Population Ageing and the Theory of Demographic Transition: The Case of Mauritius

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Abstract

Purpose – From high fertility and mortality rates in the 1960's, Mauritius has seen a demographic transition such that today population growth is among the lowest in the developing world. This has inevitably brought about the problem of ageing. The main objectives of the study are firstly to throw light on the demographic processes that have brought about changes in the age structure of the population thereby making ageing an inevitable outcome and secondly to take stock of the demographic profiles: population projections 2010-2040 made by the Mauritian Central Statistical Office.

Design/methodology/approach – In this paper, use of only secondary data has been made. Most of the secondary data come from books, internet search, government documents and data from Central Statistical Office.

Findings – The principal finding of this research indicates that Mauritius has completed its demographic transition in less than four decades. The fall in mortality rates and fertility rates have led to an improvement in the life expectancy of the population and consequently, the society is ageing.

Research implications – This paper has much relevance in the fast developing Mauritian society as it may help the authority at reviewing its strategies regarding both formal and informal care system with a view to improve the welfare and living conditions of the elderly population.

Originality/Value – Although some studies have been done on ageing yet none of them has really explained the demographic transition. This study has attempted to do so and the results will be useful to the Mauritian state to develop appropriate plans and programmes to deal with ageing.

Keywords: Ageing, Demographic Transition Theory, Population, Life expectancy, Fertility Rates, Mortality rates.

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1. INTRODUCTION

The year 1999 was declared, by the United Nations, as the International Year of Older Persons. More than a decade has passed since then and it is essential that we take stock of the advancement done to improve the welfare of the ageing population. A 'prise de conscience" among the World Population, which has reached 7 billion in October 2011, is more than necessary given the new challenges awaiting us all to make the lives of the elderly enjoyable.

Some years back, this ageing issue was a concern of mostly the European countries which had already completed their demographic transition. Today, population ageing has become a global phenomenon with serious implications for the developing countries as well. Consequently, governments in developing countries have started developing plans and programmes to address the challenges posed by ageing.

From high fertility and mortality rates in the 1960's, Mauritius has seen a demographic transition such that today population growth is among the lowest in the developing world. This has inevitably brought about the problem of ageing.

The main objectives of the study are:

(a) to throw light on the demographic processes that have brought about changes in the age structure of the population thereby making ageing an inevitable outcome; and

(b) To take stock of the demographic profiles: population projections 2010-2040 made by the Mauritian Central Statistical Office.

For the sake of this paper, the methodology used will comprise only secondary data. Most of the secondary data come from books, internet search, government documents and data from Central Statistical Office. Although the methodology used has its limitations yet it is relevant and appropriate for this particular study, where secondary data are of primary importance. Given that most of the secondary data are taken from government sources and the international organisations, the reliability of the outcome of the study will bear credit.

The first part of the paper will deal with the definition of the concepts of ageing and ageing country followed by an overview of ageing worldwide. In the second part, we shall apply the demographic transition theory to explain the demographic change in the island of Mauritius. Then, an account of the population projections 2010-2040 will be given. Finally, a conclusion based on the study is stated.

2. DEFINITIONS OF 'AGEING' AND 'AGEING COUNTRY'

Ageing

The term 'ageing' does not have a universal definition. In different countries, ageing is defined differently. Therefore, conceptualising 'ageing' becomes problematic. In the Oxford Advanced Learner's Dictionary, the term 'ageing' means 'the process of growing old or changes that occur as the result of passing of time'. The United Nations considers age 60 years as the threshold of old age. In United States of America, someone aged 65 years and above is called elderly. In Mauritius, the official age of retirement has recently been changed from 60 to 65

years. However, we are still in a transition period where aged 60 and above continues to be considered as the threshold for old aged and even the universal basic retirement pension is provided as from this age. Therefore, in this paper, by 'ageing' is meant those in the age group 60 years and above.

It is worthwhile to note that the definition of ageing with regard to chronological age or retirement age could be regarded as subjective. There are people who are above 60 years of age and yet they do not consider themselves old. On the contrary, they view themselves as young, productive and healthy. On the other hand, the unhealthy, disabled and poverty stricken ones regard themselves as old well before they reach 60 years of age.

In Gerontology, the following criteria are used to describe ageing.

a) Chronological 'ageing'- people grow old as a result of passing of time. An example of chronological definition of old age is the retirement age at 65 years in Mauritius. Chronological age by itself, however, is rarely an accurate indicator of a person's biological, psychological or social age (Lewis R. Aiken, 1995)

b) Biological Ageing- In defining biological age, features such as posture, skin texture, hair colour, strength and sensory activity are taken into consideration (Lewis R. Aiken, 1995). A frail person aged 50 with grey hair and wrinkles may be considered as old.

However, each society has its own definition for the social roles and activities that are expected are expected from its members depending on their ages or levels of maturity.

Ageing Country

According to the United Nations Intellectual History Project (2009), the world population is ageing, including in developing countries. An ageing country is one

where the rates of fertility is below the replacement level, the mortality rates are falling at older ages and the median ages are rising. The World Population Ageing 1950-2050 Report defines population ageing as a process by which older individuals become a proportionally larger share of the total population in a country. Gavrilov & Heuveline (2003) refer to population ageing as a summary term for shifts in the age structure of a population toward older ages. Population ageing is the result of a fall in the fertility rates and of mortality decline at older ages. In many countries the aging of population is measured by an increase in percentage of either people reaching 60 years of age or elderly people of retirement age, which may be aged 60 or aged 65 depending on societies. According to Gavrilov & Heuveline (2003), a society is considered relatively old when its population aged 65 and above is more than 8-10%. Given that the retirement age in Mauritius has recently changed from aged 60 to aged 65 and that the Mauritian authority is continuing to pay universal non contributory pensions as from the age of 60 years, the Mauritian society falls under category of an aging society as the fraction of the population aged 60 and above exceeds the 8-10 %, as shown in Table 1. By the standard as argued by Gavrilov & Heuveline (2003), most of the European countries are relatively old as the percentage of elderly people is well above 8-10%.

Ageing - A World Wide Phenomenon

On the basis of the report on the World Ageing Population 1950-2050, prepared in 2002 by the Population Division of the United Nations, the size and percentage of the elderly in Table 1 below are briefly analysed. According to the 2002 population indicators, we find that in 2000, 10 % of the world populations was aged 60 years and over while for the same period, the population of 65 and over stood at 6.9 %. In 2050, it is estimated that the 60 and over age group will be around 21.1 % while that of age group 65 and over will be 15.6 % of the total world population respectively. In Europe 20.3 % of the population belonged to the old age group 60 and over in 2000 while in Africa the corresponding proportion was 5.1 %. In 2050, Europe seems to continue on the same trend and it will have

the highest proportion of elderly, 36.6 % for the age group 60 and over compared to 10.2 % of the same age group in Africa.

Regarding Mauritius which forms part of Africa, in 2000, the proportion of 60 or older stood at 9.0 % and 6.2 % for the age group 65 and over of the total population respectively. In 2050, Mauritius is estimated to have an elderly population of 26.1 % and 20.3 % of the total population for the aged groups 60 and over and 65 and over respectively.

Table 1: Estimated World Population aged 60 or over & 65 or over (2002)

	Year 2000			Year 2050		
Country	Total Population (millions)	Aged 60 and above as a % of total population	Aged 65 and above as a % of total population	Total Population (millions)	Aged 60 and above as a % of total population	Aged 65 and above as a % of total population
World	6,056.71	10	6.9	9,322.25	21.1	15.6
Europe	727.30	20.3	14.7	603.33	36.6	29.2
Africa	793.63	5.1	3.3	2,000.38	10.2	6.9
India	1,008.93	7.6	5	1,572.05	20.6	14.8
Malaysia	22.22	6.6	4.1	37.85	20.8	15.4
Mauritius	1.16	9	6.2	1.42	26.1	20.3
Singapore	4.02	10.6	7.2	4.62	35	28.6

Source: World Population Prospects, The 2002 Revision United Nations Publications

A comparison of the demographic situation with Malaysia and India shows that Mauritius had a higher percentage of elderly in both aged groups in 2000 and the trend seems to continue till 2050. On the other hand, Singapore had a slightly higher percentage of old people than Mauritius in 2000 and in 2050 it will have a much higher proportion in both aged groups. As far as elderly population in absolute term is concerned, Mauritius has a lower number of aged than all others. Anyway, for the sake of comparison, percentages give a better view than absolute figures. From the figures in the above table, it is a clear fact that Mauritius has already stepped into a stage where it may be referred to as an ageing society.

3. DEMOGRAPHIC PICTURE IN MAURITIUS

An analysis of population trends since 1944 shows how the population of Mauritius has evolved over the years, in terms of both structure and size. Such an exercise is also important since it helps to cater for the needs of the growing population, especially the ageing group. The demographic evolution for the period 1944-2010 is shown in Table 2 below.

Table 2: Population growth in intercensal periods - Island of Mauritius 1944-2000

Census Data	Population enumerated at Census	Average annual rate of increase (%)
11th June 1944	419,185	0.49
30th June 1952	501,415	2.26
30th June 1962	681,619	3.12
30th June 1972	826,199	1.94
2nd July 1983	966,863	1.44
1st July 1990	1,022 456	0.80
2nd July 2000	1,143 069	1.12
December 2010	1,245289	0.40

Source: Central Statistical Office, (Compiled figures from 2005 and 2010 Reports), Port-Louis

According to the 1944 census, the size of the population was 419, 185 and the annual rate of population growth was well below 1% p.a. Since then, there has been a rapid increase in the population. The total population reached 501,415 in 1952. The growth of population continued rapidly and the 1962 census accounted for a population of 681,619. The situation started to get critical during that period

as annual growth rate of population of 3.12 % was among the highest in the history of the country.

Prof. R. Titmuss, a social scientist from London School of Economics, was invited by the government in 1959 to give advice on the course of action to be taken in the light of the alarming problems of population growth. Prof. Titmuss warned that if the rate of population growth was not checked, serious repercussions would result and thereby affecting the health and social services. He proposed the setting up of a nation-wide family planning service to curb population growth.

In the late 1960's, a report by Professor Meade stated that the rate of population increase of about 3% per annum was one of the highest in the world. He also said that if no measures were taken, the island would end up with a population of not less than 3 million people by the year 2000. He predicted that Mauritius would face tremendous social problems by the new millennium. He drew the attention of the government to the fact that unemployment and large scale famine could result if the situation persisted. Acting on Meade's recommendations, the government sought to control birth rate at all costs. However, the strong opposition from the various religious bodies frustrated government's attempt to set up a nation-wide family planning programme. So government supported the activities and subsidized the programmes of the voluntary organizations, like the already established Mauritius Family Planning Association (MFPA) in 1957 and the Action Familiale in 1964, with a view to control birth rate. In 1972, the MFPA was integrated in the Ministry Of Health. The advent of television in 1966 and free secondary level education since 1976 helped in disseminating information on family planning to the population. The result was that the average annual rate of population growth from about 3% p.a. in the early 1960's fell to 1.4% p.a. in early 1980's. The trend continued and as early as midst 1980's the average population growth rate dropped to less than 1 % p.a by the year 2000. Since then, the average rate of population growth has remained stable. Consequently, Mauritius has been successful in controlling its birth rate.

4. APPLYING THE THEORY OF DEMOGRAPHIC TRANSITION IN MAURITIUS

The theory of demographic transition, which shows how a country experiences significant changes in its mortality and birth rates leading to moderate growth rate in future was derived from the observation of a process of demographic change in western countries, consisting in a gradual evolution from high birth and death rates to low ones in response to the social and economic changes brought about by industrial modernization (Notestein, 1945). In simple term, the demographic transition model describes the movement from high birth and death rates to low birth and death rates in a country which is developing and where modernity and industrialisation are taking place.

We now turn to a more in-depth analysis of the demographic transition. Crude birth rates (CBR) and crude death rates (CDR) figures found in Table 3 below have been used for this purpose. Although these indicators do not reflect fertility and mortality levels accurately, they do determine the rate of natural population growth rate and reveal, to a large extent, the influence on the population age structure. Another component of demographic change is international migration, which, given its relatively marginal influence on growth and population structure and because trends are not easily foreseeable, has not been taken into account in this study.

Birth rates and death rates affect the population of a country. Crude birth rate (CBR) refers to the number of live births occurring during the year, per 1,000 population estimated at midyear while crude death rate (CDR) means the number of deaths during the year, per 1000 population estimated at midyear (Macionis, 2000). The rate of natural increase, which is equal to the rate of population change in the absence of migration, is obtained by subtracting the crude death rate from the crude birth rate. On the other hand, Infant Mortality rate (IMR) relates to the number of deaths among infants under one year of age per 1000 live births during a year.

The table 3 below shows population and vital statistics about CBR, CDR and IMR. Regarding population statistics, the population at mid- period figures shown in the table 3 relate to figures that are compiled normally in June-July by the Central Statistical Office (CSO) each year with the exception for 2010, where figures available were for the month of December. Regarding the years 1950 and 1960, population at mid-period data were not available from the CSO and therefore the 1946 -50 average and 1956-60 average figures were taken for analysis purpose.

Table 3: Population and vital statistics rates- Island of Mauritius 1946-2010

Period	**Population at mid-period**	**Crude Birth rate**	**Crude Death Rate**	**Rate of Natural Increase**	**Infant Mortality Rate**
1946-50 Average	483,797	44.7	20.8	23.8	119.6
1956-60 Average	609,518	40.7	11.6	29.1	68.5
1970	805,489	26.8	7.8	19	57.0
1980	937,886	26.6	7.1	19.5	32.3
1990	1,024,571	21.3	6.7	14.6	19.9
2000	1,186900	16.9	6.8	10.1	15.8
December 2010	1,245,289	11.5	7.2	4.3	12.4

Source: Central statistics Office, Port Louis (Compiled figures from 2005 & 2010 statistics)

The demographic framework drawn depicted in table 4 is based on the statistics from tables from 2 and 3.

Table 4: Demographic framework

Period	**Crude Birth Rate**	**Crude Death Rate**	**Rates of Natural increase**	**Infant Mortality Rate**
1946-1970	High	High	Very High	Very High but Falling
1970-1980	High but falling	Moderate	High	High but Falling
1980-2000	Moderate to low	Moderate to low	Moderate to low	Slightly High but Falling
2000 onwards	Low	Low	Low	Moderate

Source: Statistics from Tables 2 and 3

The above tables 2, 3 and 4 are useful for describing the pattern of change registered in the evolution of the Mauritian population. The demographic transition, as explained below, has occurred in various phases in Mauritius.

(i) PHASE 1- Early stage: 1946-1970 (Tables 2 and 3)

During the Phase 1 period, Mauritius experienced high CBR and high CDR that resulted into a very high natural growth rate. For instance, for the period 1956-60 the CBR was 40.7 while the CDR was 11.6 resulting into a very high rate of natural increase of 29.1. The IMR was very high but falling during that period 1946-1970. The IMR which was on an average of 119.5 in the 1950's declined to 68.5 in the 1960s. Although CDR and IMR were high, yet the very high annual population growth rates caused the total population to increase during that period, from 483 797 in 1946-50 to reach 609 518 in 1956-60.

The level of development was low and the society was predominantly traditional during the phase 1 period. The economy was based primarily on agriculture. There was a lack of information on family planning and the health care systems were not much developed.

(ii) PHASE II- Moderate Transition: 1970-1980 (Tables 2 and 3)

In this period, the CBR was high but slightly declining, from 26.8 in 1970 to 26.6 in 1980. Mauritius also experienced a high but falling IMR, reaching 32.3 in 1980 from 57 in 1970, as shown in table 3 above. The high but falling CBR and moderate CDR during the 1970 -1980 period resulted into a high natural growth rate which caused the total population to continue increasing from 805 489 in 1970 to 937 886 in 1980**.** On the other hand, during that period, Mauritius witnessed the diversification of its economy. With the setting up of the Export Processing Zone sector in the early 1970's, there was a change in the labour market as more women joined the industries. However, the average level of growth rate and development were still low during the period 1970-1980.

(iii) PHASE III -Full Transition: 1980-2000 (Tables 2 and 3)

In this period, Mauritius enjoyed a moderate to low CBR and also a moderate to low CRD. CBR and CDR fell from 26.6 and 7.1 in 1980 to 16.9 and 6.8 respectively in 2000. The fall in both CBR and CDR accounted for the increase in population at a relatively slower pace. The rate of population growth was already around 1% p.a as early as 1990s, as shown in Table 2. IMR, although slightly high, was falling during this period as shown in table 3 above, declining from 32.3 in1980 to 15.8 in 2000. The fall in CDR and IMR can be explained partly by the progress made in the health sector. During the 1980s, fertility rates started decreasing quite rapidly as many women joined the labour force in the Export Processing Zone sector. As a result, there were fewer children among couples and the trends towards birth spacing were remarkable. On the other hand, the effect of free secondary education became visible in the 1980s as many parents preferred to send their daughters to schools and getting them married at a later age. A decade earlier, girls had to stay at home after finishing primary schools and marriage at an early age was very common resulting into many women bearing children at younger ages.

Therefore, the fall in fertility and mortality rates could be attributed to the industrialisation of the Mauritian economy and to the availability of better health facilities and the impact of free secondary schools in the country. As a consequence, population growth rate fell to nearly the replacement level.

(iv) <u>PHASE IV Advanced Transition: 2000 onwards – (Tables 2, 3 and 4)</u>

In an advanced transition phase, countries witness very low birth rate and very low death with average natural growth rate is situated around 1% p.a or even less. Most of the developed nations are in such a phase as the birth and death rates are low with a natural rate of growth of approximately 1% p.a. Since 2000, Mauritius has witnessed an annual average growth rate of population of less than 1% p.a (Table 2). The low CBR, low CDR rates, low annual growth rate of population and the

moderate IMR, as shown in Tables 3 and 4 above, are objective factors that can be used to classify Mauritius in the advanced transition phase.

The reduction in birth and mortality rates has had important consequences for the country. The fall in the mortality rate has led to an increase in the life expectancy which has resulted in the process of an ageing population in the Mauritius.

5. CONTRIBUTION OF THE FERTILITY AND MORTALITY RATES AND LIFE EXPECTANCY TO THE AGEING PROCESS

The Total Fertility Rate (TFR) which was an average of 6 children per woman in the 1960s fell to an average of 3 children per woman in the 1970s and now it is around 1.8 children per woman (Central Statistical Office, 2010). The fall in TFR after 1980s can be explained by the fact that many women joined the labour force, mainly in the newly established Export Processing Zone sector and also the impact of free education where more girls started to go for higher education. Consequently, girls preferred marrying late and choosing to have fewer children.

Moreover, there was already a latent demand for birth control among couples. Since 1970s, the Mauritius Family Planning Association and the Action Familiale have played a vital role in bringing down TFR. The declining fertility has contributed to bring about the ageing of the population in the sense that families were in a better position to cater for the health and welfare of the limited number of members at home. Consequently, people could live well and longer.

The Infant Mortality Rate (IMR) is often considered as a revealing index of the quality of life of a population. The IMR which stood at 119.6 (per 1000) in 1946-1950 fell to 19.9 (per 1000) in 1990 and in 2010 it was 12.4 (per 1000). The main reason for this continuous decline was the tremendous improvement in public health and sanitation. Better medical facilities increased the chances of survival of the new-born. Consequently, this decline in mortality led to an increase in life expectancy of the people which resulted into an ageing population.

The expectancy of life at birth, as shown in table 5 below, is another important indicator assessing the overall health of a nation. The improvement in life expectancy has also contributed to the gradual increase in the numbers of aged in Mauritius. Life expectancy at birth which was 58.7 years for male and 61.9 years for female in 1962 has progressively increased to reach up to 69.3 years for males and 76.5 years for female in 2010. Consequently, a process of ageing has taken place as more and more people are living up to more advanced ages.

Table 5: Life Expectancy at birth by sex, Island of Mauritius

	Island of Mauritius	
Years	Male	Female
1962	58.7	61.9
1972	60.8	66.0
1983	64.4	71.8
1990	65.6	73.4
1997	66.6	74.4
2000	68	75.3
2010	69.3	76.5

Central Statistical Office, Port-Louis

6. DEMOGRAPHIC PROFILE: POPULATION PROJECTIONS (2010-2040) - AN OVERVIEW

The table 6 below gives a view of the population Projections for the period 2010-2040. It is found that the total population of Mauritius will increase from 1,255 312 in 2010 to 1,430 501 in 2040. Consequently, over the next 30 years, the age group 60 and over will rise from 11% to 24 % while that of age group 65 and over will increase from 7.1 % to 17.4 %. The projections show that ageing population will grow at a quite rapid pace in the years to come.

Table 6: Distribution of the resident population by selected age group, age indicators, Island of Mauritius, 2010-2040

Year	2010		2020		2030		2040	
Age group (Years)	Number	%	Number	%	Number	%	Number	%
60 and over	138300	11.0	214905	16.0	294364	21.0	343402	24.0
65 and over	89513	7.1	139667	10.4	210577	15.0	249025	17.4
Total population	1,255312		1,343221		1,405031		1,430501	
Mean age	33.7		36.3		38.6		40.2	
Median age	32.5		35.7		38.2		40.1	

Source: Central Statistical Office, Port Louis

From the above table, we also find that both the mean age and median age will rise during the 2010-2040 period. For instance, the mean age which was 33.7 years in 2010 would reach 40.2 years in 2040. Besides, the median age will reach 40.1 years in 2040, up from 32.5 years in 2010, meaning that half of the population of Mauritius will be older and half younger than 40.1 years. This shows clearly that the population of Mauritius will continue to grow older in the next 30 years. As a consequence, the old age dependency ratio will also rise. A growing old age dependency may mean a substantial change in both the informal and formal caring system. On the other hand, given that the government of Mauritius has recently raised the retirement age from 60 years of age to 65 years of age, the pensioners support ratio will not fall from its actual level for some more years. Although, it is believed that government may be able to reduce its social security spending yet the problem of ageing will pose many other challenges for the country to face.

7. CONCLUSION

Mauritius has completed its demographic transition in a short period of about five decades. In the paper, we have explained as to how a fall in the rates of mortality and fertility, from a high level in the 1950s to a low one since the beginning of the new millennium, has contributed to bring about an increase in the life expectancy at birth and a process of ageing of the Mauritian population respectively. The population ageing is projected to grow, with both the mean and median ages rising. Mauritius will experience a dramatic ageing of its population during the coming three decades. Therefore, the country needs to prepare itself to meet the challenges posed by ageing. Consequently, scientific studies have to be undertaken to revisit both the formal and informal care systems with a view to improve the lives of the elderly population.

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