H. and Lee-Jay-Cho. Since that time, this technique has increasingly been used in fertility analysis based on census data. See for instance: Cho, L.J., R.D. Retherford and M.K. Choe, 1986. An example of the application of the "own-children" technique can be found in UN Manual X, 1983:182-195.

use of 2007 lifetables for “reverse-survival” over the entire 15 year period, will affect the results only marginally.

5.4 The application of the “own-children” technique in Fiji

In Fiji, the 'own children' technique has been applied to census data since 1976.[25] In an attempt to minimize the adoption bias, mothers and their own children have, in all four censuses, been matched directly using the person-number of the own mother (in those cases where the own mother is alive and enumerated in the same household as her child). This does not mean that there is no adoption bias left in Fiji’s 'own children' data. Judging from the number of cases (in the unedited “own-children” tabulations) where the difference between the age of the mother and the “own” child is more than 50 years; it is likely that the adoption bias in the “own-children” data has not entirely been removed. In theory, another reason for the too large age gap between mother and child is that mothers have overstated their age. However, as shown in Chapter II, during recent censuses in Fiji, age reporting has been fairly accurate. It is believed that direct matching by means of “person-number” question, has reduced the impact of the adoption bias.

Since all censuses in Fiji, since 1976, have linked mothers and their own children, the fertility parameters, covering a period of 15 years prior to each census, have a five year overlap. This provides an opportunity to test the consistency of the estimated parameters from the various censuses.

5.5 Validity of the results based on the application of the "own-children” technique

The validity of the results depends on several factors:

- Accuracy of age reporting

  Since children under age 15 and females over the age of 15 are used for “reverse-survival” it is important that the age-sex structure of these populations is minimally distorted. Since data for children under age 15 in single years is used, age accuracy is particularly important for this group of children. In Chapter II, we have seen that in recent decades, age- misreporting (age-heaping) as well as age-shifting in Fiji has decreased very drastically.[26] Moreover, in own-children analysis based on data from previous censuses, it has been attempted to reduce the impact of age heaping on the fertility estimates by aggregating the fertility data into five-year age groups and/or by taking three- or five-year moving averages of the rates for subsequent calendar years.

[25] An 'own children' matrix including children 0 - 9 has been produced from 1976 census data and an 'own children' matrix including children 0 - 14 from 1986, 1996and 2007 Census data.

[26] As shown in Chapter II, the impact of age shifting is more difficult to assess than that of age heaping. Fortunately, there are no indications of serious systematic bias in the data from recent censuses, due to age shifting.

- Non-own factors

A very important issue is to what extent enumerators have been able to link children with their own or natural mother and have recorded this properly by means of the person-number of the own mother (in those cases where the mother is alive and enumerated in the same household as the child). The proportion of children that cannot be matched is an important indicator of the quality of the "own-children" data. An assessment of the "own-children" data of the 1976 and 1986 Censuses indicated that, nationwide, a very large proportion of children under the age of 15 could not be matched with their own mother. In 1986, 16.3% of all children have not been matched whereas the proportion for Fijian children (21.5%) was significantly higher than that for Indian children (10.7%). After the 1986 Census, it appears that these already very high proportions had further increased to 20.7 % for all children under age 15 and to 25.3% and 13.8% for Fijian and Indian children of that age group respectively. Furthermore, as expected, the proportion of unmatched cases increases rapidly with increasing age of child from age 0 to age 14 and more so in the urban than in the rural sector.

The "own-children" programme distributes the unmatched children proportionally. However, the very high "non-own" factors in the case of the 1976, 1986 and 1996 Censuses raises questions about the quality of the estimated fertility parameters. In particular, the large proportion of non-matched children in these censuses constitutes a serious problem particularly for differential fertility analysis.

During the preparation phase of the 2007 Census, and especially during the training of the Area Coordinators (quality controllers), supervisors and enumerators, special attention has therefore been paid to this important issue. Moreover, matching of mothers and own children received special care during the processing of the 2007 Census data. Table 5-1 compares the "non-own" factors of the 1996 and 2007 "own-children" data for children under the age of 15 in single years.

Table 5-1: Proportion (%) of unmatched children under the age of 15 in single years by ethnicity and geographic sector in 1996 and 2007

Age Child	All Sectors						Rural Sect.		Urban Sect.	
	Total Pop.		Fijians		Indians					
	1996	2007	1996	2007	1996	2007	1996	2007	1996	2007
< 15	20.7	3.5	25.3	4.1	13.8	2.4	20.0	4.1	21.7	2.9
0-4	17.7	2.2	21.2	2.4	12.0	1.7	16.6	2.4	19.2	2.0
0	14.3	2.2	15.9	2.3	11.0	1.9	12.4	2.5	16.6	1.9
1	16.4	2.0	19.3	2.0	11.4	1.9	15.0	2.2	18.2	1.8
2	19.6	2.1	23.2	2.3	13.1	1.5	18.3	2.3	21.1	1.8
3	19.2	2.2	23.5	2.5	12.3	1.5	18.7	2.5	19.8	1.9
4	19.1	2.4	24.0	2.7	11.9	1.6	18.3	2.6	20.1	2.3
5-9	21.6	3.3	27.0	3.9	13.7	2.0	21.2	4.0	22.3	2.5
5	20.0	2.5	25.2	2.7	11.8	1.8	19.4	2.7	20.7	2.2
6	21.0	2.8	26.1	3.1	13.3	1.8	20.9	3.3	21.2	2.3
7	22.6	3.3	27.8	3.8	14.6	1.9	21.8	4.1	24.0	2.3
8	22.4	3.9	27.9	4.6	14.6	2.2	21.8	4.6	23.1	3.0
9	25.5	4.2	28.1	5.2	14.7	2.3	22.2	5.3	22.8	2.9
10-14	24.9	5.1	31.8	6.1	16. 6	3.2	23.7	5.9	26.3	4.1
10	23.5	4.4	29.3	5.1	16.1	2.9	23.0	5.0	24.1	3.7
11	24.0	4.4	30.6	5.1	16.0	2.8	23.5	5.3	24.7	3.3
12	25.0	4.7	31.6	5.8	17.2	3.1	23.8	5.7	26.6	3.6
13	25.6	5.2	33.0	6.2	16.7	3.3	23.7	5.9	27.8	4.3
14	26.2	6.6	34.5	8.4	16.7	3.7	24.4	7.7	28.3	5.4

The data suggests that the emphasis on the importance of proper matching of mothers and their own children during the field operation and processing of the census data has led to a very drastic improvement in the quality of the "own-children" data.

- <u>The quality of the lifetables that are used for "reverse-survival".</u>

It will be realized that, in a situation of changing mortality, the use of only one lifetable for the reverse-survival of mothers and their own children introduces a certain amount of bias in the estimated fertility parameters. The extent of the bias depends on the extent of mortality change. In the case of Fiji, it was shown (in Chapter VII) that mortality in Fiji has changed only marginally since 1986 and may have increased somewhat during the most recent intercensal period. In other words, the mortality transition, and particularly the adult mortality transition, has been stalling. It is therefore likely that the bias introduced by using only 2007 lifetables for the reverse-survival of children and mothers will be minimal.

- Differential under-enumeration

  The extent of under-enumeration during the 1976, 1986, 1996 and 2007 Censuses in Fiji is not precisely known. As mentioned in Chapter I, no Post Enumeration Survey (PES) has been conducted after any of these censuses. During the analysis of the “own-children” data of these censuses, it was assumed that differential under-enumeration (of females and children) was approximately the same. If this assumption is correct, the impact of under-enumeration on the 'own children' estimates of fertility will be negligible.

- Migration

  In a particular population, children who were age x at the time of the census are the survivors of the births that occurred in that population x years earlier. However, this is only the case in a population closed to migration. In reality, since the 1980s, the population of Fiji has been very significantly affected by international as well as internal migration. With regard to the former, this applies in particular to the Indian population. Generally, it may therefore be expected that the “own children” estimates of fertility have a certain migration bias. However, mothers often migrate together with their own children, especially if these children are still very young. Consequently, fertility rates may not be very much affected by migration bias if net-migration rates of mothers and children are approximately the same.

  In this connection, it should be mentioned that the series of 'own children' estimates covering a period of 15 years prior to the census are usually interpreted as referring to the population (or a subgroup of the population) enumerated during the census. It is conveniently assumed that, on average, in- and out-migrants during this 15-year period have the same basic characteristics including fertility characteristics. In the case of international migration, this assumption may be reasonable.

  It is unlikely that inter-provincial and especially inter-sectoral in- and out-migrants during the 15-year period prior to the census have on average the same characteristics. It may be expected that the internal migration bias in the own-children estimates of fertility are more significant than in the case of international migration. It is likely that differential fertility estimates based on the “own-children” technique for some urban areas with very significant migration are not insignificant.

  In sum, it must be assumed that the national level estimates of fertility, especially differential fertility, based on the “own-children” technique are more accurate than the provincial estimates. Moreover, estimates for the urban sector and particularly those for some urban areas are most affected by a migration bias. The estimates for Fijians may be less affected than those for Indians. Finally, it may be expected that the recent 'own children' estimates (those referring to the time immediately before the census) are only marginally affected by migration bias.

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