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Addenda and Errata

- Page ii. Para 4. Line 1. and also page 18. para 2. insert a colon instead of a semi-colon.
- Page xvii. Name of atoll, “Felidhu” to read as “Felidhu atholhu”
- Page 9. Para 2. Line 5. To read as “...for their children...”.
- Page 13. Para 1. To read as, “Part D contains chapter 19, which provides a synthesis...”.
- Page 23 Para 2. Line 7. To insert the following in brackets after the term “industrial islands”: “uninhabited islands, other than tourist resorts, that are exclusively designated for industrial purposes”.
- Page 34. Second sentence to read as, “While it is likely to be a difficult task to find clear theoretical ...”.
- Page 42. Para 1. Line 5. To include reference to “Bedford, 1973, 1985”. “Walsh 1973” to read as, “Walsh, 1972”.
- Page 48. Figure 3-1. “Social factors” to read as, “Social and political factors”.
- Page 60. Line 4. To insert “have” instead of “has”.
- Page 70. Para 2. At the end of para to insert, “(see Map of Maldives, pages xvii and xviii).”.
- Page 88. Line 9. “...fertility of unemployed women can only be...” to read as, “...fertility of unemployed women may be...”.
- Page 90. Figure 5-3. to insert footnote, “Note: scale starts at 26”.
- Page 92. line 9. and page 135. line 1. Replace the word “practise” with “practice”.
- Page 99. Para 3. “An attempt is....”.
- Page 124. Para 4. Sentence 1 to read as, “The central location of Male’, the capital island, and its pre-eminence among all the inhabited islands of the Maldives, have always attracted migrants from the other islands of the country”.
- Page 129. Figure 7-2. Add “(Percentage distribution)” to title.
- Page 131. Figure 7-3. Title to read as, “Percentage distribution of Lifetime Migrants Aged Six Years and Over by Reasons....”. Line 1 to read as “The age distributions of lifetime migrants by reason for migration are shown in the graphs in Figure 7-4.” Rest of the sentence should be deleted and the formatting of the sentence changed.
- Page 132 Para. 2. At the end of the para. to insert, “The large proportions of migrants in the reason not stated category are likely to be due to non-response to the question on reason for migration.”

- Page 155. Line 2. Delete the word “while”. Line 8. Delete the word “proper”.
- Page 159. Para 3. Line 9. “...resorts most probably will be...”.
- Page 176. Line 11. “...literature are available...”.
- Page 210. Figure 10-1. The numbers 1-21 on the x-axis below the figures should be names of atolls in the following order:
- | | | |
|------------------------|--------------------|------------------|
| 1 North Thiladhummathi | 9 North Ari | 17 North Huvadhu |
| 2 South Thiladhummathi | 10 South Ari | 18 South Huvadhu |
| 3 North Miladhummadulu | 11 Felidhu atholhu | 19 Foammulaku |
| 4 South Miladhummadulu | 12 Mulakatholhu | 20 Addu |
| 5 North Maalhosmadulu | 13 North Nilandhe | 21 Male' Island |
| 6 South Maalhosmadulu | 14 South Nilandhe | |
| 7 Faadhippolhu | 15 Kolhumadulu | |
| 8 Male' atholhu | 16 Hadhdhummathi | |
- Page 225. Table 10-8. Title to include, “US \$ 1.00 = Rufiyaa (Rf.) 11.72 (1995)”.
- Page 238. Para 2. Line 6. Replace the word “incited” with “compelled”.
- Page 267. Para 2. Line 1. “ The ... review...has shown...”.
- Page 274. Para 2. Line 2. Replace “human resources” with “human capital”.
- Page 276. Section 13.1. At the end of para 3 to insert, “(see Appendix 4)”.
- Page 279. Line 8. Insert “Appendix 4.” at the end.
- Page 311. Line 1. To read as, “The determinants of the educational aspect of human capital can be measured either as the input or the output of the educational system.”
- Page 318. Para 2. Third sentence to read as, “In the extended family settings where there are other...it is less likely...”.
- Page 338. Para 1. Section 16.1.5. Third sentence to read as, “It seems that educational attainment...male labour force participation than it is for females in the rural Maldives.”
- Page 350. Line 3. Replace “Annex 3” with “Appendix 4”.
- Page 379. Line 1. To read as “...in Part B consist...”.

The following bibliographic references to be inserted in the Bibliography (pages 425-457):

- Bedford, R., (1973), *New Hebridean Mobility: A Study of Circular Migration*, Publication HG/9, Canberra: The Australian National University Press.
- Bedford, R., (1985), Population Movement in a Small Island Periphery, in Chapman, M. and Prothero, R. (eds.), *Circulation in Population Movement: Substance and*

Concepts from the Melanesian Case, London: Routledge and Kegan Paul, pp. 333-359.

Miralao, V., (1991), *Women's Status and Development Trends in the Maldives: A Survey Report*, UNIFEM Project MDV/88/W02: Strengthening the Capacity to Plan for the Involvement of Women in Mainstream Development, Male': Department of Women's Affairs.

Population, Human Capital and Development in the Maldives

A Thesis Submitted in Partial Fulfilment
of the
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Hussain Niyaz

2000



**The
University
of Waikato**
*Te Whare Wānanga
o Waikato*

Abstract

The relationship between population and development has drawn the attention of economists and demographers for a long time. While academic interest has focused on population and development problems of small island countries, much of it is centred on the Pacific countries and the island states of the Caribbean, but it may be argued that these problems are common to all small island countries.

Past demographic trends in the Maldives have created a young population structure. The negative impacts of these rapid demographic changes on the national economy have been significantly minimised by rapid economic growth in the past three decades. However, it may be argued that the presence of a large and growing expatriate labour force may hinder the socio-economic development of households in the rural areas by impeding the flow of incomes from the modern sectors to the households in the islands. Development of indigenous human capital is thus crucial in ensuring equitable development, especially in a small, resource-scarce nation like the Maldives.

The links between population growth, human capital and development are determined by actions taken at the micro (family) level. Understanding which of these micro-level factors encourage or hinder the development of human capital and labour supply – particularly for women and people living in the far-flung atolls – is therefore crucial.

The present thesis explores the following broad questions; what are the trends and differentials in population, human capital, and development at the macro-level in the Maldives? What are the interrelationships between population, human capital and development at the household level? How do changes in the modern economic sectors translate to basic development across all social, economic and human capital sectors? How do the micro-macro and macro-micro links between population, human capital, and development described above interact in the present context?

Analysis is conducted at two levels. Aggregated census data from different sources, published and computerised, for the years 1977, 1985 and 1995, and published data from other documents are used to study macro-level trends and differentials. At the micro-level, random samples for urban and rural populations, drawn from the computerised individual-level data for the 1995 census are used to explore the interlinkages between fertility, human capital and development. Statistical analysis is performed using logistic and multinomial logistic regression techniques. Findings from the multivariate analyses are supported by qualitative data collected by the author in three different inhabited islands of the Maldives during December 1998 to February 1999. Qualitative data also provide some insights to the macro-micro interlinkages between the key concepts studied in this thesis.

Macro-level analysis shows that overall levels of fertility have declined in the Maldives during the period 1985 to 1995. Through its influence on increasing

contraceptive use and delayed marriage, growth of education is found to be the most important factor of this decline. An important aspect of human capital, nutrition, is found to have lagged behind the general improvements in overall health. This is due to the dietary habits rather than lack of affordability.

Past demographic trends and future projections suggest that the momentum effect of the present age structure is expected to continue. In addition to age-structural effects of population growth, the study shows that internal migration and the resulting spatial imbalances in population distribution have also affected social and economic infrastructures. However, internal migration and urbanisation have also been crucial for the creation of a scale economy in the urban area that has boosted macro-economic growth during the past three decades.

At the micro-level, despite the effects of an increasing expatriate labour force and a largely segregated tourism industry, the present study shows that the families in the rural households have benefited greatly from economic growth. Rural to urban circular migration of males is found to be the route of the flow of income from the largely urban centred economic growth to the rural households. With the exception of the southernmost islands, geographical factors are found to be important in the distribution of economic benefits to the population.

The study also shows that, perhaps due to socio-cultural factors, women in the Maldives seem to be increasingly marginalised from the workforce. Increasing household income appears to have a depressing effect on the participation of women in economic activities.

To the knowledge of the author, no other research has been undertaken to study the interlinkages between population, human capital and development in such detail in the Maldivian context. The thesis therefore provides valuable insights into the relationships between these variables in a small island setting, and thus contributes to expanding the knowledge base on the relationships between population, human capital and development. The findings from this study may also provide important policy directions for other small islands populations.

This thesis is dedicated to my late mother (Aishath) and to my father (Ahmed).

Acknowledgements

If not for the generous assistance of several people, too numerous to mention here, this study would not have been possible. I sincerely thank all of them. Special thanks are owed to the members of my supervisory team, Professor Ian Pool, Dr. A. Dharmalingam, and Dr. Sarah Hillcoat-Nallétamby of the Population Studies Centre, The University of Waikato, for their advise and guidance in conducting this study and for their helpful assistance and comments on several drafts of this thesis. Their roles were critical in getting this dissertation to its present form.

I thank the Population Studies Centre for giving me the opportunity to conduct this study. This study has benefited from the various discussions I have had with my fellow students at the Population Studies Centre, for which I sincerely thank all of them. I also thank Bev Campbell for providing all the logistical support, and Sandra Baxendine for her help with the data. I am grateful to Fathmath Shafeega for undertaking the task of proofreading my draft and providing some valuable suggestions. Hussain Kisan helped me with the preparation of the maps of the Maldives presented in this study. I sincerely thank him for that.

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The qualitative data presented in this thesis provide valuable insight to the findings from census data. I thank all those anonymous respondents in the selected islands of the Maldives for kindly providing the information.

I would like to express my heartfelt thanks to my parents for their perseverance and sacrifices, against extreme hardships, to provide their nine children with schooling. Their love and encouragement has been my inspiration. The encouragement and support provided by my four brothers and four sisters are also gratefully acknowledged.

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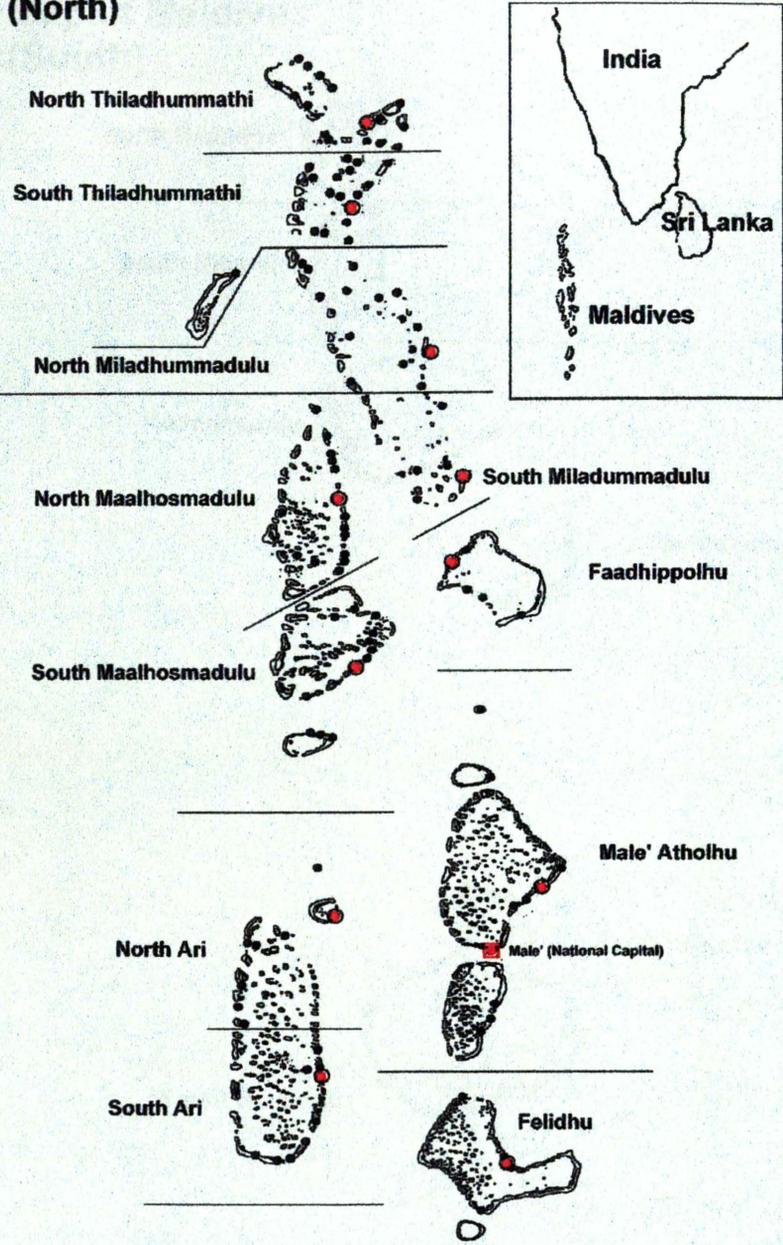
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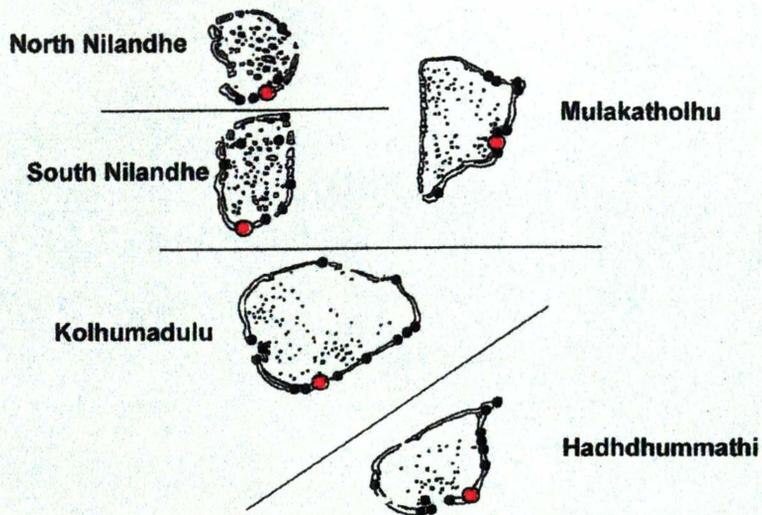
Map of Maldives (North)



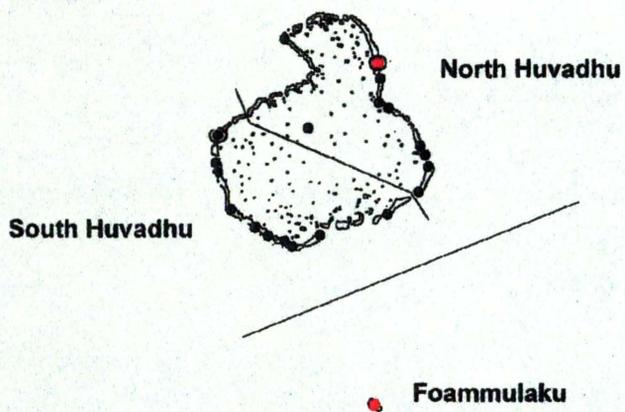
- Atoll capitals
 - Inhabited islands
- Scale: 1:1,650,000

Source: Ministry of Planning and National Development and UNDP, 1999:xii-xiii, modified by author

Map of Maldives (South)



PART A: INTRODUCTION AND BACKGROUND



● Atoll capitals
● Inhabited islands
Scale: 1:1,650,000

PART A: INTRODUCTION AND BACKGROUND

Chapter 1: Introduction

1.1 The Research Problem

The second half of the 20th Century witnessed unprecedented growth in the global population, the major share of which occurred in the poorest countries of the developing world (United Nations, 1994). Due to the absolute numbers added to the world population by the developing countries with huge populations, global forums on population such as the International Conference on Population and Development convened by the United Nations in Cairo in 1994 failed to hold adequate discussions of population problems of small island countries, and have instead been mostly concerned about the population problems that are of relevance to the large developing countries of the world.

At the global level, academic interest in the relationship between population and development has existed for a long time (see Chapter 3). With the emergence of the Newly Industrialising Countries of Asia and Latin America, the decades of the 80s and 90s saw growing interest in this area of research (Ogawa, Jones and Williamson, 1993; ESCAP, 1986; Cassen, 1994).

Although the size of the populations of small island countries like the Republic of Maldives and those of the Pacific may make their population problems seem infinitesimal and therefore, of less interest at the global stage, from the perspective of these countries, they are immense and complex. Probably arising from their historical and political links with their particular metropolitan countries, especially their universities, academic interest has existed on the problems relating to smallness, remoteness and isolation, and their links with the populations of other small island nations. Much of the English and French language literature focuses on the Pacific countries and the island states of the Caribbean. Driven and facilitated by such academic interest, regional conferences, devoted to the discussion of population and development problems of the small island countries in the Asia-Pacific region, have been

conducted (United Nations, 1982a, 1982b; South Pacific Commission, 1970, 1976, 1993,1994) although much of it is focused on the Pacific island states¹.

Small island states around the world share certain common features. Among these are limited viability (political, economic, socio-cultural, environmental and even demographic); limited capacity (heavy reliance on one or two economic sectors, that are often highly vulnerable to exogenous conditions such as climatic changes and international markets); openness of their economies; high rates of migration (both internal and international) and urbanisation (in most cases to a single urban centre); reliance on current account transfer receipts (remittances and foreign aid); and inflated bureaucracies (Pool, 1992; Bakker, 1992; Fairbairn, 1992; The World Bank, 1996; The World Bank and The Commonwealth Secretariat, 2000; Connell, 1990; Overton, 1993; Levin, 1992; Overton and Thaman, 1999; Bertram and Watters, 1985,1986; Bertram, 1999). All these factors make these countries extremely vulnerable to both external and internal influences – internal effects of population growth and environmental degradation, and external effects of global economic, political and environmental conditions.

While some of these typical island characteristics have a positive effect on their development, such as higher levels of Gross National Product (GNP) and foreign aid per capita than larger developing countries (Ahlburg, 1996), others have negative influences. The negative effects are limited economic capacity due to diseconomies of scale resulting from widely dispersed pockets of population; high population growth rates in the past and thus high levels of young dependency and high population densities (Ahlburg, 1996; Levin, 1992); dearth of natural resources and narrowness of economic base and therefore, limited opportunities for employment (Pool, 1982, 1992; Howlett, 1982; The World Bank and The Commonwealth Secretariat, 2000); weaknesses in public and private sector capacity; and relatively large public sectors and inadequate institutional capacity to attain a strong bargaining

¹ The Pacific islands comprise the largest collection of small island states in the world. They have historical links with the developed countries of Europe and the Pacific Rim and with

position in international finance and trade negotiations (The World Bank and The Commonwealth Secretariat, 2000). Generally speaking, the negative factors seem to outweigh the positive factors.

High rates of urbanisation in these countries are creating problems of congestion, pollution, and associated socio-economic and environmental problems (Pool, 1982, 1992; Pirie, 1995; Campbell, 1993; Storey, 1999). Apart from the severe environmental problems that arise due to the effects of excessive population growth and high population densities on many of these island states (Chung, 1993; South Pacific Commission, 1994; Campbell, 1993; Storey, 1999; Overton and Thaman, 1999), the threats of global climatic change and sea level rise for the mere survival of the many tiny low lying atoll states in the Pacific and Indian Oceans², and the occasional violent storms that severely damage and disrupt livelihoods of their people also add to their developmental problems (Overton and Thaman, 1999).

Maldives shares many of the geographical, economic, and demographic constraints experienced by other small island states. At the same time, in certain aspects, the problems and prospects of development of the Maldives are rather different. Firstly, unlike the Pacific atoll states, the Maldives is physically isolated from any other island state or from any of the developed countries of the world. Secondly, the political history of the Maldives also differs from most other island states of the world, as it lacks a colonial history and hence any of the colonial legacies inherited by other small island countries. Thirdly, and related to the previous point, the Maldives remained a Protectorate under the British from 1887 to 1965 during which time there was no direct involvement in the administration of its internal affairs but Britain took the responsibility of handling its external affairs (The World Bank, 1980; The World Book Multimedia Encyclopedia, 1997). Thus the Maldives lacks an

universities in these countries.

² Maldives is fortunate to be relatively free from natural disasters of the scale that frequently disrupt the other small island states of the world (Ministry of Planning, Human Resources and Environment, 1994; see Fairbairn and Worrell, 1996 for a comparison of the Caribbean and the Pacific islands).

inherited administrative structure. Fourthly, unlike some small island states of the world, Maldives enjoys ethnic and cultural homogeneity of its population. Fifthly, the absence of outside dominance over the Maldives has also meant that 'the country's resources and the means of exploiting them remain firmly enough in Maldivian hands' (The World Bank, 1980:12).

The geographic isolation of the Maldives and the absence of a colonial legacy may probably be the reasons for the absence of significant levels of international migration of its people of the type prevalent in many other small island states, especially those in the Pacific and the Caribbean (see for instance, Fairbairn and Worrell, 1996). Internal migration is a more important factor in the socio-economic development of the Maldives than international migration, a distinction it shares with some western Pacific societies in Melanesia (Walsh, 1982; Hayes, 1993; Friesen, 1993) and with Kiribati³ (Walsh, 1982; Bertram, 1999).

While the international migration of Maldivians has been insignificant up to the present, the number of expatriate workers from regional countries has increased in the Maldivian labour market in the past few decades. This has been caused by the rapid economic developments that the country has seen since the introduction of the tourism⁴ industry in the early 70s and to a lesser extent, the establishment of garment processing factories in the country during the past two decades. At the same time, demand has increased for highly skilled components of the labour force in the social and economic sectors for which the indigenous labour force was in short supply.

In addition, improvements in the economic status of Maldivian families that have brought about drastic changes in the attitudes of the indigenous workforce

³ The closest parallel to the patterns of migration existing in the Maldives may be found in the Pacific island state of Kiribati where rural to urban migration is far more important than international migration, but where remittances made by seamen working on international shipping lines contribute significant amounts of foreign exchange to the local economy (Fairbairn, 1992; World Bank, 1996).

⁴ Since the inception of the tourism industry in the Maldives in 1972, it has grown to be the most important sector of the Maldivian economy; in 1999 there were over 400,000 tourists

towards certain unskilled and menial occupations have created further demands for expatriate labour. While the structure of the Maldivian economy may be quite different from the oil-economies of the Middle Eastern states, this is an aspect where close parallels can be found in the labour demands and modes of supply between the Maldives and the small states of the Middle East, where economic growth and the compositional and attitudinal aspects of the indigenous workforce have prompted large flows of expatriate workers into these countries as well (see for example, Smart, 1986).

In spite of the various disadvantages of its smallness and isolation, it is perhaps these particular characteristics that have facilitated sustained economic growth in the Maldives in the face of rapid population increase in the past three decades. The first World Bank mission to the Maldives highlighted some of the advantages that the Maldives possesses in comparison to other small island states of the world in July 1979:

While the Maldives shares many of the constraints imposed by smallness and remoteness with other island developing countries (IDCs), it is, in some important respects, quite unique...unlike almost all IDCs, the Maldives is neither a colony nor a former colony. Its economic relations with the rest of the world are sufficiently diversified, and it is not dependent politically or economically on one other nation or trading bloc...the Maldives' remoteness from main trade routes is greatly mitigated by the establishment of an effective national shipping line. The Maldives is, therefore relatively unfettered by the most intractable problems facing other small and remote IDCs (The World Bank, 1980:12).

Two decades on, the development experiences of the Maldives were appraised by the United Nations Resident Representative in the Maldives. In his message in the Maldives Vulnerability and Poverty Assessment Report published jointly by the Maldivian Government and the UNDP he stated that,

The rapid development in the Maldives during the last couple of decades has significantly improved the living standards of the people. Virtually all the socio-economic indicators used to measure progress have witnessed consistent and significant improvements to the extent that they

have become exemplary. The Maldives can even be considered as having undergone social and economic transformation (Kakar, 1999).

The key to such progress probably lies in the success of the tourism sector, and improvements in internal transportation linking the rural workforce to employment opportunities elsewhere, more specifically in the urban centred economic growth sectors. Even though progress has been made in macro-level socio-economic development, little factual evidence exists on the extent of the distribution of the benefits of development to the households living in the far-flung islands of the country.

Population pressures in the Maldives are produced by a rapidly growing indigenous population, exacerbated by the significant number of expatriate workers, the heavy inflows of foreign tourists, and rural to urban migration largely for the purposes of better schooling and employment opportunities. These population pressures have inevitably given rise to a host of social, economic, and environmental problems such as, housing congestion in the one urban area⁵ and on the other more densely populated islands, classroom overcrowding in schools, beach erosion, reef destruction, marine pollution due to improper disposal of garbage and sewage, and air and marine pollution due to the increasing land, air and motorised sea traffic.

The rapid growth of the Maldivian population during the past two decades has created a large and growing population of youth, whose arrival in the labour market, threatens to undermine the current socio-economic achievements of the country. However, fortuitously, this growth in the numbers of younger people occurs at a time when the rapidly expanding labour market requires skilled young people in growing numbers. With a high basic literacy rate of over 95 percent, and high values culturally attached to children's education, both at the national level as well as the household level, the foundation for the training of such personnel already exists.

⁵ The only urban area in the Maldives is Male' island, the capital. Since the urban and rural areas are commonly referred to as Male' and the atolls, respectively, in the Maldives, the terms rural and atoll and similarly Male' and urban area, have been used interchangeably in this thesis.

The inextricable link between economic development and population, since its initial recognition by Malthus (1798), has existed at varying levels in economic-demographic literature. The series of modifications to the Malthusian model, after the initial neo-classical propositions of Solow (1956)⁶, has led to the acceptance of the important role of human capital in the link between population and economic development – the new theories of endogenous growth (Ogawa, Jones and Williamson, 1993; Todaro, 1997).

The links between population growth, human capital and development are determined by decisions, or rather actions taken at the micro (family) level. Micro economic theories of fertility provide some clues about these micro-level linkages. To the extent that lower fertility encourages increased opportunities for investments in the human capital of children and the labour force participation of women in the modern sectors, this enhances living conditions at the micro-level, improves the quality of human capital, especially mobilising women, and lead to economic development (Becker, 1960, 1990; Becker and Lewis, 1973; Becker and Tomes, 1976; Schultz and Tomes, 1976; Willis, 1994; Robinson; 1997).

Human capital, thus, plays an important role in the economic development of nations. The role of human capital in development becomes more crucial for a resource scarce nation like the Maldives, where much of the economic development options exist in industries, such as tourism and other service oriented industries.

The successful implementation of national development plans would therefore need, first and foremost, an adequate understanding of the complex micro-level forces that encourage or hinder the development of human capital, especially of children, particularly through the spread of schooling and other human capital inputs such as health care and adequate nutrition for various sectors of the society: rural-urban, male-female, and rich-poor. Thus, micro-level

⁶ The Malthusian model did not consider the effects of technological progress on economic development while the neo-classical approach included it as an exogenous factor. These theories are elaborated in Chapter 3 of this thesis.

interactions within the society are important in both creating the demand for education, and for the supply of human capital required for the growth of the economy at the macro-level. On the other hand, the labour market should guarantee equitable access of the workforce to modern sector employment irrespective of their residence or sex. While some socio-cultural obstacles prevent such equitable access at present, the economic structure offers employment opportunities that exceed the current supply of labour.

Economic growth and increasing educational attainment of the population are prompting slow, but sure changes in the attitudes of families towards sending their daughters to work in the tourism sector, away from their home islands⁷. These changes are likely to increase the aspirations of island families, further encouraging them to provide higher levels of schooling to their children and, to some extent, delay their entry into a marital union, unless familial and societal factors intervene to encourage their early marriage⁸. Even with such intervention it is likely that the employment aspirations of young women will encourage them to delay their first birth and even limit their family size thereby affecting their fertility and thus the rate of population growth.

Such attitudinal changes of the society occur slowly, through the process of social interactions between similar groups in the society (Watkins, 1991; Bongaarts and Watkins, 1996), and probably from the urban elite to the rural elite and from rural elite to the rural communities. Since language is the most important means of transferring ideas, the linguistic and ethnic homogeneity of the Maldivian society provides the vital mediums for the process of interaction and the diffusion of ideas to be more vigorous.

1.2 The Basic Questions

The thesis attempts to explore the following broad questions on the Maldives.

⁷ This observation is based on the findings from qualitative interviews conducted by the author in Mahibadhoo island, Ari Atoll and on the basis of recent developments in Eydhafushi island, South Maalhosmadulu Atoll (Mufeed, 2000).

- 1) What are the trends and differentials in population, human capital, and development (see Table 1-1) at the macro-level in the Maldives?
- 2) What are the interrelationships between population, human capital and development (see Table 1-1) at the micro-level (household)?
- 3) How do the changes in the modern sectors translate across to produce basic economic development across all social, economic and human capital sectors?
- 4) How do the micro-macro and macro-micro links between population, human capital, and development described above interact in the present context?

Table 1-1: Macro and Micro Measures of Population Change, Human Capital and Development as Used in This Thesis

	Macro aspect	Micro aspect
Population change	a) Growth and changes in structure b) Migration flows (including temporary mobility and tourism)	a) Fertility of women b) Mobility
Human capital	Educational demand, and supply and labour	Educational attainment Labour force participation
Economic development	GDP per capita and changes in economic structure	Index of household level of development (IHD) ⁹

With overall rapid economic development the structure of the economy has also changed significantly. During the past three decades there has been a shift in the industrial labour force from primary industry – predominantly fisheries based occupations, towards the tertiary sector – service-based occupations. The service-based occupations are mainly concentrated in, and around the urban

⁸ Early marriage may be encouraged if parents feel that married daughters are less likely to be lured into socio-culturally undesirable activities.

⁹ An index developed by the author for this thesis measuring the level of affluence at the household (micro) level (see Appendix 3 for details).

area¹⁰, and the fisheries based occupations are mainly concentrated in the rural areas. Due to the nature of the fisheries based occupations, such as harshness of the working conditions and probably its association with the uneducated (low social status), people from rural areas are attracted towards the urban area in search of more attractive employment opportunities in tourism, trade, and related sectors.

With the significant presence of expatriates in the Maldivian labour market, the economic benefits (earnings) for the local populations from the growth of sectors such as tourism and the manufacture of garments, may be less than it would have been if Maldivians were able to occupy the skilled occupations in these industries. This is especially likely when such establishments are located physically separate from the inhabited islands or from the local populations of inhabited islands.

Recent economic developments have also been accompanied by social change. These changes have taken place both at the macro-level as well as the micro-level. Understanding the extent of these changes and how they interact between the two levels is essential for informed policy making.

1.3 Structure of the Thesis

The remainder of this thesis is structured into four main parts. Part A comprises three more chapters, with Chapter 2 providing background information on the geography, environment, population, and the economy of the country and its society and culture. A brief picture of development planning, focusing on its historical development, evolution of development concerns over the years, and the place of demographic concerns in development planning in the Maldives are discussed there. Chapter 3 is concerned with the review of existing literature on the relationships between population growth, human capital and development and their interlinkages as relevant to the present research context,

¹⁰ This includes the tourism sector, which had also been concentrated in and around the urban area until 1998 when for the first time new resorts were established in the new tourism zones in

the theoretical rationale of the study, and the analytical framework for the study of these relationships and their macro-micro interactions in the Maldives. Chapter 4 presents the sources of data used in the present thesis with the objective of informing the reader about the limitations of data and how these limitations are dealt with.

Part B comprises six chapters from chapter 5 to chapter 12. This part provides a macro-level analysis of the demographic, economic, and human capital levels, their trends, and differentials in the Maldives. Chapter 5 concerns itself with fertility and family formation including reproductive health. Chapter 6 presents data on the levels and trends of mortality in relation to health and nutrition, as they are important factors affecting the quality and stock of human capital. Chapter 7 concerns internal and international migration in the Maldives. International migration includes the seasonal flow of the large tourist population, the resident expatriate population, and the movements of Maldivian nationals abroad. Chapter 8 analyses the trends in the age structure of the population that are occurring as a result of the past trends in fertility and mortality. Chapter 9 discusses population dynamics and future trends using population projections prepared by the author. The methods used in preparing the projections and the assumptions behind the projections are also presented there. Chapter 10 concerns with itself trends and differentials in human capital development and supply in the Maldives, and on the basis of projections, discusses the demand and supply aspects of the future human capital in the country and their likely implications. Chapter 11 is concerned with the trends in the growth of the economy and its compositional changes. Chapter 12 is a macro-level synthesis of the findings on macro-level relationships between population, human capital, and development observed from all the chapters presented in Part B.

An analysis of interlinkages at the micro-level will be the focus of Part C. This part comprises five chapters. Chapter 13, the first in this part describes the

the atolls outside the urban periphery. However, since the empirical analysis in this thesis covers only up to 1995, these developments are not dealt with in the present study.

analytical variables used in the micro-level analysis and specifies the methodology adopted in the analysis. Chapter 14 describes at the micro-level the individual and household level socio-economic and demographic factors associated with fertility of women. Chapter 15 presents the independent effects of household socio-economic factors on schooling of secondary and higher secondary school aged children in households. Chapter 16 discusses the independent effects of household socio-economic factors on employment at the individual level. Index of household level of development (IHD) is taken as the dependent variable in Chapter 17 in order to study the independent effects of individual, household, and community level factors on household development in the Maldives. Chapter 18 presents a synthesis of the findings of the micro-level interlinkages between human capital, fertility and development in the Maldives.

Part D contains two chapters. Chapter 19 provides a synthesis of the findings at the macro-level and the micro-level, and their interlinkages between human capital, fertility, and development. It also attempts to present the macro-micro and micro-macro interactions between these factors in the Maldivian context and suggests possible implications of these interactions for the socio-economic development of the Maldives. A summary of the findings and suggestions of some implications and directions for future research in this area are also provided. On the basis of the findings of this thesis, this chapter concludes the thesis by proposing some policy implications.

Chapter 2: Background

This chapter presents background information on the geography, population, the physical and human environment, the economy and the society of the Maldives. It also outlines the introduction and evolution of the development planning in the Maldives, looking at the changing themes of successive plans and how the issue of population was incorporated in the various National Development Plans to date. The purpose of the chapter is to provide the broader context of the study population.

2.1 Geography

The Republic of Maldives is the only archipelago state in the region of South Asia. Geologically, the Maldives is part of the 1,600 kilometre long chain of islands of the Laccadive-Chagos submarine ridge, extending south in the Indian Ocean from the south-west coast of the Indian sub-continent (Ministry of Planning, Human Resources and Environment, 1998). Located 600 kilometres south of the southernmost point of India, the long chain of 26 natural atolls¹¹ stretches from north to south across the equator. The major part of the archipelago lies north of the equator, extending up to 7 degrees 6 minutes north and the southern end only 41 minutes below the equator line. The distance from the southern-most point to the northern-most point is 820 kilometres, and the breadth at the widest part of the archipelago only 130 kilometres. It consists of 1190 small islands scattered almost evenly over the entire area of its territorial waters, with a combined land area of only about two to three hundred square kilometres¹² (see Maps I and II).

The Exclusive Economic Zone (EEZ) of the Maldives extends over an area of about one million square kilometres. For administrative purposes, the 26 natural atolls of the Maldives have been classified into 19 groups, each of

¹¹ In the Maldives, an administrative division is also referred to as an atoll.

¹² The total land area reported in some documents is 298 square kilometres. However, recent investigations reveal a much smaller total land area (Hanson, 1993; unpublished). To the knowledge of the author, a confirmed figure is not available as yet.

which is referred to as an 'administrative atoll' (Government of Maldives, 1994).

The islands are low lying, with an average elevation of 1.6 metres above mean sea level. Few of the islands have a land area in excess of one square kilometre and only 200 are inhabited. Another 80 odd islands are used either as tourist resorts, or for industrial purposes. The capital island – Male', with an area of about 2 square kilometres, accommodates 25 percent of the country's population of a quarter of a million (Ministry of Planning and Environment, 1991).

The climate is tropical – warm and humid, with two pronounced monsoon seasons. Daily temperatures vary little throughout the year. The mean annual temperature is 28° Celsius, with a maximum average of 32° Celsius and a minimum average of 25° Celsius. Relative humidity ranges from 73 percent to 85 percent (Government of Maldives, 1994). Average annual rainfall in the period 1989 to 1993 was 1870 millimetres. Monthly average variations in rainfall are significant, ranging from 12.3 millimetres in February to 250 millimetres in May. Only an estimated 10 percent of the total combined land area is suitable for agriculture (Ministry of Planning, Human Resources and Environment, 1996).

2.2 Population

At the beginning of the 20th century, the population of Maldives was around 70,000. It took about 60 years to double in size to 140,000 during the mid 1970s (Ministry of Planning and Development, 1987). This slow growth may be attributed to the prevalence of killer diseases such as malaria, water-borne diseases such as diarrhoea, other communicable and non-communicable diseases in the past, and even due to mortality from famine during the early part of the 20th century (Department of Census and Statistics, 1979). The concept of prevention was virtually unknown and remedial measures were limited to the ingenuity of the local 'medicine man'. As a result, mortality rates, especially infant and child mortality rates, were extremely high. See for

example an early report by the explorer Pyrard (Gray, 1890). The earliest available record of death statistics dates back to 1977, when infant mortality was reported to be 127 per thousand live births (National Planning Agency, 1980).

High mortality was not only caused by non-availability of 'modern' medicine and unhygienic lifestyles, although these factors played a major part in the causality process. Factors such as the accessibility of health care, awareness and attitudes towards nutrition, prevention and modern medical care were also contributing factors. Of special significance to mortality decline is the relevance of these factors in relation to the status of women (Caldwell, 1986; Frenk *et al.*, 1989; Kirk, 1996).

Recent improvements in health service provision and awareness has led to a rapid decline in mortality, especially at the very early ages. The primary health care approach adopted by the government, after the Alma Ata Declaration¹³ has led to, among other improvements in the social development of the Maldives, a rapid decline in infant mortality to around 34 in 1994. However, birth rates have remained high, with a TFR (total fertility rate) of over five children per woman during the 1980s and early 1990s (Ministry of Planning, Human Resources and Environment, 1994). This has resulted in a rapidly growing population, with a growth rate of around 3 percent per annum. Due to the rapidly declining mortality and sustained high fertility, the present day population of the Maldives is very young, with about 47 percent under the age of 15 years.

According to the census of 1995, there were 214,813 persons (excluding the resident expatriates and tourists) in the Maldives. Recent official projections of the population indicate that the indigenous population of the Maldives will be

¹³ The Alma Ata Declaration endorsed by the member states of the World Health Organisation, at the World Health Assembly held at Alma Ata, Kazakhstan, 1978. This is considered a major milestone in health care improvement due to the commitment by the member states to adopt and implement "Primary Health Care and Health for All by the Year 2000". (Ministry of Health and Welfare, 1995).

close to 300,000 at the turn of the century (Ministry of Planning, Human Resources and Environment, 1998). This translates to a population density of roughly 1006 persons per square kilometre assuming that the land area of 298 square kilometres is correct. This compares with 146 persons per square kilometre in Micronesia, which has some of the most crowded islands of the Pacific (South Pacific Commission, 1994).

The age structural imbalances that are caused by the rapid growth of the population are imposing heavy burden on the social and economic development efforts of the nation. The extremely high dependency burden of 0.94¹⁴ (1995 census) may be seen as a major obstacle for sustaining the present development trends in the country. Optimistically viewed, however, the present age structure provides valuable input for the present as well as for the future development of this small nation of islands – an adequately skilled workforce.

In addition to the growth of the indigenous population, rapid growths have been experienced in the number of expatriates in the Maldivian labour market. The growth of this component of the population has been caused by a rapidly growing economy, mainly in the tourism and related sectors, and increase in the demand for social services, mainly in the areas of education and health care, creating a deficit of both skilled and unskilled workers in the labour market. Lifestyles of the Maldivians, labour intensive establishments, and lack of concern over the rapid growth in the expatriate labour force, are also likely factors that have contributed to the growth of the expatriate labour force in the country.

High growth rates and the resulting structural imbalances are not the only population problem faced by the Maldives. Like other small island states, the Maldives also faces the problem of providing socio-economic services to a widely scattered population. In most islands the populations are so sparse that

¹⁴ Population aged less than 15 and 65 and over, expressed as a proportion of the population aged 15 to 64

any form of socio-economic activity will not be viable. In other islands the populations are so congested that severe environmental problems (including health and social) are virtually inevitable. The nation's capital Male', being the only urban centre in the country and the hub of the national economy, contains over one quarter of the total population of the country, excluding the large expatriate population and visitors (see Chapter 10).

2.3 Physical and Human Environment

The atolls of the Maldives comprise one of the most fragile ecosystems in the world. They stand extremely vulnerable to the potential effects of climatic changes and to the effects of a rapidly growing population. Other small island countries with parallel environmental problems with the Maldives lie in the Pacific, namely; Kiribati, Marshall Islands and Tuvalu (Campbell, J., 1993; Overton and Thaman, 1999).

Apart from climatic change, the effects of a rapidly growing population pose an equally severe threat to the delicate environment of these islands. Characteristic to atoll eco-systems, Maldives is severely lacking in land-based resources. An acute shortage of cultivable land area has been further constrained by the growing population (Ministry of Planning, Human Resources and Environment, 1994). Overuse of the fresh water aquifer for drinking, bathing, and irrigation, in increasing quantities by the growing population has resulted in salt-water intrusion leading to few alternatives but to invest considerable amounts in setting up a seawater desalination and distribution system in Male', where the effects of population growth on the fresh water aquifer is the worst. There are several other islands in the country that are rapidly reaching similar conditions (Campbell, J., 1993).

An equally serious environmental problem facing the Maldives as in many other small island states is the problem of waste disposal. Both solid waste and sewage generation is increasing with the population growth, creating major problems in the main population centres of the country. Male' alone generates over 56 tons of solid waste each day (Ministry of Planning, Human Resources

and Environment, 1998). It is not only the quantity of waste that are posing environmental problems. With the changes in the lifestyle of the people that has occurred as a result of development, the household and industrial pollutant content of the solid waste has also increased.

Another major effect of the growing population on the island ecosystem is deforestation. It is caused by clearing of wooded areas of islands to make way for housing, cultivation, and firewood. In some islands including Male', all available land has been exhausted for housing and further land is being reclaimed from the surrounding lagoon.

The adverse effects of land reclamation has been most vividly experienced in Male' during periodic storms that have occurred in the Maldives in the recent years. Based of a study of historical records, Ministry of Planning, Human Resources and Environment (1998) found that the effects of land reclamation, and poorly designed sea walls and other coastal structures have actually magnified the effects of these storms on the environment.

A significant factor often ignored in the studies of the delicate link between the population and atoll environment of the Maldives is the large seasonal population of international tourist arrivals to the Maldives. Although tourists are largely secluded on purpose-built tourist resorts as mentioned in Chapter 1, their immediate actions, such as snorkelling, diving, and fishing and indirect factors that are beyond their control, but ensuing from their stay in the resorts, such as waste disposal, pollution caused by motorised boats and aircraft movements also increase with the growth in tourist arrivals. Physical evidence of the negative effects of tourism growth on the coastal environment is already visible in many tourist resorts in the Maldives (Domroes, 1993:80).

Besides the temporary population of tourists, expatriate workers are causing more direct impacts on the living environment of the local population through their pressures on housing, health and recreational facilities, and on water, sewage, and waste disposal systems. While many expatriates are employed in the tourism sector and thus reside in the resorts, significant numbers of

expatriates employed in other sectors reside in Male' island and few in other inhabited islands.

2.4 Economy

Throughout its recorded history, the Maldives has managed to remain self-governing, except for one brief spell of Portuguese rule during the 16th century. The Maldives became a British protectorate in 1887, but there was no British presence in Male'. Maldives attained independence and became a member of the United Nations in 1965. It became a member of the International Monetary Fund and the World Bank in January 1978 (Ministry of Information, Arts and Culture, 2000).

The first World Bank economic mission that visited the Maldives in July 1979 observed that the Maldives was among the 20 poorest countries in the world, with a narrow economic base in relation to its population and lacking any known mineral resources, like most island developing countries (IDCs) (World Bank, 1980). Even among the island nations of the world, the Maldives was identified by the General Assembly of the United Nations in 1974, as among the poorest, and in need of special assistance. The World Bank mission also observed that even at that time the Maldives was included among the world's most densely populated islands, 'comparable with Bahrain, Barbados, and Mauritius, but less than half the densities of Bermuda or Malta, and one-eighth of Singapore's' (The World Bank, 1980:13). The estimated Gross National Product (GNP) per capita in 1978 was around US \$160, which was the lowest of all IDCs compared with the Maldives by the World Bank with the GNP per capita in Comoros in 1978 was US\$180, in Sri Lanka US\$190, in Madagascar US\$250, and in the Seychelles US\$1,060 (The World Bank, 1980).

The Maldivian economy is supported by three major sectors: Fisheries, tourism, and international shipping. Among these, fisheries have constituted the life-blood of the Maldivian peoples since time immemorial. However, tourism has become the fastest growing sector since its introduction in the Maldives in 1972. In contrast, international shipping, which made a significant

contribution previously, went through a period of rapid decline. That said, international shipping remains crucial to the nation's economy since the country's freight imbalance between exports and imports would place it at an extreme disadvantage if it were to depend on external shipping.

Traditionally, the Maldivian economy depended largely on fisheries, the only form of export being dried and smoked tuna – more popularly known as 'Maldivian Fish'. Sri Lanka used to be the only market for Maldivian fish exports until 1971, when the former began to limit its purchases. As a result of the Sri Lankan restrictions the country was somehow forced to shift its exports to fresh fish in the form of deliveries to foreign fishing and processing vessels operating in the Maldives. With the withdrawal of those foreign companies during 1982-1983, the government purchased the equipment and took over the operation.

The traditional fishing industry is based on near-shore (30 miles) and pelagic surface fishing for tuna and tuna varieties. The method of fishing is by using pole and line with live bait. The catch potentials of the rest of the 200 mile EEZ remains still largely untapped by Maldivian boats, although long line fishing using larger and more powerful boats are being introduced now (National Development Plans, various years).

The traditional fishing craft were sail powered *dhonis* (locally crafted fishing boats). The fishing boat mechanisation programme initiated by the government in 1974 was aimed at enhancing the capacity and range of these sail powered *dhonis*. The mechanisation programme proved to be extremely popular and successful. As the greater efficiency of the mechanised boats became known the sailing vessels gradually disappeared. Today, with the help of government assistance, more and more larger fishing *dhonis* have been introduced into the fishing fleet. By giving careful attention to retain the originality of the fishing *dhoni*, many modifications have been made over the past couple of decades in order to make the *dhoni* more compatible with the modern day needs of the local fishermen. Some of these are equipped with

sophisticated communication and navigation equipment to enable them to travel greater distances (Latheef and Naseer, 1999).

The fishing industry itself has gone through some major changes. Traditionally, the only form of fish preparation for export was 'Maldivian fish' prepared by the families of fishermen, where men do the catching, cleaning and cutting while women do the boiling and drying. Today, however, fish is marketed in different forms. In many cases, the daily catch is sold fresh to collecting vessels or to cold storage plants for transfer to the fish-canning factory operated by the public sector. Preparation of 'Maldivian Fish' has also largely moved out of the family domain to more established processing centres. Most fishermen prefer to sell their catch to these establishments rather than doing the hard work of cleaning and processing within their families, because it gives them ready access to cash while saving them more time to attend to other things.

The tourism industry in the Maldives, which was established in 1972, has grown rapidly since its very inception, to become the leading source of foreign exchange into the country. Tourism has created numerous other opportunities for the creation of wealth (e.g. wholesale and retail trade, inter-island and international transport and shipping, and telecommunications) in the Maldives within the past three decades.

Two important features characterise the introduction and growth of tourism in the Maldives. Firstly, from the very beginning all tourist hotels are built as island resorts on uninhabited islands, physically separated from the local communities. The second feature is that most of these tourist resorts are owned and operated by Maldivians (Ministry of Tourism, 1998).

The fact that tourist resorts have been kept away from the local communities has been seen to minimise the negative effects of large-scale tourism experienced by other tourism-oriented countries (Ministry of Tourism, 1998). While its cultural impacts may have been minimised through this approach, the

environmental impacts of the large annual numbers of visitors cannot be ignored.

In the absence of a population large enough to create economies of scale, the presence of a large seasonal population of mainly European, but also significant numbers of Japanese tourists in the country has helped to create a booming trade sector. It has also been beneficial for the general population, as it has enabled businesses to sell certain items such as imported foods and construction materials at low per capita costs than would have been possible otherwise.

The modernisation of the fisheries sector, the growth of tourism and supporting sectors appear to have brought about significant changes in the socio-economic structure of the population of Maldives. Most of the tourism and related sectors have developed in and around Male' island, by virtue of it being the nation's capital and the only urban centre. This has resulted in creating; i) an integrated modern sector in Male' island; ii) a segregated modern sector in tourist resorts and industrial islands; iii) and a more or less traditional sector, albeit the advancements made in the fishing fleet, in most of the other inhabited islands of the country.

2.5 Society and Culture

2.5.1 Religion and Language

Believed to have been settled by Aryan immigrants from India and Sri Lanka in the 4th and 5th centuries B.C., the ancient Maldives consisted of a Buddhist population (The World Bank, 1980; Heyerdahl, 1988). Islam was accepted as the official religion during the period 1153 – 1154 A.D through the influence of Arab merchants over time (Hakluyt Society, 1994). Today, common bonds of religion and language unify the people of the Maldives. Islamic faith can be said to be the single most important cultural influence in the Maldives with strong influence on the structure of economic, social, and political relationships within the population.

Dhivehi, the language of the Maldivian people, has its origins in the Indo-Aryan family of languages. However, it has been strongly influenced by Arabic, Urdu, Hindi, Persian, Sinhalese, Tamil, and more recently, English. Dhivehi is written in the *Thaana* script, which was introduced in the late 14th century and is unique to the Maldives (National Centre for Linguistic and Historical Research, 1998, unpublished data). It is based on the Arabic alphabet and written from right to left. Although there are some variations in the colloquial aspects of the language between some islands and atolls, the written language is uniform throughout the country.

2.5.2 Family Systems and Family Roles

In the past and even today, the family has been the basic unit of the Maldivian society. The Maldivian society is based on a strong extended family system that supports its members during hard times and provides security for the disabled and the elderly. The responsibilities of each member of the family in attending to the welfare of the other members of the extended family are firmly rooted in the value system based on religious teachings, and shaped by the nature of communities that is typical of small island societies.

Marriage has been, and remains to be, virtually universal in the Maldivian society. The traditional system encourages early marriage, as childbearing outside marriage is a punishable offence under the Islamic Law. 'The same customs that encourage early marriage and childbearing also make divorce relatively easy... Maldivian men seem to have taken full advantage of the ease of divorce and remarriage permitted by Islamic Law' (National Planning Agency, 1980). As a result, Maldives has one of the highest divorce rates in the world. However, recent data indicate that the divorce and remarriage rates may be declining (Ministry of Planning, Human Resources and Environment, 1996).

Frequent remarriages and high fertility result in a woman having children by more than one husband during her lifetime. 'The resultant maze of relationships among parents, children, in-laws, and cousins is a complex one'

(National Planning Agency, 1980). With the declining divorce and remarriage rates it is expected that the complexity of this maze will become clearer. The process has already begun within a span of three generations. Today's families, both urban and rural are less complex than the families of their grandparents (author's own observations).

In many large families, where parents or the income provider becomes too old to earn an income that is enough to support the family, grown up children in the family are expected to support, or in some cases even take-over the full responsibility of taking care of their smaller siblings, and their elderly parents. This is a phenomenon that has also been observed in some other developing countries (see for example, Hossain, 1990).

2.5.3 Social Structure

Historically, Maldivian society has been structured into three social levels: the nobility, which has its origins in the families of various Sultans and Sultanas that have ruled the country throughout its history and the senior officials of the palace; other government officials and the educated persons who do not fall into the previous category; the ordinary public who hold the lower level jobs in the government and those who are employed elsewhere or self-employed. In the inhabited islands outside Male', on the other hand, social stratification was minimal where wealth was the sole determinant of the status, except in the capitals of the atolls where the Atoll Chief holds a high social status.

There were various customs that were maintained and regulations made to impose upon the people to observe the different social classes to which they belong. There was a time when people of the ordinary classes were not permitted to wear a shirt or shoes in public. These regulations and restrictions are non-existent today but social distance is still maintained through the language, which has three levels that use special nouns, pre-fixes and forms of address to distinguish the different social levels (National Planning Agency, 1980). However, with the effect of the growing numbers of wealthy among the

rural to urban migrants, the extent of the distinction between the different social groups has also become much diluted.

Today, in Male', as in the rest of the inhabited islands, status is based mostly on wealth and position, rather than anything else. One's position in the government and one's education still play a dominant role in assigning social status. In the islands other than Male', education probably plays a larger role in determining an individual's social status and influence in the community.

Rapid population growth, changes to the economic structure, and the resulting rural to urban migration have perhaps been the most important factors in the diminishing significance of class¹⁵ differences in the Maldives in the recent years. The reason for such rapid changes may be that the islands are virtually classless and that the increasing numbers of rural to urban migrants meant that the numbers of elite in Male' were too small to maintain their clear-cut distinction (National Planning Agency, 1980). In addition to this, the new wants and needs created by the rapid economic growth have opened up new opportunities for the creation of sizable wealth for the entire population, affecting the aspirations of all Maldivians.

These aspirations have led to many Maldivians particularly those from the inhabited islands outside Male', taking full advantage of the new economic opportunities that are opening up in the country. Today, the high economic mobility that exists in the country provides further incentives for people from every corner of the society to dream, and to pursue them with confidence that their dreams are achievable.

2.6 Development Planning in the Maldives

2.6.1 The History of Planning

Similar to all other aspects of socio-economic development in the Maldives, it lacks an inherited system of development planning from a colonial power that

15 As in nobility, working class, and the peasants.

many other developing countries of the world have. The first attempt to establish a system of planned development was a short-lived effort made in the early fifties. This was followed by a period of unplanned development based on ad-hoc policies.

Although much of the ground work for the current socio-economic structure – introduction of tourism; mechanisation of the fishing fleet; establishment of a national shipping line; establishment of the international airport; establishment of international satellite communications; introduction of English medium schooling; and opening of community schools in the islands outside Male’ – appear to have occurred during the 1960s and the 1970s (Ministry of Tourism, 1998; The World Bank, 1980; Dhiraagu, 1999; Ministry of Education, 1995), it was not until 1985 that planned development was reinstated. The first of the present series of development plans, launched in 1985, covered a three-year period from 1985 to 1987. This marked the beginning of the series of development plans that continues to guide the nation in its path of social and economic development since 1985.

2.6.2 Major Developmental Concerns and Strategies

Since the rejuvenation of development planning, five three-year development plans have been launched. For the purpose of this thesis, discussion of the major developmental concerns and strategies highlighted in the national development plans will not take into account the first plan since it was ‘more a policy statement than an integrated development plan’ (Ministry of Planning and Development, 1985). The series of plans, which began in 1985, set forth objectives that remained more or less consistent throughout until the fifth national development plan (1997-2000). The fifth plan sets out three new main objectives in addition to the three objectives that have commonly featured in the four previous plans.

The major objectives of the first four plans were: i) to secure sustainable improvements in the living standards and quality of life of the population; ii) to achieve equitable distribution of the national income; and iii) to promote

greater national self reliance, which is essential for future growth. The fifth plan, in addition to these, also included the following objectives: iv) to ensure the sustainability of physical and natural resources by appropriate development and sound management; v) to ensure good governance by effective executive government; and vi) to strengthen national unity and social cohesiveness based on shared social, cultural, and religious beliefs.

Development priorities that were set out in the first plan (1985 – 1987) covered five main areas; raising the level of social and economic development, improving the spread of the benefits of social and economic development, accelerated atoll development to attain balanced growth, relieving urban congestion, and protecting the environment. As these areas continued to be priority ones over the next development cycle, the need to emphasise the importance of human resources development as the basis for all development activities also became recognised. Although measures to address some population problems such as urban congestion appeared as priority areas in the first two plans, the reduction of population growth in its own right gained priority for the first time in the third plan (1991-1993).

The third national development plan (1991-1993) also spells out more specific areas that required some degree of priority in development planning. Briefly outlined, these areas are: the diversification of the revenue base, diversifying and increasing the productivity of the economy, the creation of financial and legal conditions required to promote foreign investment, improved efficiency of the civil service by training and reorganisation, the establishment of new financial institutions required to accelerate the process of social and economic development and to ensure the availability of development finance, and improved access to, and quality of, basic social services such as education, health care, safe water, and sanitation. The fourth national development plan (1994-1996), in addition to the continuing themes from the previous plans, identifies the following: Incentives for the private mobilisation of savings and investment, the improvement of the efficiency of public utilities and moves towards cost recovery and improve participation in, and benefits from,

development for the working age population, especially women, youth and the underprivileged as priority areas.

In addition to the major priorities set out in the fourth plan, planned human settlement is set forth as a priority area in the fifth national development plan, which covers the period from 1997-2000. The planned settlement of the population consists of reclaiming additional land from the lagoons of islands with high population densities, where the environmental impact of such reclamation is minimal, resettlement of the entire population of small but densely populated islands in larger and sparsely populated islands and/or consolidation of the populations of inhabited islands to create a lesser number of islands with economically feasible population sizes. It also includes plans for the establishment of regional growth centres, and creation and management of the growth of an artificial island, Hulhumale', in the lagoon of Hulhule island adjacent to Male' island.

In summary, the national development plans in the past continued to emphasise social and economic development of the peoples in ways that are progressive, just, equitable, and sustainable. The stated strategies for achieving these development objectives have been through the reduction of population growth, sustained economic development, development of regional urban centres, development and management of human resources, strengthened legal, regulatory and justice systems, sound management of the environment, planned human settlement, and by the provision of institutional capacity to provide the services needed for achieving these at the national and regional level.

Significant economic progress has been made since the first plan was launched in 1985. However, high-income activities such as tourism, the most vibrant sector of the economy, being centred on Male' atoll, continue to hinder easy access to employment opportunities for the majority of the population living outside Male' atoll. Outside of tourist resort employment, virtually all employment opportunities other than those in the fisheries sector have been located in the urban area, and for the rural populations, gaining access to these opportunities means spending long periods of time away from their home

islands and from their families. This would mean that most rural populations would have to go through considerable hardships in comparison with the urban populations in order to benefit from the national economic development. Little has changed in this respect during the two decades of planned development. However, it should be appreciated that under the second tourism master plan (Ministry of Tourism, 1998), new tourism zones are being opened in the outer atolls, which would reduce urban rural disparities in access to modern sector employment.

The economy continues to rely on tourism and fisheries for most of its foreign exchange needs. Although rural based industries such as garments factories has been set up in selected areas of the country, past experience has shown that such activities which require long periods of work away from home are not suitable for Maldivian women. Thus, such ventures provide little benefit for the local island communities. In spite of such experiences the government continues to encourage foreign investors to set up garments factories in the inhabited islands of the country leading to increase in the numbers of expatriate workers and adding to the problems of population densities in these islands. While the benefits derived to the national economy and the local population from such ventures may be marginal, the investors are able to take advantage of the largely unexploited national quota in the international export markets.

The rate of expansion of the tourism industry in the Maldives is likely to impose strains on the delicate marine environment of the country. Several steps have been taken by the government to protect the marine environment and the reefs from destruction, such as the banning of the use of spear fishing, export of black coral and products of tortoise shell, and declaring several areas of the country as protected areas. Catching of turtles has also been restricted. However, large scale land reclamation projects in the outlying islands and in Male' atoll, without adequate consideration of their impacts on the surrounding environment continues to threaten the delicate balance between population growth and the environment in the Maldives.

Having avoided the opening up of the Exclusive Economic Zone (EEZ) of the country for licensed fisheries, by overseas fishing companies, for a long time, the government has recently started issuing such licenses. While such licenses provide only marginal benefit for the national economy, and virtually none to the local communities, it is likely that they will lead to the depletion of the fish stock in the Maldivian waters, as cheating on quotas has been recognised as a widespread problem in other countries with better monitoring and surveillance facilities (see for example: Humboldt State University, 2000).

Atoll development or rural development in the Maldives has been mainly in the form of provision of administrative, health, and educational facilities and other social infrastructure by the government. Economic infrastructure such as adequate harbour facilities, communication and transport are also being provided. The high costs of provision of such facilities to the widely dispersed population prove to be a major factor in their inequitable access.

With continuing inequalities between Male' island and the other inhabited islands, urban congestion has increased over the years. Measures to deal with the growth of the urban population by upgrading urban amenities results in increased rural to urban migration – a factor which has significantly contributed to the growth of the population of Male' island. This is a phenomenon that is quite typical of small island states (Pool, 1982). The development of regional growth centres, the creation of larger population centres in some of the outer islands, and the development of Hulhumale' artificial island are likely to alleviate the problem of congestion in Male' island to some extent in the foreseeable future.

2.6.3 Integration of Population in National Development Planning

Concern over population problems and strategies for dealing with these have featured since the re-instatement of the national development planning in 1985. In the earlier plans, the issue of population growth was not as evident as it has been in the 1990s. However, matters such as the unacceptably high infant and

childhood death rates and maternal mortality rates were featured as crucial issues, in need of urgent attention.

The socio-economic gap between the urban and rural areas leading to heavy flows of migration from the rural atolls to Male' island, and the resulting congestion in Male' island was another area of concern that featured highly in the development objectives. Several strategies have been formulated to alleviate this problem over the years. Most of these have been dropped due to lack of practicability. A probable reason for the failure of such projects may be the lack of adequate groundwork before they were finalised but more importantly, it is the continuous improvement of services and the development of new services in Male' island as compared to the rest of the islands which has continued to attract rural to urban migrants.

With the declines in infant and childhood mortality rates the population growth rate began to increase and the pressures on social infrastructure, most vividly seen in the ever-increasing numbers of school age population groups, skyrocketed, and the issue of population growth became more visible to the planners and policy makers of the country. This, together with the pressures from multilateral agencies such as the United Nations Population Fund (UNFPA) prompted the government to overtly address the country's population problems in its Development Plans.

Recent plans have quite explicitly stated that population growth needs to be reduced in order for the country to be able to achieve sustainable development. National development plans in the Maldives have taken adequate account of population issues in the forms of achieving higher levels of economic growth in a more equitable manner and provision of basic education and training and health services equitably to the various sections of the population. The fifth national development plan (1997-2000) has reasonably well endogenised the issues of population into policy. However, in reality, several conflicting policies still exist. For instance, in the allocation of housing priority is given to families with more children; and the allocation of senior administrative staff in island offices is based on the population size of the island, prompting negative

attitudes towards fertility control among some island communities, which is exacerbated by the bureaucratic elite of islands, who covertly propagate against fertility control (author's own observations).

Mention should be made about the significant policy changes that have also been made in order to address the issues of population growth and urban congestion. At the same time, measures are also being taken to consolidate small populations from economically and ecologically unfeasible inhabited islands to create larger populations on islands that offer more scope for development. The present approach where the government fully subsidises the entire cost of moving families from one island to the other, including the cost of new housing, transport, and even the number of coconut trees that individuals had to leave behind, is extremely costly and most unsustainable¹⁶.

The human capital development programmes outlined in the development plans appear to be more successfully implemented from one plan period to the next. It is probably the recognition that development of human capital is the only way that economic development can be sustained and diversified, which has persuaded the government to seriously embark on its human capital development programmes.

In 1999, the government outlined a long-term 'vision' of national development. Human capital development, equitable socio-economic development, and protection of the environment are some of the key features of the "Vision 2020" which was proclaimed by the President of Maldives on 26 July 1999 (Haveeru News Service, 1999). However, it does not specify any optimum population targets.

Having reviewed the particular context in which the relationship between population, human capital and development is explored in the present thesis, The objective of the next chapter is to discuss the theoretical perspectives that underpin these relationships in the broader context.

¹⁶ Based on news articles published on various issues of Haveeru Daily Online (<http://www.haveeru.com.mv>).

Chapter 3: Review of Literature and Analytical Framework

3.1 Review of Literature

The relationships between population, human capital, and development are complex and thus difficult to untangle empirically in a manner that would provide specific answers. While it is likely to be an arduous, if not an impossible task to find clear theoretical links between population, human capital and development, numerous authors have made various propositions providing valuable clues to their interlinkages. An attempt is made in this section to provide a synthesis of the literature on the links between population, human capital and development.

3.1.1 Macro-level Linkages between Population and Development

Economic development literature traces the earliest formal interests on the relationship between population and development to Thomas Robert Malthus (1798). His grim picture of the relationship between these two processes stated that food is a finite resource and that population grows infinitely until mortality is caused by war, disease, and famine, and that the only way to avoid such disaster is to practise 'moral restraint' (sexual abstinence). The Malthusian model did not consider technological progress as a function of economic growth. In contrast, the neoclassical theories of economic growth pioneered by Solow (1956) included, in addition to labour, exogenous technological progress in the model (Willis, 1994). Although the Malthusian model has long been rejected in favour of neoclassical theories, 'the analytic structures of these two models are quite close and many of their implications remain quite similar' (Becker, 1988).

The inadequacy of the neoclassical theories, to explain the determinants of technological change and the large differences in residuals¹⁷ across countries

¹⁷ The residual category in the Solow type model is the component of growth in GNP that cannot be assigned to adjustments in stocks of either labour or capital. This residual category accounts for about half of historical growth in industrialised nations (Blanchard and Fisher, 1989 cited from Todaro, 1997:91).

with similar technological capabilities, led to the development of the new theories of economic growth which treat the rate of technological advance as an endogenous factor that can be enhanced through human capital accumulation (Frank, 1960; Romer, 1986; Lucas, 1988; Mankiw *et al.*, 1992; Todaro, 1997; See also Galor and Weil, 1999), 'through formal schooling or through informal skill development on-the-job' (Ogawa, Jones and Williamson, 1993: 3).

These new theories also stress that the rate of physical capital accumulation is an increasing function of the quality of human capital (Willis, 1994). If human to physical capital ratios are initially high, a country's subsequent economic performance will feature high rates of physical capital investment and rapid per capita income growth (Ogawa, Jones and Williamson, 1993; Basu, 1997). The observations made by Barro (1991:437) in his analysis of economic growth in a cross-section of countries during the period 1960 to 1985 provide evidence to the point. He concludes that, "...given the level of initial per capita GDP, the growth rate is substantially positively related to the starting amount of human capital". Thus schooling levels have been identified as being the key to the spectacular economic growth in Pacific Rim countries of East and South-east Asia (Ogawa, Jones and Williamson, 1993). Cassen (1994) also argues that, at the macro-level, the relationship between population and economic development depends much on circumstances. As he concludes, 'countries that are able to educate, train, and employ the high proportion of young population that has resulted from high fertility, while keeping them well nourished and healthy, are the countries that are at an advantage' (Cassen, 1994:20).

Unlike the old theories of economic growth, the new endogenous theories of growth do not assume diminishing returns to capital. Rather, 'investments in physical and human capital are assumed to be able to generate external economies and productivity improvements that exceed private gains sufficient enough to offset diminishing returns, which leads to sustained long term growth resulting from increasing returns to scale' (Todaro, 1997:92, see also Romer, 1986). Another important feature that distinguishes the new growth models from the neoclassical models is the vital role that governments are

encouraged to play in economic development. Government's involvement in economic development is important in the provision of direct and indirect investments in the development of human capital, and by attracting and channelling foreign private investment towards human capital intensive industries such as computer software and telecommunications (Todaro, 1997).

The new growth theories, although still at a formative stage, are providing significant insights to knowledge on the processes of development (Todaro, 1997; Agenor and Montiel, 1996). Considerable empirical evidence exists in support of the importance of human capital development for the economic growth of nations. For instance, Denison (1985) found that the growth in years of schooling explained about 26 percent of the growth in U.S. per capita income during the period 1929 and 1982. Barro (1991), using data from a cross section of developed and developing countries totalling 98, for the period 1960 to 1985, found that investments in education were important in explaining subsequent growth in per capita incomes. Barro concludes that,

...given the level of initial per capita GDP, the growth rate is substantially positively related to the starting amount of human capital. Thus, poor countries tend to catch up with rich countries if the poor countries with high human capital have low fertility rates and high ratios of physical investment to GDP (Barro, 1991:437).

The development experiences of East Asian countries provide the most discernible evidence of the importance of human capital for economic development providing support to the new endogenous theories of economic growth, the roles of human capital investments and state intervention in the development process (Ogawa, Jones and Williamson, 1993; Rao, 1998; Stevenson, 1998; Rowen, 1998). Scholars interested in the economic-demographic context of development have focused on the ability of the nations of South-East Asia on the Pacific Rim, to break away from a least-developed situation and to set themselves clearly and surely on the path towards industrialisation and rapid development. The main focus of their research seems to converge on the role of human capital in providing the initial development input and the high priority given to human capital development, both at the family level and at the national policy level, in subsequently

fuelling the rapid economic development of these countries during the past 20 to 30 years (Jones, 1993; Ogawa, Jones and Williamson, 1993; Robinson, 1993; Rowen, 1998; Stevenson, 1998; Rao, 1998; Tan, 1999).

In their analysis of the relationship between macroeconomic trends and demographic changes, Ogawa and Tsuya (1993) found a growing diversity and divergence of trends between the four sub-regions - East Asia, South-East Asia, South Asia, and Oceania. They discovered striking contrasts between South Asia and the rest of the sub-regions in terms of economic and fertility transitions and suggests that, to a large extent, the difference could be explained by the superior human capital investments in the latter, going back well before the period of rapid growth since the 1960s.

Drawing from their analysis, Ogawa and Tsuya (1993) conclude that high levels of human capital can only be beneficial for economic growth if a politically, socially, culturally and institutionally favourable environment accompanies it. Two contrasting cases from the region were taken as examples: the case of the failure of Philippines in keeping up with the rest of the countries of the South-East Asia and the case of Japan that made almost unbelievable economic recovery after the devastation of the Second World War. The Philippines began with similar high levels of human capital, but was also disadvantaged by 'misguided policies and deeply rooted cultural and institutional barriers to change...while Japan succeeded with the overwhelming importance of the human capital factor, supported by positive social, cultural, and institutional factors' (Ogawa and Tsuya, 1993). For instance, as pointed out by Stevenson (1998), it is not only accessibility to schooling that is emphasised in societies like Japan, but also the quality aspect through a combination of flexible curricula, supplementary schooling within the school system and supplementary schooling outside the school system, in addition to a strong emphasis of quality vocational education.

Furthermore, a country's capacity to adapt to modern technology in a changing economic environment and its ability to succeed in economic development is seen to be the reason for the unevenness of the development experience in the

Asian region, particularly the poor performance of the sub-region South Asia (Campbell, B., 1993). This implies that the quality of human capital, especially the quality of education in relation to economic needs, is a crucial element in the process of rapid economic development.

The existing literature on development and its links with human capital implies that these links operate through the enhanced ability and the flexibility of the workforce to effectively participate in the existing and emerging employment opportunities (Ogawa, Jones and Williamson, 1993; Rowen, 1998; Tan, 1999). Improvements in the quality of human capital would enable the economy to adapt to new technology, which enhances economic growth, which in turn creates demand for skilled employment, thereby providing the incentive for further investments and means for human capital development (Birdsall *et al.*, 1995; Knight, 1996).

3.1.2 Micro-level Linkages between Population and Development

While the quality of human capital is crucial for development at the macro-level and government policy intervention is important, the level of success in achieving human capital development targets at the macro-level will depend on forces that encourage or hinder the schooling and health care of children within families. It is at this level that the links between economic development and population growth can be observed more closely. The effects of population growth on micro-level factors such as household economic conditions, and the health, nutrition and education of individuals, particularly of women, are believed to be some of the more prominent ones that are involved (Cassen, 1994).

Human capital development entails enhancing the 'quality' of human capital, which is the development of the capability (education) and capacity (physical and mental health) of persons to work productively. Jones (1992:25-26, citing Leibenstein, 1971, Berg, 1973, Wheeler, 1983, and Behrman, 1990:54-58) states that the quality of human capital can be influenced by several factors; parental and societal influence, the influence of the school system, and the health and nutritional level of the individual (Hossain, 1990; Behrman, 1993;

Standing, 1983; Bledsoe *et al.*, 1999). Mason (1993) observes that studies of human capital should ideally include, at the most basic level, education and health inputs as variables of its quality (see also Gundlach, 1999). However, because of measurement difficulties for the health aspects of human capital, most studies tend to focus on standard measures of education as a measure of human capital (Jones, 1992; Kelley, 1995; Parish and Willis, 1993, 1994; Knight, 1996; Byron and Manaloto, 1990; Conlin and Titcombe, 1995; Becker *et al.*, 1990).

While the omission of the health aspect from the studies of human capital raises questions about the robustness of their results, it has been found that the effects of improvements in education and health reinforce each other, both directly and indirectly (Jones, 1992). The direct effects of health on education are through the increased productivity of workers, longer years of productive employment, increased incentive to invest in one's own human capital, and further incentives for parents to invest in the human capital of children, most notably schooling (Ram and Shultz, 1979). An indirect effect of education on health is through the educational attainment of mothers on their children, and the survival chances of children increase with mothers' education (Cleland and van Ginneken, 1988 cited in Jones, 1992; Bhuiya and Streatfield, 1991; Bourne and Walker, 1991). This implies that children of educated mothers are likely to be healthier than those of uneducated mothers.

At the micro-level, theories of fertility decline provide, perhaps, the most important theoretical links between population growth, human capital and development (Becker, 1960, 1981, 1991; Becker and Lewis, 1973; Becker and Tomes, 1976; Willis, 1994; Schultz, 1993; Caldwell, 1976, 1980; McNicoll, 1980, 1988; Lesthaeghe, 1983; Knodel and van de Walle, 1979; Cleland and Wilson, 1987; Watkins, 1981, 1991; Bongaarts and Watkins, 1996). The basic demand theory framework of economics, since its initial introduction to demography by Leibenstein (1957) and Becker (1960) has been perhaps the most influential approach in micro-demographic research, and more specifically the economic rationales of fertility decline, till today. It is based on two main concepts, the rationale behind high birth rate in subsistence

societies and the rationale for limiting the high birth rates as economic development occurs. The essence of Becker's theory is that couples make calculations on the basis of utilities or satisfaction of having an additional child, against the monetary and psychological costs of having that child. Becker's (1960) model, the most widely regarded as the starting point for the modern approach to the economic analysis of fertility (for example, Easterlin, 1978; Willis, 1994; Robinson, 1997), assumed that since children do not appear to be an inferior commodity, a rise in long-run incomes would lead to more children and higher fertility. Economists such as Shultz (1971), Willis, 1973 cited in Willis, 1993, also provided economic explanations of fertility along somewhat similar lines.

Becker's neo-classical micro economic approach of fertility research (1960) also referred to as 'new home economics', likened children to 'consumer durables', a unique asset with no close substitutes. But as fertility levels declined with economic growth during the demographic transition in Europe, the concept of children as consumer durables implied that, since demand for children declines with increasing income, children are seen as an inferior good (Leibenstein, 1975; Robinson, 1997). The concept of 'child quality' was thus added to the model (Becker and Lewis, 1973; Becker and Tomes, 1976; Becker 1981, 1991). Parental investments in the quality of children as defined by Razin and Sadka (1995:13) can be made in a number of ways: 'spending on the current consumption of the child, investing in the child's health and education ("investment in human capital"), and providing for the child's future consumption ("bequest")'.

Becker's approach has been criticised from different aspects such as the treatment of children as consumer durables (Blake, 1968) and for the narrowness of its focus (for instance, Dusenberry, 1960; Willis, 1969). It has been characterised as a 'simplistic demand-oriented framework, with unnecessary and confusing 'quality of children' notion clouding everyone's thinking' (Robinson, 1997). While there has been much debate about what actually constitutes the quality of children, human capital as measured by

schooling and health remains a useful approach to measure micro-level linkages between fertility and development.

A different perspective comes from the wealth flows theory of fertility (Caldwell, 1980). It provides, in addition to the effect of economic factors, the effect of socio-cultural factors on fertility reduction through human capital investments. An important factor in the link between the reversal of wealth flows and the subsequent desire for fertility limitation is the increasing cost of children due to schooling. Schooling also increases the pace of change in societal and cultural props of high fertility (Caldwell, 1980). Caldwell's wealth flows theory has been strongly criticised (see for example, Thandani, 1978, see also Caldwell, 1981 for a restatement of the wealth flows theory). Other theoretical strands linking fertility and development are the institutional determinants approach, primarily advanced by McNicoll (1980; 1988) that also recognise, among other factors, the returns on educational investments, and the degree of employment security afforded in shaping the fertility incentives of couples; cultural and ideational theory offered by Lesthaeghe (1983) and diffusion theories (Knodel and van de Walle, 1979; Cleland and Wilson, 1987; Watkins, 1981, 1991; Bongaarts and Watkins, 1996). Of these, diffusion theories emphasise the key role of social interaction in the onset of transition and the pace of decline in contemporary populations, 'diffusion being the process by which innovation spreads among regions, social groups, or individuals, often apparently independently of social and economic circumstances' (Bongaarts and Watkins, 1996).

How does social interaction occur? According to Bongaarts and Watkins (1996:1) there are three levels – 'local channels which consist of personal networks connecting individuals; national channels such as migration and common language connecting social and territorial communities within a country; and global channels such as trade and international organisations connecting nations within the global society'. Thus, employment oriented circular migration from the rural to the urban areas and education oriented migration from the rural to the urban areas are key to the diffusion of modern ideas from the urban area to the rural households.

Migration is an important mode of transfer of wealth from the urban centred economic growth areas to the rural households in developing countries (Bertram and Watters, 1985, 1986; Bertram, 1999; Boyd, 1990). Of particular relevance for the flow of incomes from the urban workforce to their rural families is circular migration (Skeldon, 1985; Hugo, 1985; Chapman and Prothero, 1985). Labour migration and flows of remittances play a vital role in the development of the small island communities of the Pacific (Chapman and Prothero, 1985; Boyd, 1990; Bertram and Watters, 1985, 1986; Pirie, 1995; Connell, 1990). While Walsh (1982) and Connell (1990) concur with the positive effects, they also caution about some negative implications of such migrations (e.g. The diffusion of new tastes and the growing dependence on imported food items, thus increasing the costs of consumption expenditure that could otherwise be utilised for development investments such as human capital and capital expenditure).

Literature on small island development experiences suggest that, while human capital has played an important role in the economic and social development of the Caribbean countries (Fairbairn and Worrel, 1996), a dearth of human capital has probably been a significant factor in slow economic growth in the Pacific countries (Fairbairn and Worrel, 1996; Pool, 1992; Asian Development Bank, 1995; Schoeffel, 1996; The World Bank, 1996). In fact, as Schoeffel (1996) points out, 'most Pacific islands allocate a high proportion of resources to higher education, at the expense of primary education....which affects the quality of students moving into secondary and higher education'. The problems of human capital development in many of the small island countries are compounded by the loss of human capital to emigration to metropolitan cities (Walsh and Trlin, 1972; Fairbairn and Worrell, 1996; Bertram and Watters, 1985, 1986; Connell, 1987, 1990, 1991) more so in the Pacific (Walsh, 1973, 1982; Fairbairn and Worrell, 1996; Bertram and Watters, 1985, 1986; Connell, 1987, 1990, 1991) albeit to a lesser extent in Melanesia (Shoeffel, 1996; Friesen, 1993).

As is also found in larger developing countries, in most small island countries, particularly in the Pacific, international migration is often argued to be a

sustainable means of contributing to growth in the national income (Bertram and Watters, 1985, 1986; Bertram, 1999; Pool, 1992), that should be encouraged through appropriate policy measures (Shoeffel, 1996). Partly as a result of remittance flows, but probably more so due to higher levels of per capita aid inflows, most small island countries generally stand above the average for the developing countries in terms of per capita incomes (Commonwealth Secretariat, 2000; Pool, 1992).

As was noted in Chapter 1, Bertram and Watters (1985, 1986) proposed a development model characterising the nature of economic growth that has evolved in island countries of the Pacific. Based upon their analyses of development experiences of certain small island states of the Pacific, Bertram and Watters (1985) suggested the term MIRAB – short for Migration, Remittances, Aid, and Bureaucracy to characterise the peculiar nature of their economies where migration, remittances, heavy reliance on foreign aid for their development investment, and large bureaucratic structures. While the most prominent form of migration and remittance flows in the Pacific occurs between the island states and developed cities of the Pacific Rim (Waddell and Nunn, 1994; Pirie, 1995; Bertram and Watters, 1985, 1986), the model is not restricted to these international flows. Rather, it also allows for internal migration and flow of remittances from the urban towns to outer islands in these countries (Bertram, 1999) of the type more prominent in the larger island countries of Melanesia and in Kiribati (Walsh, 1982; Chapman and Prothero, 1985; Hayes, 1993; Friesen, 1993).

At a more macro-level, the supply of labour is determined by factors such as the size of the population, the age-sex structure of the population, and the age-sex specific labour force participation. The age-sex structure of the population is determined by the interactions of fertility, mortality and migration, which are termed autonomous factors, while the age-sex specific labour force participation is influenced by economic, social, cultural and demographic factors, termed induced factors (Farooq and Ofusu, 1992). In most developing societies, while the labour force participation of the male population in the age group 20 to 59 is almost invariably universal, the labour force participation of

other groups such as, women and youth are influenced by economic, social and cultural factors (Standing, 1978, 1983; Boserup, 1970, 1974; Farooq and Ofusu, 1992; Tenjo, 1990).

Women's ability to participate in the labour force, especially in the modern sectors through human capital accumulation has several beneficial effects. For instance, their participation affects not only reduced population growth rates through the increasing opportunity costs of having children (Standing, 1978; Willis, 1994; Boserup, 1974; Schultz, 1993), but results in greater care of her children through having greater control over household expenditures (Lloyd and Blanc, 1996; Mencher, 1988).

There are other equally, if not more, important factors that are crucial in the population and development nexus, such as housing (Mason, 1995; United Nations, 1991) and the environment (Panayotou, 1995; Redclift and Sage, 1994; Keyfitz, 1996), especially for small island countries like the Maldives that are land and resource scarce, and ecologically fragile (Wils and Prinz, 1996; Overton and Thaman, 1999; Campbell, 1993). However, these aspects of population and development are not discussed in detail here for two reasons. Firstly, they have complex interactions with both population and economic development in their own rights, and secondly, these aspects are beyond the scope of this thesis, since our focus is on population, human capital and development. Therefore, the environmental factors, although shown in Figure 3-1 will not be discussed in the theoretical model or in the analytical framework presented in this chapter. Nevertheless, due to the intricacy of the link between population and environment, particularly in the present context, this issue will be touched upon at various points in this thesis.

3.1.3 Macro-Micro and Micro-Macro Linkages

It is clear from the theoretical perspectives presented above that population and development are inextricably linked. Although, there appears to exist a close and direct link, a complex array of social, economic and cultural factors interact at both micro and macro-levels, and between these two levels. However, it is perhaps safe to conclude that, among other factors, human

capital (education and training, and health and nutrition) and labour force participation are important variables linking population and development. As suggested by the above theoretical perspectives, at the micro-level the fertility decisions of couples are linked to decisions about providing higher quality schooling to their children. Investments in human capital encourage labour force participation especially of females, which has a negative effect on their fertility through delayed marriage and fertility control. At the same time education also helps them take greater control over household resources and household decisions. Women being more likely to devote greater resources to the care and human capital of children, this has an additional impact on the human capital development at the level of the household.

In some countries cultural forces have encouraged high levels of educational participation and attainment, as has been the case in many of the East Asian countries (Williamson, 1993; Rowen, 1998; Stevenson, 1998). High values attached to education and other attitudinal factors that encourage high achievement are believed to hold the key to the economic success of these countries (Ogawa, Jones and Williamson, 1993; Stevenson, 1998). Such socio-cultural factors that influence household level behaviour are also likely to influence national level policies through demands created for services such as increasing opportunities for schooling for the entire population.

On the other hand, policies that lead to economic growth and those that are targeted at increasing the human capital stock of the country, although initially likely to affect the urban elite, are likely to gradually spread across all levels of the society through channels of societal interaction (Watkins, 1991; Bongaarts and Watkins, 1996). Such influences are likely to induce the demand for education at all levels of the society. Increased schooling leads to higher age at marriage, increasing labour force participation, especially of women, and increasing preference for smaller families. Preference for smaller families would in turn slow down the rate of population growth. Similarly, increased demand for, and accessibility of schooling is likely to lead to increased savings and investment in human capital and economic growth. As Becker puts it,

'families have large effects on the economy, and evolution of the economy greatly changes the structure and decisions of families' (1988:11).

The above theoretical reviews suggest that the macro-micro and micro-macro linkages between population, human capital and development cannot be studied within a single theoretical paradigm. While the neoclassical theories of economic growth provide the basis for the importance of factors such as delayed marriage and household factors on fertility control, the new growth theories acknowledge the importance of human capital factors for development. In order to provide further support to our empirical findings theoretical discussions of particular relevance to the variables used in the micro-level analysis will be discussed in the relevant chapters in Part C of this thesis.

3.2 Theoretical Model

The theoretical model presented in Figure 3-1 provides a diagrammatic illustration of the inter-relationships between population, human capital and development as evidenced from the review of literature presented above. Overall, demographic factors, economic factors, social factors, and environmental factors are interlinked at the macro-level. In contrast, household demographic characteristics (household type, size and composition and migration, and for women, their levels of fertility), human capital of individuals (education, health and nutrition), and the labour force participation of adult members of the household, and their links with the household levels of affluence (defined in the present context by the Index of Household level of Development – IHD) operate at the micro-level. While interactions occur between all these factors at these two levels, interlinkages also exist between these two levels, from micro to macro and vice versa. Probably the most important interactions occur at the micro-level.

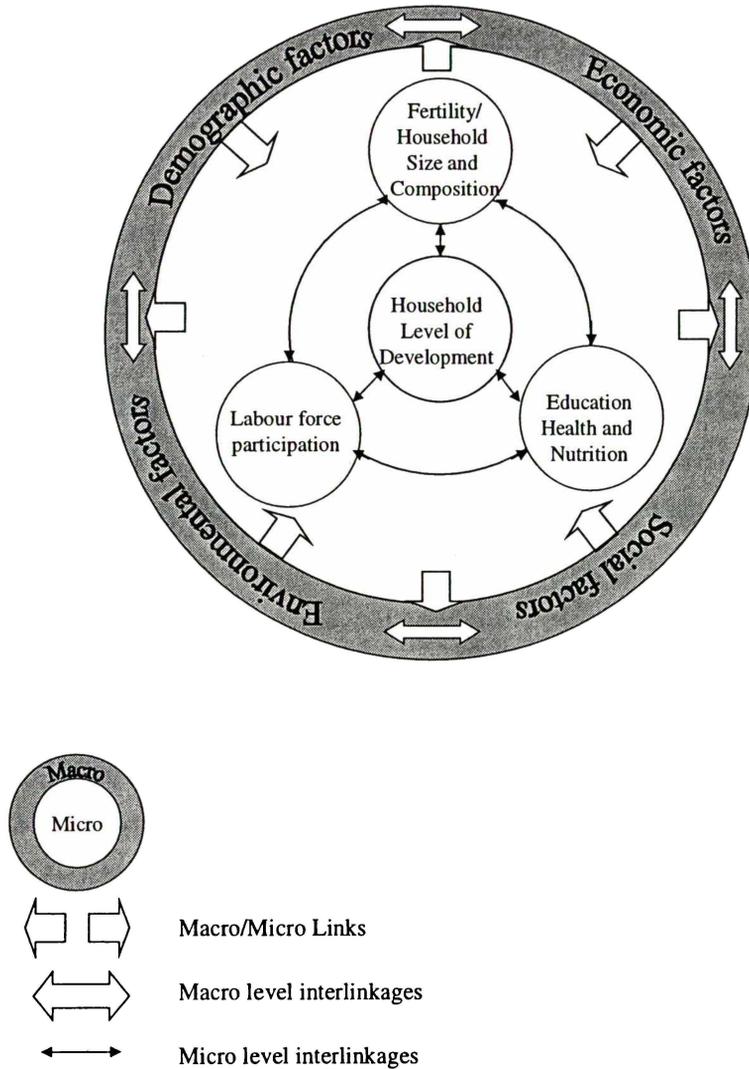
The aggregate effects of micro-level interactions influence the macro-level factors through growth in demand for education, enhanced adaptability of the workforce to changing labour market needs, improved living conditions, and

preference for smaller families. On the other hand, processes such as education, employment, migration, and less obvious means of interaction such as through various social networks transfer ideational changes from the alien cultures to the urban communities to the households in the rural areas that induce micro-level changes (Walsh, 1982; Watkins, 1991; Bongaarts and Watkins, 1996; Birdsall *et al.*, 1995; Knight, 1996; Connell, 1990), inducing further change at the macro-level.

Development at the level of the household is related to, among other factors, household size and composition, of which fertility and household types are important factors. Similarly, the labour force participation of household adult members also affects the level of development of the households. Especially their ability to secure employment in the better paid service sectors of the economy, which is dependent on the levels of education or skills possessed by individuals.

Education of individuals is related to delayed marriage and increased labour force participation (Cochrane, 1983; Freedman *et al.*, 1994; Willis, 1994). While delayed marriage acts to delay the onset of childbearing (Smith, 1983; Retherford *et al.*, 1999), increased labour force participation of women increases their cost of time, leading to fertility decline (Willis, 1994; Standing, 1978, 1983; Diamond, *et al.*, 1999).

Figure 3-1: Theoretical Model of the Interlinkages between Population, Human Capital, and Development and Their Macro/Micro Interactions



Source: Developed by the author

Apart from the effect of the cost of time, education is also known to have its impact on fertility declines as increased school enrolment and the higher cost of schooling affect the family income leading couples to opt for child quality over child quantity (Becker and Lewis, 1973; see also Eloundou-Enyegue, 1999). Similarly educational opportunities, especially for rural females encourage delayed marriage (Smith, 1983; Retherford et al., 1999; Lloyd and Mensch, 1999). In societies such as that of the Maldives where childbearing out of wedlock is rare, this leads to delayed childbearing, ultimately affecting levels of completed fertility.

These relationships exist at the micro-level, but have a macro-level analogue: improvements in the quality of human capital enable the economy to adapt to new technology, which enhances economic growth creating demand for skilled labour at the macro-level. This opens up further incentives and means for investment in human capital development at the micro-level (Birdsall *et al.*, 1995; Knight, 1996).

Macro-level economic developments can be translated to micro-level improvements in people's average living standards. This occurs when, through human capital development and labour force participation people are able to access the modern sector employment opportunities, and thus reap the benefits of development for themselves and their families.

3.3 Analytical Framework

Analysis of the interrelationships between population, human capital and economic development in the Maldives will be at two levels: A macro-level analysis will focus on the broad trends in these variables. Micro-level interlinkages will analyse the relationships between these variables at the individual and household level.

Aggregates based on individual level data from the censuses of 1985 and 1995 and published data from other sources will be used to explore the relationships between demographic factors, economic factors, and human resources

development in the Maldives at the (macro) national level. This macro-level analysis will establish the broad trends and differentials using published and unpublished literature to provide a clearer perspective to the reader on the topics of interest.

A micro-level analysis of the interlinkages between these variables will be carried out largely on the basis of individual level data from the 1995 census. Qualitative data from fieldwork conducted by the author, in three island communities of the Maldives will provide some qualitative illustrations and support to the findings from quantitative analyses presented. Other comments made here that are not based on the findings from the analyses in this thesis, or on empirical work cited in this thesis, are based on the author's own experiences over time. This point must be stressed because there is a relative lack of analytical literature on the Maldives by comparison with some Pacific small island countries. It appears for example, that there are a few basic ethnographies, most of which are now out of date. Nevertheless, they describe the Maldivian society of the past and have thus been quoted in appropriate places in this thesis.

The review of literature presented above reveals the theoretical linkages between population, human capital and development. At the macro-level, these relationships will be studied through the analysis of trends and socio-economic and demographic differentials in the different aspects of human capital, population growth, and economic development. Micro-level relationships between these factors will focus on a composite index of household level of development and indicators of the other variables developed at the level of the household. Four different analytical models depicting the independent effects of socio-economic and demographic factors on fertility, education, employment, and household level of development will be used.

Figure 3-2 provides a diagrammatic illustration of the framework for the analysis of the interrelationships between these variables. The figure does not show the patterns of causality between variables. Rather, the arrows that link the boxes indicate interlinkages between the different variables. As seen in

Figure 3-2 migration and employment are important micro-level factors linking fertility, human capital and development at the micro-level and also in providing the micro/macro and macro/micro linkages that are ultimately linked to development at the level of the household and overall national development. While government policies play an important part at the macro-level, the influence of sociocultural factors are important for micro-level changes that affect household levels of development.

On the basis of the theoretical model presented here and the analytical framework proposed above, we now turn to the presentation and the discussion of macro and micro-level analyses of the linkages between population growth, human capital and development in the Maldives using census data with further dimension and support provided by the qualitative data collected by the author. However, before we go into the analytical chapters we will discuss the quality of data and the analytical methodology, which will be the focus of the next chapter.

Chapter 4: Data and Methodology

Quantitative analysis in this thesis is mainly based on the individual level data from the censuses of Population and Housing of the Maldives for the years 1985 and 1995 and the published tables from the census of 1977. Published data drawn from other sources will be used to fill up the gaps in census data and to supplement it. The published data come from the Statistical Yearbooks published by the Government of Maldives since 1980. Other sources of data are published and unpublished reports and documents of the different departments of the government. Whenever published or unpublished data are used appropriate references are given to the source of the data. Unless otherwise stated all data presented in this thesis are from computations made by the author, from the respective census data.

Qualitative data collected by the author during the period November 1998 to February 1999, from three selected islands of the Maldives, will be used to support the findings from the qualitative analyses. A summary of the qualitative inquiries is provided in Appendix 2.

4.1 Census Data

4.1.1 Coverage and Quality

For the purpose of establishing long term trends in some social, economic and demographic characteristics of the population, data from unpublished reports of the 1911 and 1921 censuses of Maldives (the earliest available quantitative data on the population of Maldives), were used. These censuses were coordinated by the British Administration in Ceylon (Sri Lanka) and conducted by Maldivian Government officials. The census returns were tallied in Male' and sent to Colombo, where it was translated into English by the Maldivian Government Representative in Colombo and submitted to the Census Office for publication, together with the Census of Ceylon (Department of Census and Statistics, 1979).

These early censuses were conducted under extremely difficult conditions created by the need for extensive travel between the islands, dependent entirely on sailing vessels. Thus, there is much room for errors in the data. The data are, therefore, used to glean a rough sketch of the economic conditions at the beginning of the 20th Century. Both these censuses were conducted on a 'de jure' basis (Department of Census and Statistics, 1979).

The first modern census conducted in the Maldives was in 1977 with the financial and technical assistance of the United Nations Population Fund. Unlike the earlier censuses, which were 'de jure' enumerations, for the first time in the Maldives, data collection in 1977 was mainly based on the 'de facto' method of enumeration. However, there were some deviations from this method where Maldivian seamen who were overseas at the time of the census were counted, but all foreign nationals who were present in the Maldives at the time of the census were excluded.

The census of 1977 was planned and coordinated by overseas-trained local census officials and employed middle and senior level officials from various government departments as enumerators. The period of enumeration was three days from 29th to 31st December 1977. Revisits were made to all households on the 1st of January 1978 to check for any births or deaths in the household since the enumeration.

Two major weaknesses of the census of 1977 may be noted. Firstly, all preparatory activities including drafting of the questionnaires, training of enumerators and other preparatory work¹⁸ were completed in just four months and the questionnaire was not pre-tested. The second weakness relates to the editing and coding stage where the editing and coding was done in different government departments without adequate supervision. However, the edit and

¹⁸ Especially when all the census documents were prepared in the Latin script; in the late 70s the then government, made it compulsory for all official documents to be written in Latin script instead of the locally used Thaana script as it was believed that it would be more cost effective than developing a Thaana typewriter. At a time when most people were not exposed to reading the Latin script it was a major drawback, especially for older civil servants. With

code verification was done centrally. Data entry, processing and tabulations were conducted in Colombo, at the Department of Census and Statistics of Sri Lanka (National Planning Agency, 1980). These factors should be kept in mind when interpreting the aggregates prepared from the 1977 census data.

The census of 1985, which was processed in the Maldives, provided computerised records of individual level data for the first time. However, only limited analysis has been made from this data (see Chaudhury, 1996). The United Nations Population Fund provided much of the financial and technical inputs for this census as well. The fieldwork was conducted between 25 March 1985 and 29 March 1985. The types of data collected in this census included information on the type of households and the quality of housing, including access to amenities, demographic, educational, and economic characteristics, and monthly incomes of individuals.

Preparations for the census of 1985 were put underway well in advance. Drafting and pre-testing was completed in early 1984 and a training manual was prepared on the basis of the finalised questionnaire to begin training of enumerators towards the end of 1984. Enumerators were provided one week of intensive training on the census methodology and interviewing techniques with mock interviews conducted at the end of the training. The enumeration was conducted between 25 and 31 of March 1985. Improvements in communications between islands and the atoll capitals, and between atoll capitals and Male' island, enabled direct communication between the atoll capitals and the census headquarters in Male' island throughout the census week. This helped to deal with any problems as and when they arise. Verification, editing and coding of the census returns were conducted centrally and under the direct supervision of the census staff in Male'.

Processing of data was also conducted at the census headquarters in Male' for the first time (Ministry of Planning and Development, 1986). Although there

the change of government in 1978, however, this policy was abandoned in favour of the Thaana script.

was no post-enumeration survey to verify the quality of the census, improved administration and technical expertise implies that the quality of data from the census of 1985 would be of better quality than the previous censuses.

The census of 1995 was conducted between 25 March 1995 and 31 March 1995. It collected more detailed information than 1985 census in almost all areas that were covered in 1985, but omitted the question on individual incomes as it was felt that the question on income did not provide accurate information on the actual incomes of the people, especially when incomes were derived from more than one source, which has been the increasing trend in the recent years. In addition to this, for the first time, information was collected on household possessions and on contraceptive use. The preparations were similar to those of 1985. However, in spite of more advanced communications between the atolls and Male' island and between the islands compared to 1985, several delays were encountered in the completion of enumeration in some islands. In such cases teams were dispatched from Male' to assist the island staff in completing the enumerations. The enumeration was completed within the first week of April 1995 (Ministry of Planning, Human Resources and Environment, 1996).

The methods of enumeration in 1985 and in 1995 were the same as that in the census of 1977. However, in 1995 an attempt was made to enumerate the expatriate population resident in the country at the time of the census. Due to problems encountered in counting expatriates, especially those living in rental rooms in private houses in Male', the census enumeration of expatriates was incomplete and was thus excluded at the data entry stage. Similarly, the census of 1995 also attempted to collect information on Maldivian families who were resident abroad at the time of the census. This operation was only of limited success as relatives of these families, who were resident in the Maldives, were unable to provide any information on them. As the numbers of persons residing overseas was estimated to be relatively small (see Chapter 7) the impact of such an undercount is not likely to be significant for the demographic and socio-economic characteristics of the population.

It is well known that census data, especially in developing countries, are subject to various forms of error. There are two main types of errors that could occur in a census. Coverage errors are caused when some people are omitted during census enumeration. In some instances the same person is counted twice, leading to over-counting. Several measures are taken during data collection and data processing to minimise these problems. However, due to the absence of major enumeration problems, it can be assumed that the census of 1995 is comparable with the census of 1985 in terms of degree of completeness. The other main form of errors in census data arises due to errors in the reported content (see Shryock and Siegel, 1976:37).

In the absence of information on the level of completeness of the census, an indirect (United Nations, 1990) method is employed to derive estimate of the relative coverage for two censuses. The method of estimation is based on five-year age distributions by sex for two censuses and an estimate of the level of mortality relating to the inter-censal period from either the United Nations (1982) or the Coale-Demeny (1966) model life tables. It was assumed that the South Asian Pattern of mortality would be most applicable to the Maldives.

The mortality levels estimated in Chapter 6, which relates to 1992, was assumed to be roughly representative of the intercensal average, which is likely to affect the estimates of completeness. Similarly, the estimates only provide an indication of relative completeness and any errors in the completeness of the

Table 4-1: Estimates of Completeness of 1995 Census Relative to the Census of 1985¹⁹

Age group	Level of completeness	
	Males	Females
5-60	0.9152	0.9594
5-70	0.9034	0.9202

Source: Computed by the author based on census data

¹⁹ Unless otherwise stated all tables and figures presented in this thesis are those prepared by the author using data from the relevant census of Maldives.

first census would likely affect the estimates of completeness of the second census. In spite of such drawbacks, in the absence of other indicators, these estimates provide useful information on the degree of reliability of the census data for further analysis.

These indicators suggest that the degree of completeness of the census of 1995 in comparison to the census of 1985 is satisfactory. The actual level of completeness is likely to be better than the estimate since the mortality assumptions behind these estimates are likely to produce a higher expected population in 1995 than would be the case, had the mortality levels used corresponded to exactly the mid point of the intercensal period.

Other forms of errors in the collected data occur due to age misreporting. The most common form of misreporting in the developing countries occurs when people either do not know their correct ages, or when some people report their ages wrongly. Fluctuations in the age structure that are caused when, for some reason, people report their ages ending with a certain preferred digit such as 0 or 5, are referred to as digit preference (Shryock *et al.*, 1976:114-115).

Several indices have been developed for the evaluation of census data for errors in age and sex composition. The principal indices are: sex ratios, age ratios and indices for detecting digit preference in age reporting (Arriaga, 1994).

The United Nations (1952) proposed using age ratios as indices for detecting age misreporting in populations where fertility has not fluctuated greatly during the past, and where international migration has not been significant. Age ratios are calculated by dividing the population in a specific five-year age group by the average of the populations in the two adjacent five-year age groups, multiplied by 100. The greater the deviations of these ratios from 100, the larger are the possibility of errors in the data (United Nations, 1952).

Similarly, sex ratios can also be used to identify possible errors in the reported age sex structure of a population. It is calculated by dividing the number of males in a given five-year age group by the number of females in the same age

group. Similar to age ratios, the larger the abrupt departure of these ratios from close to 100 the higher the possibility of errors in the data (Arriaga, 1994).

The extent of digit preference or avoidance in age reporting among the population of Maldives is investigated by using three indices. These are, Whipple's Index (Shryock *et al.*, 1976); Myers' blended method (Myers, 1940 cited from Shryock *et al.*, 1976); and Bachi Index (Bachi, 1952 cited from Shryock *et al.*, 1976).

Table 4-2: Measures of Digit Preference, Maldives, 1995 census.

Method and terminal digit	Male	Female	Both sexes
Whipple's Index	1.44	1.42	1.43
Myer's Index	14.8	13.2	14.0
Bachi's Index	11.2	10.4	10.8

Source: Computed by the author from census data

The Whipple's Index detects a preference for ages ending in 0 or 5, with the index varying between 1, indicating no preference for 0 or 5, and 5 indicating that only digits 0 and 5 were reported. Myer's index and Bachi's index are similar, although the magnitude of Myer's index is higher than the Bachi's index. Both provide the magnitude of the excess or deficit of persons in ages ending with any of the digits from 0 to 9. The theoretical range of Myer's index and Bachi's index is from 0 for no heaping to 90 for total heaping, where all ages are reported at a single digit (see Shryock *et al.*, 1976 for a discussion of these indices).

As can be seen from Table 4-2, age reporting in the census of 1995 can be described as inaccurate. Thus, it would be desirable to apply some form of smoothing to adjust the distortions in the age structure before it can be used as a basis for population projections.

4.1.1.1 Data of Special Significance to this Thesis

While the overall quality of censuses, especially the census of 1995, can be taken to be of acceptable quality needing only minor adjustments in the age

distribution, some areas that are of special relevance for analysis of inter-linkages between human capital and development need further assessment of the quality of data collected on these topics in the censuses. Since 1977, census data in the Maldives has been collected in accordance with the guidelines provided by the United Nations. The areas of data covered include, household characteristics, demographic characteristics, economic characteristics, social characteristics, and for women, their fertility and child survival. For the first time in 1995, information on contraceptive use was also collected (See Annex 1 for an unofficial English translation of the 1995 census questionnaires).

i). Age data

Age recording in all the censuses are based on a single question asking the respondents their age, in completed years, at the time of the census. Ages of those who do not know their birth year are calculated with the aid of a flash card (events calendar²⁰) showing local historical events and their corresponding dates. In such cases the age of the respondent is calculated by the enumerator, based on the event that the respondent thinks is closest to his or her year of birth. This method was maintained for all the censuses from 1977 to 1995. Since many older people do not know their exact ages, age reporting errors are inevitable, especially at the older ages in all censuses.

Although the Christian calendar is used virtually for all purposes in the today, excluding those events that are linked to religious customs, traditionally, it was the Islamic calendar that was more widely used in the Maldives. Even today, in some rural areas of the country, and more so among the older generations, many of the respondents still report their ages based on the Islamic calendar. This is likely to have some effect on the reported age structure of the population.

20 As more information on historical events that people can easily relate to become available through research, the events calendar gets updated for every census.

Another factor that may influence the reported age in the Maldives is the custom of stating ones age in terms of on-going year as opposed to completed years. In order to deal with these problems, all censuses have carefully worded questions on age of the respondent and introduced crosschecks in the questionnaire that can be applied both at the time of enumeration and during computer editing. In spite of such control measures, it is likely that the reported ages are affected by slight inconsistencies due to such practices. An analysis of the accuracy of age reporting has been presented earlier in this Chapter.

ii). Fertility

The measures of fertility used in the analysis will be based on the data collected in the censuses on number of births in the year preceding the census and number of children ever born to all women in the reproductive ages, irrespective of her marital status. The questions that captured the data on fertility have remained the same throughout the censuses. All females 12 years of age and over were asked questions on fertility (see Appendix 1).

The census of 1995 collected additional information on births. As retrospective data relating to events in the past are subject to reporting errors due to recall lapse, additional information was collected mainly to get a more accurate count of the number children ever born and number of children surviving to a woman in the reproductive ages. They include information on the number of children ever born alive currently living with the woman, number living away from the woman, and number dead. This information was also collected by sex. In this respect, the information on a woman's birth history from the 1995 census is less likely to be under-reported than in the previous censuses.

iii). Migration

Information on internal migration is normally collected through questions on the place of birth, place of usual residence, place of enumeration, place of residence five years before the census, place of residence one year before the census, and number of years of continuous residence in the place of residence

at the time of the census. However, this information varied from census to census. Information on the place of residence, one year before the census, and five years before the census, was collected in 1995, but not in 1977 and 1985.

In the censuses of the Maldives, the usual place of residence is defined as the last place where a person has resided for a period of one year or more prior to the census. This also applies for the questions on place of residence one year and five years before the census.

The census of 1985 included eight questions in the section on migration. These include questions on, the place of birth, the place of registration, and the place of usual residence. Although the census of 1995 included seven questions, they captured more information on migration. In addition to the above they include questions on migration within the five years preceding the census, one year preceding the census, and reasons for migration from the last place of usual residence. In addition to these, information was also collected on those who had ever-moved during their lifetime.

In spite of these data, the census still does not capture the full picture of internal migration in the country and much more detailed information needs to be collected in order to capture people's movements over a period of time. However, in the absence of such detailed data, census data provides an approximation of the extent of internal migration within a country.

Like other retrospective information collected in a census, information of migration, especially when it relates to a certain fixed period in the past, is subject to reporting errors. The further back in time the event is, the more likely it is to be erroneously reported.

iv). Employment

As for fertility and migration, information on labour force characteristics was limited in the census of 1985 compared to 1995. In the census of 1985, labour force status was derived from the following questions: What were you engaged in most of the time in the past week? Did you look for work for pay or profit

in the past week? What is the reason for not seeking work for pay or profit in the past week? On the basis of these questions, further information was collected on the type of work (occupational and industrial categories) and employment status.

In the census of 1995, one's labour force status was determined, in addition to the above questions, by the following questions: was the respondent engaged in any work for pay or profit during the reference week? Even if the respondent did not work in the reference week did he have a job from which he was temporarily absent? If the respondent looked for work and if work was available would he have been able to start work during the reference week?

Both the 1985 and the 1995 censuses collected information on one's main economic activity (based on time) and one's secondary economic activity during the reference week. This is because it is quite common for Maldivians to be engaged in more than one economic activity. The use of time, rather than the income as a determining factor for the main activity and the secondary activity, may cause some bias in identifying the link between one's level of living and industry of employment, since some people are able to obtain a better income from their secondary activities than from their main activity. This may be especially true for those employed in the public sector, as public sector wages are very low compared to what one could get from the private sector, or sometimes the informal sector activities. Relationship between income and one's secondary economic activity is likely to be an area of interesting research in itself and is, therefore, not within the scope of this thesis. Hence, this aspect of employment will not be included in the analysis of relationships between employment and development in this thesis.

Based on the main economic activity of the respondents, the industrial classifications used to code the data into different industrial categories are the different versions of the International Standard Industrial Classification of All Economic Activities developed by the United Nations (United Nations, 1990). Although the census of 1985 was coded on the basis of the 1968 version of the classification (United Nations, 1968), these were updated to correspond the

1990 classification by the present author, using the correspondence tables from the 1990 version.

Occupational data were coded on the basis of the International Standard Occupational Classification of 1968 (ILO, 1968) for the 1985 census. Similar to the industrial classifications, these codes were updated by the present author using the correspondence tables published in the 1988 version of the classification, referred to as ISCO-88 (ILO, 1988).

v). *Education*

The censuses of 1985 and 1995 collected information on education for all persons six years of age and over at the time of the census. Similar to demographic and employment data, information on one's educational level captured in the census of 1995 was more comprehensive. While the census of 1985 collected information on the highest level of education completed in terms of grade and other types of qualifications, no information was collected on current level of school attendance. The census of 1995 included a question on the current level of attendance for all those who were attending any educational institutions at the time of the census.

In both censuses (1985 and 1995) information on educational attainment was collected on the basis of respondent's answer to the question – "What is the highest level of education attained?" The pre-coded responses were broadly divided into two categories: The first category is the formal grade completed up to grade 12, and the second category is the higher education, both formal and vocational. The second category can be further divided into local training certificates, short-term diplomas, long-term diplomas, and university degrees and equivalent qualifications.

The response categories for the question on the highest level of education completed by the respondent were similar for formal grade levels, but slightly more elaborate for 1985 compared to 1995. In order to make the information from the two censuses comparable, the educational codes for informal categories were re-coded on the basis of the author's knowledge of the

approximate correspondence of those qualifications with the formal grade levels. While extreme care was taken in assigning the most probable re-codes to these levels, it is possible that some bias may have been introduced into the proportions in the formal grade levels due to this re-code. Whatever bias introduced is likely to be in the lower levels of educational attainment and thus is not likely to exaggerate the overall levels of educational attainment in the country.

In classifying the formal schooling levels grade 12 and below the normal international classification will be applied; grades 1 – 7 primary and grades 8 – 12 secondary. However, since many areas of the rural Maldives still do not have access to primary education above grade 5, and those who seek higher levels are required to travel to areas where such facilities are available, it is necessary to further classify the primary category into basic education (grades 1-5) and extended basic education (grades 6-7). Grades 1-5 are referred to as the Basic Primary and grades 6-7 as the Extended Primary (Ministry of Education, 1995).

For older people who had not gone through the formal English medium system of education, classification in a certain grade was determined by the respective class that the individual last attended in the local medium school or the traditional school (Ministry of Planning, Human Resources and Environment, 1995). This will have some effect on the proportions with a given level of educational attainment. However, since the number of classes in such traditional schools seldom exceeded three or four classes (Ministry of Education, 1995), any undesirable effect of this method of classification on the distribution of the population by educational level is likely to be minimal.

For some people who were unable to correctly report their completed level of education, but were able to report the number of years attended, their grade completed were reported in the number of years completed (Ministry of Planning, Human Resources and Environment, 1995). This is likely to affect the proportions of population reported in certain grades. However, it is also likely that many of them were recorded in the 'unknown' category.

4.2 Registration Data

Registration of vital events has been carried out in the Maldives for a fairly long time. However, the promptness of reporting births to the appropriate authorities and the punctuality of recording them still remain questionable. It was not until recently that any significant need to formally register a child became more widespread, although records of births have always been maintained by island administrations and by the relevant government department in Male'.

With the growth of modern schooling throughout the country and the requirement of a birth certificate to enrol a child in a school, the need for birth registration has increased. However, most people would not formally register the births of their children until it is required to do so when they reach the school going age which, in most parts of the country, is six years. This is likely to cause distortions and inaccuracies in the reported births in a given year.

The need to register a death is more urgent than a birth, as it is not legally or socially acceptable for the dead to be buried in the Maldives without the presence of a local priest. More importantly the dead cannot be buried unless the death form has been filled stating the time and place of death. In the case of older persons, age at death is likely to be misreported. With the introduction of the National Identity Card system during the 1980s and 1990s, every person has a record of their age that can be referred to if needed. This is expected to minimise the errors of recording the age of deceased at the time of death.

Several techniques have been developed to evaluate the completeness of registration data. Two such techniques are the Bennett-Horiuchi technique (Bennett and Horiuchi, 1981) and Preston-Coale technique (Preston and Coale, 1982).

Preston-Coale technique requires information on population growth rate and on the number of deaths and population by five-year age groups. This technique assumes that the population in question is stable and that it is closed to

migration. Other assumptions of this method are that under-enumeration of the population and under-enumeration of deaths are consistent in all age groups. While the migration assumption may hold true for the population of Maldives, the assumption of stability is certainly violated (see Chapter 5). This makes the Preston-Coale method unsuitable for the present situation.

The Bennett-Horiuchi technique, on the other hand, requires information on five-year age distribution of the population from two censuses and a similar age distribution of the registered deaths during the intercensal period. The major advantage of this method is that it does not assume that the population is stable. However, it assumes that age misreporting occurs only after the age of 50, both censuses have the same degree of completeness, and the degree of completeness of death registration is uniform above the age of five.

A major shortfall of this technique is that it does not measure the degree of under-registration of death under the age of five-years, which is normally prone to a high degree of under-registration. Regional differences in the completeness of registration of deaths may produce differential completeness by age in the total population and socio-economic differentials in mortality could also lead to a violation of the assumption, but more importantly, relative under enumeration in one census compared to the other would result in either upward or downward biased estimates of the completeness of death registration (Bennett and Horiuchi, 1981). In spite of such shortcomings, the advantage of the applicability of this method to populations that are far from stable outweighs the disadvantages posed by the other assumptions in choosing this technique to estimate the completeness of death registration in the Maldives using census populations from 1985 and 1995 census and registered deaths from Statistical Yearbooks of the Maldives.

Table 4-3 shows that the completeness of death registration estimated by the Bennett-Horiuchi method suggests systematic over-registration of deaths in all age groups, especially in the higher age groups. The most logical explanation for this unlikely pattern is that this is caused by an upward bias due to relative under enumeration in the census of 1985 compared to the census of 1995.

These figures also suggest that death reporting is fairly accurate in the Maldives.

Table 4-3: Estimates of the Completeness of Death Registration in the Maldives by the Bennett-Horiuchi Technique, 1985 - 1995

Age	Population		Growth rate	Intercensal deaths		Completeness of death registration*
	1985	1995		Number	Rate per thousand population	
0-4	32922	37049	1.2	3021	8.65	-
5-9	26050	40845	4.5	298	0.91	1.198
10-14	22282	35948	4.8	167	0.59	1.097
15-19	20794	24965	1.8	155	0.68	1.063
20-24	17530	21070	1.8	131	0.68	1.127
25-29	12536	18233	3.7	238	1.57	1.227
30-34	8254	15399	6.2	209	1.85	1.321
35-39	6720	12660	6.3	387	4.2	1.284
40-44	6544	6938	0.6	340	5.05	1.255
45-49	7560	6599	-1.4	429	6.07	1.302
50-54	6232	6261	0.0	554	8.87	1.352
55-59	4184	5975	3.6	1061	21.22	1.505
60-64	3889	5306	3.1	1436	31.61	1.468
65-69	1791	3208	5.8	1561	65.12	1.488
70+	2789	4357	4.5	4082	117.1	-

*Based on median completeness of 1.284

Source: Computed by the present author from census and registration data

While it has been mentioned that the accuracy of the registration of deaths is of less concern than the registered births, the above conclusion does not necessarily suggest the accuracy of birth registration data in the Maldives. A comparison of fertility rates from registration data with those derived from indirect techniques suggests that birth registration is of acceptable quality (see Chapter 5).

4.3 Published Data

Supplementary data from the published census tables, as discussed in section 4.1, and from the official statistics from the Statistical Yearbooks of Maldives

are used to provide insights into the socio-economic and demographic aspects of the population of Maldives.

The Statistical Yearbook is published annually, starting from 1980. Tables included in the Statistical Yearbooks are developed from routinely collected administrative data by the various government departments and state owned enterprises. Some statistics such as tourist arrivals, expatriate employment, and trade, are based on data collected at the central level by more qualified people. Others such as, fish catch, births and deaths, and educational enrolment, have a significant input from the island administrations. Statistics that have a significant input from the island offices are more likely to be subject to reporting biases since they are often compiled by less qualified persons who are more likely to associate the reported figures with certain policy decisions that may directly affect them.

Similarly, other published sources are often cited to either provide support to findings from the census data or to fill up some gaps in the census data. Further support for the findings are sought from the qualitative observations made from field investigations by the author.

4.4 Survey Data

Recognising the limited depth of information in census data, qualitative data will be used in this thesis to illuminate certain findings on the relationship between fertility, human capital, and development from the analysis of individual level data from the census. Qualitative data will also be used to establish the micro-macro linkages of these variables. Qualitative data were collected by the author in three selected islands of the Maldives during December 1998 to February 1999.

4.4.1 Methodology

Based on the author's own knowledge of the Maldivian communities and in discussion with informed persons in the Maldives, a purposive sample of three islands were selected in three different areas. The main factors that

differentiate the three areas are; their proximity to the tourism zone, their geographical positioning on the map of the Maldives archipelago, and their identities in terms of their special economic and social characteristics.

Although it would have been ideal if the selected islands were evenly spread out across the entire length of the archipelago, the limitation of time and resources compelled the researcher to select three islands that were located in the atolls towards the south of Male' island. However, it was assured that they were evenly spread across the length of the islands between Male' and the southern most atoll of the Maldives. The islands thus selected were; Mahibadhoo island in South Ari Atoll (within the tourism zone), Fonadhoo island in Hadhdhummathi Atoll (halfway between South Ari Atoll and Addu Atoll, outside the tourism zone) and Maradhoo-Feydhoo island in Addu Atoll (the southernmost Atoll of the Maldives, distant from the tourism zone). These islands provided a reasonable diversity of socio-economic characteristics (see Appendix II) and different levels of accessibility to Male' and the tourism zone²¹.

4.4.2 Survey Instruments and Fieldwork

Qualitative information was collected through unstructured individual interviews with members of selected households. In all three islands the selected housing units consisted of single households.

Twenty households were thus selected in each island and open-ended interviews were conducted, based on a predetermined list of areas that are of interest to the researcher (for list of questions see Appendix 2). Selection of houses was based on a systematic sampling method where the first house was selected randomly and the rest of the houses were selected systematically, by choosing every n^{th} house from the house-list from a recently conducted survey²².

21 See chapter 13 for categorisation of the islands of Maldives into different groups in relation to the tourism zone.

22 Survey of Establishments, 1997, selected islands of the Maldives.

The list of issues to be discussed was helpful for the researcher in assuring that the interviews covered the required information and that the interview was kept in focus. Although it was not possible to get interviews in a way that would give equal representation from all age groups of the society, information was obtained from a fairly wide range of people of both sexes covering different age groups and social and economic levels of the communities.

About one week was spent on each island in conducting the interviews. Since the houses on the islands are arranged in well-defined blocks, it was easy to locate the selected houses in each of the islands.

4.5 Research Methodology

Several approaches are adopted in the analysis of data in this thesis. Analyses presented in Part B relating to macro-level social and economic developments and the links between population, human capital and development at this level are mainly performed on the basis of simple frequencies, percentage distributions and cross tabulations, graphs and charts. Wherever there are deviations from these general approaches (e.g. population projections), the relevant methodology is discussed in the respective chapters. The micro-level analysis presented in Part C explores the interlinkages between population growth, human capital and economic development using various indicators derived from individual level and household level data from the 1995 census of the Maldives, with illustrations from qualitative data.

Two independently selected samples, using the method of simple random sampling, from the census data on all households in the urban area and the rural areas are used in the micro-level analysis of several socio-economic factors of the households and their members, on fertility, education, employment and development at the household level (as measured by the Index of household level of Development – IHD). Approximately 30 percent of rural and 30 percent of urban households are selected randomly among all the households from the census of 1995.

The multivariate analysis is based on the statistical technique multinomial logistic regression. Multinomial logistic regression allows the use of categorical data to determine the levels of the dependent variable and both categorical and continuous variables as independent or explanatory variables (see Wright, 1995). However, the analyses in chapters 15 and 16 are based on logistic regression as the dependent variables in the education and employment models are assumed to have only two categories (see the respective chapters for the categories).

Composite indices developed by the author for this thesis are used as proxies for household affluence (IHD), accessibility to modern sector employment (distant to tourism zone), and the dominant economic activity of island communities (nature of island economy). For the composition and the methods of derivation of these indices refer to Chapter 13.

**PART B: DEMOGRAPHY, HUMAN CAPITAL AND
DEVELOPMENT IN THE MALDIVES: THE BROAD TRENDS**

Chapter 5: Fertility and Family Formation

Maldives experiences one of the highest levels of fertility in the region of South Asia (Chaudhury, 1996). However, the past decade has witnessed perhaps the most important phase in the beginnings of a demographic transition of the population of Maldives – probable onset of a steady fertility decline, after a period of rapid mortality decline and high population growth.

Perhaps the most important factor of fertility decline in the Maldives is delayed marriage, especially among the rural women. The recent improvements in the availability of schooling in the rural areas of the country is likely to have affected the numbers of women that remain single well into their late teens and even their early twenties.

The present chapter explores the levels, trends and differentials of fertility and family formation in the Maldives during the ten-year period from the censuses of 1985 and 1995. Well known indirect estimation techniques will be used in order to arrive at plausible estimates of fertility. These estimates are also compared with direct estimates from census and registration data in order to test for the robustness of the indirect estimates. Being an important explanatory factor of fertility, the status of reproductive health as relating to women's health and contraceptive use is also reviewed.

5.1 Fertility Trends and Differentials

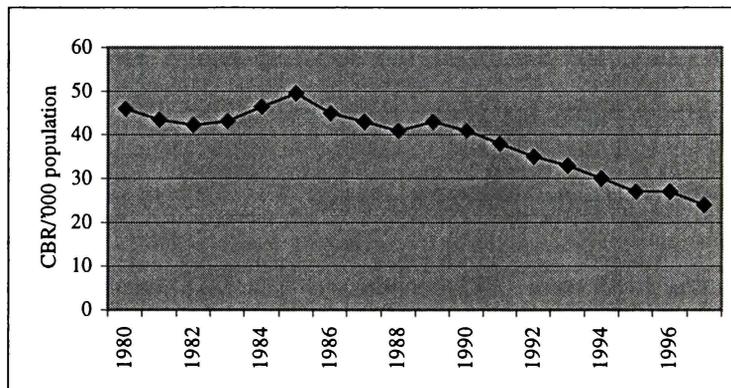
Data from the 1985 and 1995 censuses of the Maldives are used to compute indirect measures of fertility for the two census years. Direct measures are also employed to estimate the birth rate in order to compare with trend estimates from indirect methods. These direct estimates are obtained from data on the number of births in the year preceding the census as reported by women and the number of registered births from vital registration data. However, for the purpose of studying fertility differentials it was decided to rely on indirect estimates using cumulative fertility and child survival as reported by women in the census of 1995. The use of direct estimates to study fertility differentials is

likely to cause some problems since there is a possibility of errors in reported births in the year preceding the census. Such errors are likely to be caused due to the difficulty in accurately identifying the births that occurred after the given reference point one year preceding the census.

5.1.1 Fertility Trends

While recognising the possibility of some degree of incompleteness in the reported number of births, registration data on births can be used to plot the trend of fertility in the past, even when the actual levels of the observed fertility may be unreliable. Statistical Yearbooks of Maldives provide information on annual births from 1980 onwards, except for the years 1981 and 1982 (Statistical Yearbooks of Maldives, various years). Use of registration data assumes that the completeness of birth registration has remained fairly stable and has not declined during the period under observation. This is a fair assumption as any improvements in the registration of births are more likely to increase the number of registered births, whereas, the observed crude birth rates actually show a declining trend (see Figure 5-1).

Figure 5-1: Crude Birth Rates from Registration Data, 1980-1997



Source: Statistical Yearbooks, various years

The observed crude birth rates show wave-like fluctuations between 1980 and 1989. These fluctuations may be caused by age structural changes occurring due to the past experiences of fertility, mortality, and the effects of high infant and child mortality on the cohorts of women passing through the childbearing ages in different years on the numbers of births from year to year. However,

although the level of completeness of birth registration may have remained the same, changes in the age structure of the population may make crude births rates estimated on the basis of the total number of births and the total populations at different points in time incomparable. Using age-sex adjusted birth rates on the basis of standardisation provides a solution to this problem.

Direct standardisation is applied to estimate the adjusted number of births using age pattern of fertility from the censuses of 1985 and 1995 and the age structure of women in 1985. The resulting total births for the two years were divided by the standard (1985) total population. Since both the censuses refer to 31 March of the census years, the bias introduced due to the fact that births refer to the period one-year prior to the reference point of the population will be similar for both years. The crude birth rate estimated from the census of 1985 was 42.6 per thousand. The comparable standardised crude birth rate for 1995 was 29.3 per thousand. These estimates indicate that if the population age structure had remained the same from 1985 to 1995, the age pattern of fertility in 1995 would have produced a crude birth rate of 29.3 per thousand. This rate is only slightly lower than the estimated crude birth rate from the births in the past year from the census of 1995, which was 31.8 per thousand indicating that the effect of age structure on the crude birth rate is minimal. Independent from the registration data, these estimates provide further evidence of fertility decline in the Maldives.

5.1.1.1 Direct estimates of Fertility

The dearth of reliable demographic data on the populations of developing countries has prompted the development of several indirect techniques for the estimation of demographic measures from census and survey data.

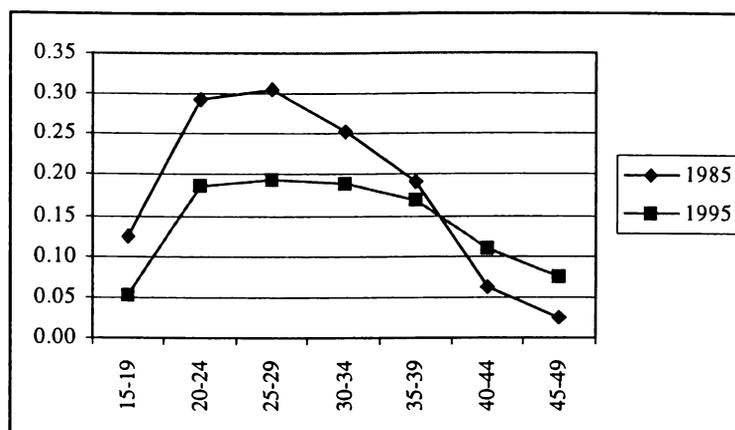
Information on the births in the past year and children ever born were collected in the censuses of 1985 and 1995. For the relevant questions that were included in the census see Appendix 1.

Table 5-1: Age Specific Fertility Rates (ASFR) and Total Fertility Rate (TFR) Based on Reported Births in the Past Year, Census Data, Maldives, 1985 and 1995

Age group	1985			1995		
	Live births	Women	ASFR	Live births	Women	ASFR
15-19	1312	10472	0.125	666	12562	0.053
20-24	2592	8866	0.292	2061	11077	0.186
25-29	1882	6166	0.305	1829	9389	0.195
30-34	992	3933	0.252	1476	7785	0.190
35-39	611	3178	0.192	1059	6317	0.168
40-44	191	3095	0.062	359	3297	0.109
45-49	83	3416	0.024	237	3215	0.074
Total	7663		1.253	7687		0.974
TFR			6.267			4.869

Source: Computed by the author

Table 5-1 shows the age specific fertility of women, as indicated from the number of live births reported to be born by women, in the year preceding the census, from the censuses of 1985 and 1995. Assuming that the level of reporting recent fertility has been consistent between the two censuses, these data indicate that the levels of fertility as indicated by the age specific fertility rates among all women under the age of 40 years have declined during the past decade. The most significant decline is seen among women in the age group 25 to 30, who are likely to start controlling their fertility. It is the effects of a rather rapid decline in the desired family size that is reflected in the lower levels of fertility among younger women in 1995 compared to 1985 (see Figure 5-2). These changes in the levels of fertility among younger women have meant that the age pattern of fertility has changed significantly during this period. The rapid decline in the levels of fertility among younger women would lead to a similar drop in the levels of completed fertility, with long-lasting implications for the age structure of the population (see Chapter 8 and Chapter 9 for a discussion of the present age structure and the projected changes). The higher age specific fertility rates observed for women 40 years of age and over in 1995 compared to 1985 may be caused either due to under-reporting of births among women in the higher ages in the previous census or an over-reporting in the recent census. The former appears to be more credible.

Figure 5-2: Fertility Patterns, 1985 and 1995 Censuses, Maldives

Source: Prepared by the author

In the absence of registration data on the number of births and deaths by age of women, information on recent fertility of women reported in the census of 1995 is also used to compute some other standard summary measures of fertility²³ (see Table 5-2). As shown in the table the direct estimates of fertility from the reported births in the year preceding the census indicate that fertility levels remain high in the Maldives. Table 5-3 shows the mean parities of women by five-year age groups from the data on lifetime fertility of women as reported in the censuses of 1985 and 1995.

Table 5-2: Summary Measures of Fertility from Reported Births in the Past Year, Census 1995, Maldives (By direct method)

Index	Rate
Total fertility rate (TFR)	4.87
Gross reproduction rate (GRR)	2.39

Source: Computed by the author

23 i) The Total Fertility Rate (TFR); which is an estimate of the total number of births that a woman would have if she were exposed to the present age pattern of childbearing throughout her reproductive life. ii) Gross Reproduction Rate (GRR); which is the number of daughters that a woman would have if she were exposed to the present age pattern of childbearing throughout her reproductive life. This is a more refined form of the TFR. Neither the TFR, nor the GRR takes in to account the mortality experience of the births occurring to women. Net Reproduction Rate (NRR) is the index of fertility that results when the effect of mortality is included in the GRR. It is the actual capacity of the rate of reproductivity in a population.

Comparison of mean parities of women in the reproductive ages between the two censuses shows evidence of fertility decline in the recent years in the Maldives. As expected, the parity increases steadily with the age of women, providing some assurance about the quality of data on children ever born in the two censuses.

Table 5-3: Children Ever Born per Woman, 1985 and 1995 Census, Maldives

Age group	1985			1995		
	CEB	Women	CEB per woman	CEB	Women	CEB per woman
15-19	4015	10472	0.383	1940	12562	0.154
20-24	17771	8866	2.004	14184	11077	1.280
25-29	22651	6166	3.674	25606	9389	2.727
30-34	20694	3933	5.262	32627	7785	4.191
35-39	21199	3178	6.671	33340	6317	5.278
40-44	21559	3095	6.966	19339	3297	5.866
45-49	24207	3416	7.086	19095	3215	5.939

Source: Computed by the author

5.1.1.2 Indirect Estimates of Fertility

Indirect techniques of demographic estimation fall into two categories. Those that are based on the information from the enumerated population, such as information on the age structure of the population, and others that use information that are specifically collected for the purposes of demographic estimation, such as the number of births in the past year, the number of children ever borne and number of children surviving to a woman.

Among the several methods of indirect estimation of fertility from information on the reported age structure of the population, the average annual growth rate of the population, and an estimate of the level of mortality, the 'stable population analysis' and the 'reverse survival method' are two most commonly used approaches (United Nations, 1983:162-182) (see Appendix 3). Comparing these estimates with the direct estimates from reported births in the census (CBR = 31.8) and the decline in the TFR from 1985 to 1995, one could assume that the latter estimates are more acceptable.

Indirect techniques of fertility estimation, using information on recent and retrospective fertility of women, namely, children ever born, children

surviving, and births in the past year, reported by women in the census (initially proposed by Brass, 1964; see Appendix 3), will be employed to derive further estimates of fertility in the Maldives. This information collected in surveys and censuses are known to be prone to two types of reporting errors. In the case of information collected in surveys and censuses on the fertility of women during a fixed time prior to the survey date, usually one year, the cause of reporting errors occur due to the difficulty of respondents to align a demographic event with a certain reference period. On the other hand, information on lifetime fertility of a woman is also subject to reporting errors. Such reporting errors are mostly due to problems in recalling past events, in this case births, that occurred a long time ago. Women over the age of 35 are more likely to under report their cumulative fertility as some of their children may have grown up and left home or some may have died long ago. These problems in the data should be kept in mind when using them for demographic estimation and interpretation of results.

Table 5-4: Estimates of Total Fertility by Brass Type Methods Using Data on Children Ever Born and Births in the Year Preceding the Census, Maldives, 1985 and 1995²⁴

Year	Method of Estimation			
	P/F Ratio Method (Trussell Variants)	Brass Relational Gompertz		Arriaga Method
		Based on CEB only	Based on CEB and ASFR	
1985	7.57	8.22	8.25	6.19
1995	7.45	6.28	7.35	5.58

Source: Computed by the author

Among the several modifications to the Brass (1964) method (see Appendix 3) Arriaga (U.S. Bureau of the Census, 1983) developed a technique that provides estimates of fertility even in the event of changing fertility. This method also has the capacity to use two sets of children ever born data and fertility patterns from two censuses, providing fertility estimates referring to the year of the census.

Table 5-4 shows estimates of TFR for the Maldives by different approaches using information on children ever born alive and reported live births in the year preceding the census, from 1985 and 1995 censuses. Bearing in mind the drawbacks involved in deriving indirect estimates of fertility from such data and the possible distortions that may arise in the estimated parameters due to violation of the underlying assumptions, it appears that, while fertility levels remain extremely high, there has been a decline in fertility in the recent past in the Maldives.

All the estimates, both direct (Section 5.1.1.1) and indirect (Table 5-4), point towards such a trend. While all indirect techniques are by their very nature subject to several drawbacks that have been discussed above, due to the relative advantages of Arriaga's method over other methods of estimating fertility from information on retrospective and current fertility of women, this technique is adopted as the most appropriate for the indirect estimation of fertility indices for the Maldives.

Arriaga's technique is applied to the population of Maldives using children ever born and reported births in the year preceding the census, classified by five year age group of women and from the 1985 and 1995 censuses. The adjustment factors used in adjusting the fertility levels are from the age group 20 to 29. The Total Fertility Rates Estimated by this method are given in Table 5-5.

Table 5-5: Total Fertility Rates by Arriaga Method, (Adjusted on the basis of age specific fertility of women in the age group 20-29), Maldives 1985 and 1995²⁵

Region	1985	1995	Absolute change
Total	6.190	5.580	0.610
Urban	4.620	3.480	1.140
Rural	6.770	6.540	0.230

Source: Computed by the author

24 See Arriaga (1994) for an explanation of these techniques.

25 1985 estimates refer to the period March 1985 to March 1986 and 1994 estimate refers to the period March 1994 to March 1995.

Consistent with the estimates discussed above, the fertility estimates obtained by the Arriaga method indicate overall fertility decline during the 10-year period between 1985 and 1995 although the decline is not very strong. As a whole, rural fertility decline has not been as rapid as urban fertility. This is expected, as the urban population is more exposed to socio-economic factors that are conducive for family size limitation than the rural population.

Mean parity is another indicator of the level of fertility in a population. Parity refers to the number of children born alive to a woman by a given age of her life (Shryock et. al., 1976:291). Mean parity therefore indicates the average number of children born to women by a certain age in a given population. Mean parity is therefore influenced by the age structure of a population. Table 5-6 shows the mean parities of women by region for census years 1985 and 1995 for the Maldives standardised on the basis of the age structure of women in the Maldives in 1995.

Table 5-6: Mean CEB Standardised (on the Basis of National Age Distribution of Women in 1995)

Indicator	1985			1995		
	Total	Urban	Rural	Total	Urban	Rural
Expected cumulative births	190,358	158,809	200,902	146,131	113,501	158,741
Number of women	53,642	53,642	53,642	53,642	53,642	53,642
Standardised mean parity	3.55	2.96	3.75	2.72	2.12	2.96

Source: Computed by the author

These mean parities provide support to the findings from the earlier estimates which indicate that fertility has declined significantly during the period 1985 to 1995. This is true for both urban and rural populations.

While it can be concluded that the fertility levels have declined in the past decade or so, these broad trends do not reveal the differentials in the levels of fertility that are likely to exist between different atolls of the country and between women with different socio-economic characteristics. An investigation of fertility differentials by atoll, by different levels of educational attainment, and different employment characteristics is essential to a better understanding of the patterns of fertility in the population.

5.1.2 Fertility Differentials

While the extent of fertility decline among the rural population has been smaller than among the urban population, it is unlikely that all the atolls have experienced similar patterns of fertility decline. Nor is it likely that the different socio-economic groups of women experienced similar levels and trends in fertility during the period of overall fertility decline.

5.1.2.1 Geographical Differences

There appears to be considerable variation in the levels of fertility between the different administrative divisions of the country. These variations have increased during the ten-year period between 1985 and 1995 reflecting the differences in the rates of fertility decline between the different divisions.

As seen in Table 5-7 the mean TFR for 1985 is 6.76 with a standard deviation of 0.73. While the mean TFR has declined to 6.49 by 1995 the standard deviation has increased to 1.65.

Of the 20 administrative atolls (rural areas) outside Male' island (urban area), fertility increase was observed in nine atolls. The other 11 atolls experienced fertility decline. In terms of the proportion of the population, those atolls that experienced fertility increase comprise one third of the total population of the country.

Bearing in mind that these estimates of fertility may be affected by errors in the data used to derive them, it is interesting to find that five out of the nine atolls that experienced fertility increase are clustered together in the southern part of the country. The only atoll in the south that experienced fertility decline during the period is Addu, which is also one of the more urbanised regions outside Male' island and which has a high proportion of their population employed in the tourism and other urban centred activities (see Chapter 11). It is likely that important socio-economic factors associated with the geographical location of these atolls have caused the unusual trends in fertility in the high fertility atolls. These may be differences in access to educational facilities, health care, and

employment opportunities outside the traditional subsistence fisheries and agricultural activities, that have caused continued high fertility in these atolls. These atolls may also be at the onset of fertility decline when fertility in the rest of the country has already started declining – a slight rise in fertility is known to occur immediately preceding fertility decline (Dyson and Murphy, 1985).

Table 5-7: Total Fertility Rates by Arriaga Method, (Adjusted on the basis of age group 20-29), Administrative Atolls, Maldives, 1985 and 1994²⁶

Atoll	1985	1995	Change
North Thiladhummathi	6.780	6.310	-0.470
South Thiladhummathi	6.860	7.280	+0.420
North Miladhummadulu	6.790	5.890	-0.900
South Miladhummadulu	6.990	6.280	-0.710
North Maalhosmadulu	7.370	7.980	+0.610
South Maalhosmadulu	6.640	4.660	-1.980
Faadhippolhu	6.370	5.020	-1.350
Male' Atholhu	7.870	5.820	-2.050
North Ari	7.080	5.850	-1.230
South Ari	6.830	7.370	+0.540
Felidhu Atholhu	5.930	7.230	+1.300
Mulakatholhu	6.940	4.750	-2.190
North Nilandhe	8.310	8.000	-0.310
South Nilandhe	6.510	5.330	-1.180
Kolhumadulu	6.990	7.080	+0.090
Hadhdhummathi	6.280	9.810	+3.530
North Huvadhu	7.320	8.780	+1.460
South Huvadhu	7.060	8.990	+1.930
Foammulaku	6.500	6.670	+0.170
Addu	5.950	3.760	-2.190
Male' island	4.62	3.48	-1.14
Mean TFR	6.76	6.49	-
Standard deviation	0.73	1.65	-

Source: Computed by the author

²⁶ Same as footnote for Table 5-5.

5.1.2.2 Differentials by Educational Levels

When analysing educational differentials the mean number of children ever born per women in the census is used as an indicator of fertility. Education is a variable that is strongly associated with the age of a person. In societies where higher levels of schooling of females have prevailed for a long time, those women in the early ages of childbearing are likely to have attained lower levels of education than those in their late 20s. On the other hand, in developing countries such as the Maldives, where opportunities for modern formal education have not been available to the majority of the population until recently, older women are less likely to have gone through the formal schooling system. In fact, the older a woman is, the more likely it is for her to be reported in the 'no grade' categories. Mean parities of women classified by their level of educational attainment are prone to the effects of such distortions (see Table 5-8).

Table 5-8: Mean Parities by Level of Educational Attainment of Women, Maldives, 1985 and 1995

Level of educational attainment	Mean children ever born (parity)				
	Reported		Standardised		Change
	1985	1995	1985	1995	
No grade attained (< grade 1)	3.98	4.17	3.56	3.06	-0.50
Primary level (grades 1 – 5)	3.30	2.80	3.64	2.86	-0.78
Middle level (grades 6 – 7)	1.43	1.00	3.06	2.25	-0.81
Secondary level (grades 8 – 10)	0.95	0.50	2.02	1.48	-0.54
Advanced level (grades 11 – 12 and above)	0.75	0.68	1.10	1.09	-0.01

* Standardised on the basis of female population by five year age groups for Maldives, 1995

Source: Computed by the author

The mean number of children ever born by level of educational attainment of women are standardised on the basis of the age distribution of women in the five-year age groups between 15 and 49 years in the total population in 1995. It can be seen in Table 5-8 that the standardised average parities decreases steadily with the level of education. It can also be seen that there has been a decline in fertility across all educational levels between 1985 and 1995.

Most change appears to have occurred in the primary and middle education levels, with the biggest change being in the middle education category. This

could be explained by the recent improvements in schooling availability in the atolls, keeping young women longer in school even after reaching their 15th birthday. The other reason is that the completed fertility of women with higher levels of education was low in 1985 thus leaving little scope for further fertility reduction.

Table 5-9: Total Fertility Rates by Educational Attainment, Arriaga Method (Adjusted on the Basis of Age Group 20-29), Maldives, 1985 and 1995

Educational level	Total Fertility Rate	
	1985	1995
No education	6.630	6.860
Primary level (1-5)	6.820	6.020
Middle level (6-7)	5.860	3.730
Secondary level (8-10)	3.380	1.470
Advanced level (11-12)	2.580	1.380

Source: Computed by the author

The effect of education on fertility can be seen more clearly from the TFRs by level of educational attainment of women. Table 5-9 shows the TFRs computed for women whose highest level of educational attainment falls in a given category for the census years 1985 and 1995. These estimates are derived indirectly from data on children ever born and number of births in the year preceding the census by five-year age group of women. The technique used is, once again, the Arriaga technique and the resulting estimates are subject to errors due to possible inaccuracies in the data and the violation of assumptions behind this technique explained earlier in this chapter.

It can be seen that the TFRs for all educational levels, except for those women with no education, have fallen dramatically over the ten-year period. These rates also provide some evidence to the hypothesis that fertility increases slightly for women with little education compared to women with no education, especially in high fertility situations due to such factors as shortening of postpartum breastfeeding and greater control for educated women in reaching their desired fertility goals (see Bledsoe *et al.*, 1999 and references therein). For both census years, among the different educational categories of women, the highest fertility is observed for women in the primary education category. Slightly higher education seems to have a major effect on

the fertility of women. It is clear from Table 5.10 that the spread of education, especially secondary education in the Maldives is having a substantial indirect impact on fertility reduction.

5.1.2.3 Differentials by Labour Force Status

The working age population is divided into three broad categories – employed, unemployed, and not economically active. Those who are employed and those who are unemployed (also referred to as active job seekers) during a given reference period constitute the labour force. Conversely, those not economically active during the reference period and not temporarily out of active employment are termed as not in the labour force (see Chapter 7 for a detailed discussion of definitions).

Following these definitions, the proportion of unemployed persons is generally very low in the Maldives. This is more so among women, especially in the atolls. In 1985, out of a total of 38,441 women in the age group 15-49, only 81 women were classified as unemployed (0.2 percent). The corresponding figure for 1995 was 221 out of 53,144 women (0.4 percent).

As can be seen from Table 5-10 the vast majority of women in the Maldives fall into the not economically active category. The numbers in the unemployed category are negligible in comparison with the other two categories. Due to these small numbers in the unemployed category, the estimates of fertility obtained for this category of women is likely to be affected.

Table 5-10: Women in Ages 15-49 by Labour Force Status, Maldives, 1985 and 1995

Labour force status	1985		1995	
	Number of Women	%	Number of Women	%
Employed	9,083	23.63	14,761	27.78
Unemployed	81	00.21	221	00.41
Not Economically Active	29,277	76.16	38,162	71.81
Total	38,441	100.00	53,144	100.00

Source: Computed by the author

As seen in Table 5-11 employed females in the Maldives have significantly lower fertility compared to not economically active women. This is the expected trend as employed women are more likely to be better educated, more exposed to views of others, and more conscious of the effects of high fertility on their lives (see for example, Dyson and Moore, 1983).

Table 5-11: Total Fertility Rates by Labour Force Status, Arriaga Method (Adjusted on the Basis of Age Group 20-29), Maldives, 1985 and 1994

Labour force status	Total Fertility Rate	
	1985	1994
Employed	4.98	4.20
Unemployed	5.14	6.07
Not economically active	6.74	6.59

Source: Computed by the author

It can be seen that fertility of both, employed women and women not in the labour force, has declined slightly between 1985 and 1995. The decline is, as expected, more pronounced for employed women, for the reasons mentioned above. The increase in the fertility of unemployed women can only be attributed to the small numbers of women in this category²⁷.

5.2 Reproductive Health

Since the 1980s the government has run a national Child Spacing Programme targeted at improving the health of women and children, through planned and well-spaced pregnancies and safe childbirth. Family planning methods and information are provided at the national level under this programme. In the past it has operated through the primary health care infrastructure and has only been accessible to married couples until recently, when a significant policy change has made condoms more easily accessible by making them available through pharmacies (Ministry of Health, 1997). Data from different sources, to be discussed below, indicate that contraceptive use is increasing.

²⁷ The 81 unemployed women reported 11 live births in the preceding year in the 1985 census, while the 221 women in 1995 reported 15 live births.

A single question was asked of all currently married women who were not pregnant at the time of the 1995 census, as to whether or not they were using any method of contraception. A Contraceptive Prevalence Rate (CPR) was calculated on the basis of this information for different socio-demographic categories of women. While appreciating that there may be some extent of underreporting for this question, for the purposes of the present analysis it is assumed that the extent of under reporting was uniform across all socio-economic categories of women (see Table 5-12).

Table 5-12: Age Specific Contraceptive Prevalence Rates by Levels of Education for Eligible Women²⁸, Maldives, 1995.

Age group	Educational attainment					Total
	No grade	Primary	Middle	Secondary plus	Not stated	
15-19	0.1864	0.1998	0.1689	0.1582	0.1724	0.1836
20-24	0.2870	0.2865	0.2655	0.2481	0.2419	0.2766
25-29	0.3505	0.3490	0.2946	0.3195	0.3481	0.3401
30-34	0.3539	0.3505	0.3184	0.3688	0.3043	0.3501
35-39	0.3187	0.3187	0.3502	0.4571	0.2794	0.3230
40-44	0.2346	0.2142	0.2750	0.2963	0.2375	0.2315
45-49	0.0251	0.0411	0.0759	0.0278	0.0241	0.0308

Source: Computed by the author

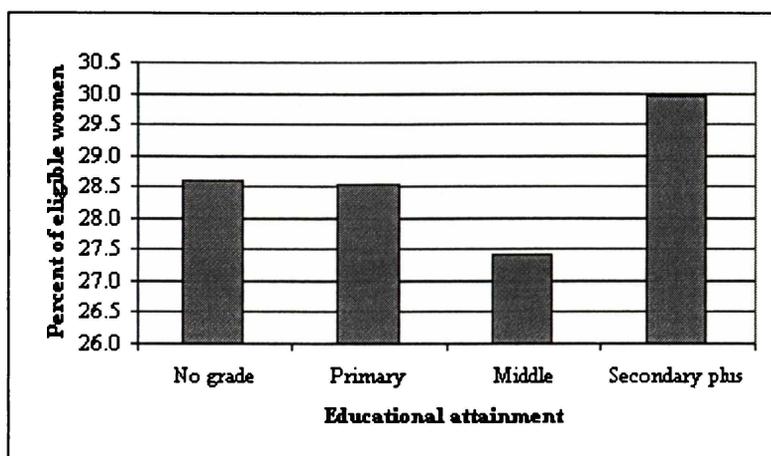
On the basis of this analysis of census data it was found that 31.7 percent of currently married women were using a method of contraception in 1995. A Knowledge Attitude and Practice (KAP) survey conducted in the Maldives in 1993 estimated a CPR of 23 percent (Ministry of Planning, Human Resources and Environment, 1998). Assuming that the estimated CPR from the KAP Survey is a representative figure for the whole population, one could compare it with the CPR computed from the census. This indicates a marked improvement in the use of contraception in the Maldives from 1993 to 1995.

Data on the age pattern of contraceptive use (Table 5-12) indicate that women in the age group 30 to 34 comprise the highest proportion of users in 1995 (35 percent). The lowest proportion of users was in the age group 45 to 49 (3 percent). This is expected, as many women in this age group would have already completed their reproductive span. Women in the youngest age group

²⁸ The question on contraception was asked only from all currently married women over age 15 who were not pregnant at the time of the census.

(15 to 19) have a very low user rate of only 18.4 percent. From then on, the proportion of users rise sharply by age.

Figure 5-3: Contraceptive Prevalence Rate by the Educational Attainment of Eligible Women, Standardised on the Basis of Age Distribution of all Eligible Women, Maldives, 1995

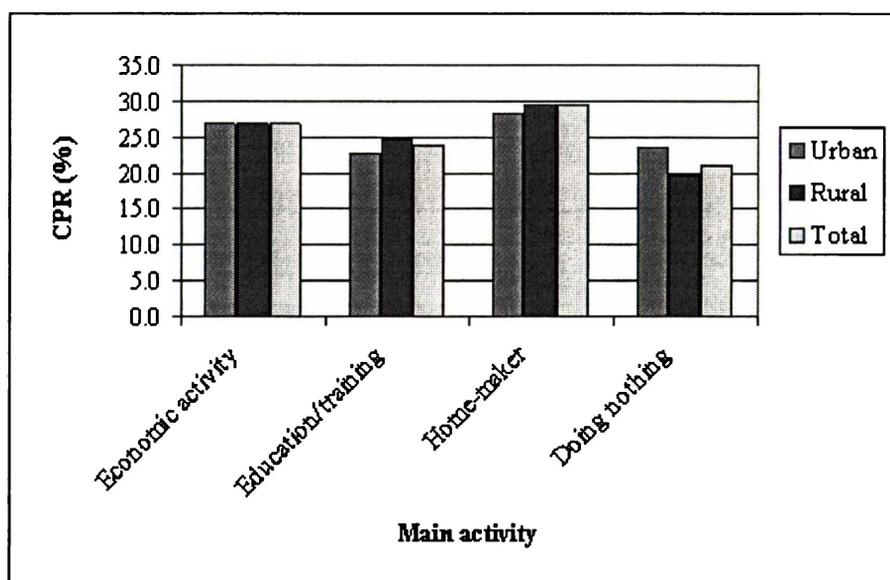


Source: Prepared by the author from 1995 census data

The contraceptive prevalence rates by educational attainment of eligible women (currently married women aged 15 years and over and not pregnant at the time of the census), standardised on the basis of the age distribution of all eligible women, indicates that contraceptive use was marginally higher among women without any education and those with primary level schooling than those with middle school levels of attainment (Figure 5-3). However, it was significantly higher among eligible women with secondary or higher levels of education than for any other group of women. Nevertheless, it can be seen from Table 5-12 that among women under age 30, the less educated are more likely to use contraception than the more educated.

Age standardised contraceptive prevalence rates by main activity (Figure 5-4) show contraceptive use is highest among the group of women who were reported to be home-makers during the reference period, both in the urban and the rural areas. The next highest contraceptive prevalence rates were for those who were engaged in income earning activities. For this group of women, there appears to be no difference in the prevalence rates between the urban and the rural areas.

Figure 5-4: Contraceptive Prevalence Rate by Main Activity During Reference Week for Eligible Women, Standardised on the Basis of Age Distribution of All Eligible Women, Maldives, 1995



Source: Prepared by the author from 1995 census data

It must be pointed out that eligible women being those who are currently married but not pregnant, none of them will be currently attending formal schools²⁹. Those who reported their main activity to be education or training are those who were attending either tertiary level courses at various institutions, or some form of vocational training (table not shown), thus, having significant levels of contraceptive use while they are attending education or training.

5.3 Family Formation - Marriage Patterns and Differentials

In the Maldives, the prevailing laws and customs do not permit consensual unions, and childbearing out of wedlock is considered an illegitimate and a punishable offence. In such societies the time of entry into, and subsequent stability of marriage are, undoubtedly, important factors in determining the completed family size of an individual (Bongaarts, 1978). The collective effect of the age at which individuals in a society enter into marriage will have long-lasting impacts on the fertility rate of that society. The effect will be especially

²⁹ A married woman cannot attend formal schooling (primary, secondary, or advanced levels) in the Maldives.

significant in the absence of widespread use of conscious measures of fertility control (Davis and Blake, 1956).

5.3.1 Marriage and Divorce in the Maldives

Being virtually a one hundred percent Sunni Muslim nation, marriage and divorce in the Maldives are practiced in accordance with the Islamic Laws. A unique blend of historical and cultural practices, and of island and religious influences appear to have resulted in a somewhat distinct marriage pattern in the country (Miralao, 1991:3). Similar to the other nations of the South Asian region, early marriage prevailed in the Maldives in the past. Some researchers have traced the custom of early marriage in the Maldives to the earlier practise of arranged marriages (Maloney, 1980; cited from Miralao, 1991), which is only rarely seen in the Maldives of the 1990s. As pointed out in the report of the survey of island women (National Planning Agency, 1980:37), 'the high incidence of remarriage indicates that divorce often takes place due to temporary conflicts...both marriage and divorce are rather inexpensive and involve only simple formalities, thus explaining the frequency of both'. Miralao (1991) suggests that the 'Maldives' lax interpretations of Islamic rules on divorce...allow men to divorce their wives at will'. These practices have made the early marriage rates and divorce and remarriage rates in the Maldives one of the highest in the world (Chaudhury, 1996). However, more recent data from the census of 1995 indicate that these trends may be changing both in the urban, as well as, the rural Maldives.

Even if the age at marriage has increased in the recent years, the high rate of marital disruptions is an area of major concern, both at the level of the society and at the level of the policy makers. The high rate of marital failure is mainly due to the abuse of traditional powers that men have over their wives and with it, the power to divorce their wives at will. Women, on the other hand, do not have equal powers to divorce their husbands.

5.3.2 Marital Status Trends

5.3.2.1 Age at First Marriage

Mean age at first marriage is a commonly used measure of the timing of marriage in a population. An indirect method of estimating the mean age at first marriage is the singulate mean age at marriage (SMAM). It is the mean age at first marriage among those who ever marry or more appropriately those who marry by a predetermined age. The SMAM is calculated on the basis of the proportions that are single in each age group, assuming that no first marriages occur before age 15 and after age 50 (Hajnal, 1953:111-136). The detailed description of the procedure for the computation of the SMAM is given in Manual X (United Nations, 1983). The SMAM calculated under the assumption that no first marriages occur after the age 50 thus gives the average number of years spent in the single state by those who marry before age 50.

Table 5-13: Singulate Mean Age at Marriage by Sex, Maldives, 1985 and 1995

Sex	1985	1995	Absolute change
Males	22.04	23.58	1.54
Females	17.90	18.57	0.67
Difference	4.14	5.01	

Source: Computed by the author from census data

The SMAMs computed from the 1985 and 1995 census data in Table 5-13 indicates that there has been an increase in the age at first marriage during the 10-year period. The increase is higher for males than for females and due to this, the difference in the mean ages at first marriage has increased slightly. On average, males were between four to five years older than females at the time of their first marriage.

The data presented above are cross-sectional, but this presents some problems. Under conditions of stability, the singulate mean age at marriage should refer to the marital experience of a birth cohort (United Nations, 1983:227). Unfortunately data on the marital experience of a birth cohort is not normally

available and the data on proportions single in a given age group refer to a cross-section of the population. It is possible that in the event of rapidly changing marriage patterns, there may be fluctuations in the proportions single from one age group to the other. In such a situation the United Nations Manual X proposes a method of calculating SMAM using proportions single in a hypothetical cohort exposed to the changing first marriage patterns between two censuses five or ten years apart (United Nations, 1983:227).

Table 5-14: Singulate Mean Age at Marriage for the period 1985-1995

Region	Females	Males	Difference
Urban	21.0	24.9	4.0
Rural	18.2	23.1	4.8
Total	19.0	23.8	4.8

Source: Computed by the author from census data

On the basis of the marriage experiences of hypothetical cohorts for the period 1985 to 1995, singulate mean ages at marriage were computed for the Maldives and for the urban and the rural populations separately (see Table 5-14). These estimates indicate that during the period, the SMAM was 19.0 years for females and 23.8 years for males, a difference of almost 5 years. There were significant differences in the SMAM between the urban and the rural populations, especially among the females. The SMAM for urban females was 21 years and for rural females, 18.2 years. For males in urban areas it was 24.9 years compared to 23.1 for rural males. The difference in SMAM for females between rural and urban areas was close to three years while for males the difference between rural and urban areas was two years.

5.3.2.2 Marital Status

Cross sectional data from the censuses of 1985 and 1995 suggest that, although the proportions divorced or widowed remains high among both males and females, marital stability may be increasing in the Maldives in the recent past. The proportions divorced or widowed declined significantly for both sexes across all age groups during the intercensal period; except for females in the age group 30-39 for whom there appears to be no significant change.

Table 5-15: Percentage Distribution of the Ever Married Population by Marital Status and Sex, 1985 and 1995 Censuses, Maldives

Age Group	Females				Males			
	Married	Divorced/ Widowed	Total Ever-married		Married	Divorced/ Widowed	Total Ever-married	
			Percent	Number			Percent	Number
1985								
15-19	79.5	20.5	100.0	5352	75.0	25.0	100.0	1051
20-24	85.4	14.6	100.0	8137	80.6	19.4	100.0	5274
25-29	88.8	11.2	100.0	6019	87.4	12.6	100.0	5510
30-34	90.0	10.0	100.0	3901	89.4	10.6	100.0	4061
35-39	89.1	10.9	100.0	3163	90.8	9.2	100.0	3396
40-44	85.3	14.7	100.0	3075	87.3	12.7	100.0	3310
45-49	83.0	17.0	100.0	3401	86.4	13.6	100.0	4012
50-54	73.2	26.8	100.0	2754	84.5	15.5	100.0	3371
55-59	64.9	35.1	100.0	1609	81.0	19.0	100.0	2497
60+	35.0	65.0	100.0	3374	67.9	32.1	100.0	4954
1995								
15-19	89.5	10.5	100.0	2739	85.2	14.8	100.0	243
20-24	90.2	9.8	100.0	8296	91.8	8.2	100.0	2640
25-29	89.7	10.3	100.0	8452	92.6	7.4	100.0	5219
30-34	89.7	10.3	100.0	7252	93.7	6.3	100.0	5596
35-39	88.7	11.3	100.0	5953	94.0	6.0	100.0	5074
40-44	86.8	13.2	100.0	3096	94.1	5.9	100.0	2927
45-49	83.4	16.6	100.0	3044	92.3	7.7	100.0	2705
50-54	75.6	24.4	100.0	2851	89.4	10.6	100.0	2627
55-59	69.8	30.2	100.0	2605	86.3	13.8	100.0	2720
60+	48.8	51.2	100.0	4282	68.6	31.4	100.0	6990

Source: Computed by the author

The rapid decline in the proportions divorced in the young adult ages, as seen in the numbers of evermarried persons, is likely to be caused by the increasing age at first marriage during the intercensal period. These patterns of changes in marital status are likely to be different for different regions and by the level of educational attainment of individuals.

5.3.3 Marital status Differentials

Some of the trends in the marital status by gender and region of enumeration of the population indicate the possibility that marital status differentials according

to various socio-economic subgroups are important in getting a clearer understanding of these trends. The analysis presented in the following sections will be based on the singulate mean ages at marriage by region, sex and level of educational attainment of individuals.

5.3.3.1 Differentials by Region and Sex

Some of the aggregate level trends discussed earlier in this chapter based on the singulate mean ages at marriage computed from cross-sectional data on the proportions single by age group showed increasing age at first marriage in the country. Thus we compute the singulate mean age at marriage computed for the period 1985 -1995. SMAM computed for the different regions of the Maldives by gender using this method are given in Table 5-16.

Table 5-16: Singulate Mean Age at Marriage for Hypothetical Cohorts by Regions of Maldives, 1985-1995

Region	Singulate Mean Age at Marriage (in years)	
	Females	Males
North Thiladhummathi	18.5	22.5
South Thiladhummathi	18.2	22.3
North Miladhummadulu	18.5	22.2
South Miladhummadulu	18.0	22.2
North Maalhosmadulu	18.7	22.9
South Maalhosmadulu	19.4	23.3
Faadhippolhu	19.1	25.0
Male' Atholhu	17.8	23.9
North Ari	17.2	22.5
South Ari	17.8	23.3
Felidhu Atholhu	17.1	22.7
Mulakatholhu	18.8	23.3
North Nilandhe	17.1	20.9
South Nilandhe	18.3	22.1
Kolhumadulu	18.3	22.2
Hadhdhummathi	17.3	21.1
North Huvadhu	17.5	21.8
South Huvadhu	18.5	22.0
Foammulaku	17.8	22.9
Addu	18.7	23.6
Male' Island	21.0	24.9

Source: Computed by the author

These estimates show significant differentials in the SMAM between sexes but the differentials are more or less standard across all administrative divisions. The differences are less than that was expected since it was fairly recently that it was quite normal for a man to marry a woman who is considerably younger than his age. This seems to have changed quite significantly in the recent past.

There are significant differences between the various administrative regions of the country. For instance, for females, at the lowest end of the first marriage age are Felidhu Atholhu and North Nilandhe Atholhu (atolls that are located in the central region towards the south of Male' Atholhu. At the higher end (excluding Male' island) are two atolls located north of Male' Atholhu – Faadhippolhu and South Maalhosmadulu. These two atolls have been known for the high value attached to education and contains some of the oldest educational institutions in the country (author's personal observations). Thus, the relatively high ages at first marriage in these atolls can be associated with the effects of schooling.

5.3.3.2 Differentials by Educational Attainment

Education is an important factor that is known to affect the age at first marriage in a society (Islam and Ahmed, 1998). It is expected that with higher educational attainment, age at first marriage will rise. In the context of the Maldives, delayed marriage may be attributed largely to the spread of educational opportunities to the far-flung islands of the Maldives and the growth in the job market created by the growth and diversification of the economy. The availability of educational opportunities in their own islands have allowed children who could not otherwise afford schooling, or who were unable to travel to other islands for schooling due to societal factors, to attend and remain in school until they were older, thereby delaying the age at first marriage considerably. Differentials in the mean age at first marriage by educational attainment is measured by the singulate mean age at marriage for the hypothetical cohort of 1985 to 1995 at different levels of education. The results are given in Table 5-17.

Mean ages at marriage by educational levels and region reveal some interesting insights about the differentials in the age at first marriage between males and females. It can be seen that in the urban area, as well as in the rural areas, differences in the age at first marriage between males and females appear to be highest among the population that has not attained any level of education. The difference is greater in the urban area, where there was a difference of over seven years. In the rural areas the difference was about five years. These differences are caused by a higher marriage age for males with no education in the urban area compared with the rural areas and a lower marriage age for females in the urban area compared with the rural areas.

The mean age at marriage for males, as well as females in both Male' and atolls seem to increase with higher levels of educational attainment. The only exception appears to be males in Male', where the mean age at marriage for males with primary level of education seems to be slightly lower than for those without any level of education attained. Again, the age difference seem to be higher for those with higher secondary level education than those with secondary level education in Male' and for those with secondary level education than those with middle level education in the atolls.

Table 5-17: Singulate Mean Age at Marriage during 1985-95 by Regions, Educational Attainment and Sex

Region	Education	Males	Females	Difference
Urban				
(Male')	No education (0 grade)	24.0	16.7	7.4
	Primary (grades 1- 5)	23.9	19.6	4.2
	Middle (grades 6 - 7)	24.8	20.8	4.1
	Secondary (grades 8 - 10)	26.0	22.6	3.5
	Higher Secondary (grades 11-12)	27.7	23.5	4.2
Rural				
(Atolls)	No education (0 grade)	22.3	17.4	4.9
	Primary (grades 1- 5)	22.9	18.1	4.7
	Middle (grades 6 - 7)	23.8	19.7	4.1
	Secondary (grades 8 - 10)	25.2	20.7	4.5
	Higher Secondary (grades 11-12)	27.8	-	-
Total	No education (0 grade)	22.8	17.7	5.1
	Primary (grades 1- 5)	23.2	18.4	4.9
	Middle (grades 6 - 7)	24.4	20.2	4.3
	Secondary (grades 8 - 10)	25.8	22.6	3.2
	Higher Secondary (grades 11-12)	27.5	24.2	3.4

Source: Computed by the author from census data

Higher secondary education was introduced in the atolls only during the 1990s and hence, very few females were found in this educational category in the atolls at the 1995 census. Due to the small numbers, estimates of SMAM in this category, for females in the atolls by the hypothetical cohort method may not be robust.

It is clear from the above analysis that there is a positive association between age at first marriage and educational attainment in the Maldives. Providing easy access to schooling opportunities at the secondary and higher secondary levels is likely to advance the age at first marriage of both females and males, thereby affecting their fertility. The affect of age at first marriage on fertility is especially important in a society such as the Maldives where virtually all births occur within wedlock.

5.4 Summary and Conclusions

Attempt is made in this section (also relevant for summary and conclusions of other chapters in Part B) to provide a summary of the findings. In doing this some conclusions and micro-level inferences will be drawn in order to facilitate the related discussions elsewhere in this thesis. It should be pointed out that to the extent that data are available, multivariate analysis would be conducted to investigate the micro-level inferences presented here.

Levels and trends of fertility and family formation have been changing in the Maldives in the recent past. While the fertility levels remain high, both direct and indirect estimates show that fertility has been declining in the Maldives during the past decade or so.

Out of the 20 different administrative divisions of the country, fertility increased in nine rural areas. The rest of the regions experienced significant declines in the levels of fertility. Socio economic differentials between the regions that experienced fertility increase and those that experienced fertility decline may be important in the differences in fertility trends between different regions.

Fertility differentials by education suggest that the availability of schooling in the rural areas has perhaps been the most important factor of fertility decline in the Maldives. This is probably due to the effects of schooling on delayed marriage and contraceptive use associated with higher levels of schooling of females. Perhaps a more important factor may be the higher cost of child rearing as increasing demand for education is likely to lead couples to prefer child quality over quantity (see Becker, 1960, 1981; Willis, 1994; Shultz and Tomes, 1976).

Urban rural age patterns of parity of women suggest a preference for smaller families in the urban area than in the rural areas. Since urban women appear to have initiated the preference for smaller families, and since some atolls in the Maldives have also experienced fertility decline this suggests that fertility decline is well under way in the Maldives.

Employed females were found to have significantly lower fertility than those who were not in the labour force. This trend is expected since employed women are more likely to be educated and more exposed to influences outside the family (Standing, 1978; Bledsoe et al., 1999).

The present analysis also suggests that there is higher potential for rural women to marry early and have children early, thus increasing the likelihood of larger completed family sizes compared to urban women. The potential for early marriage and early child bearing is less for urban women.

Age at first marriage, or the singulate mean at marriage (SMAM) has increased significantly in the past decade or so. The increase is greater for females than males. There is an average age difference of four to five years between the age at first marriage for males and females in the Maldives. The availability of schooling and educational attainment appears to be a key factor in increasing age at marriage. Delayed marriage is likely to have played a significant role in the observed declines in fertility during the past decade or so.

Another important change in nuptiality patterns has been the increasing marital stability in the recent past. The proportions currently married and proportions

divorced by age group suggest that this pattern is more evident among the younger age groups. It is unclear as to what effect has increasing marital stability had on the fertility levels in the Maldives. There is conflicting international evidence on the effects of marital disruption of fertility (Harewood, 1984; Downing and Yaukey, 1979; Tabutin, 1979).

In addition to the effects of delayed marriage, the indirect effects of the national programmes aimed at improving the health of women and children, through improved child spacing, are also likely to have influenced the overall levels of fertility. Probably as a result of the maternal and child health (MCH) programmes, the demand for contraception increased. The positive association found between contraceptive use and higher levels of schooling suggests that the increasing levels of educational attainment, especially of women would have a profound effect on fertility levels in the immediate future. A factor related to education is labour force participation of women that was also found to have a positive effect on the levels of contraceptive use.

In sum, changes in the levels of fertility in the Maldives in the past decade or so has been effected by developments in the availability of schooling, improvements in the accessibility of contraception, and changes in the age at first marriage throughout the country. In addition to the effects on fertility, increasing levels of schooling will enhance the quality of labour force by improving the quality of human capital.

Fertility has been the key factor in the rapid growth of population in the recent past. This has been due to the rapid decline in the levels of mortality that has occurred prior to the beginning of fertility decline. Having reviewed the levels and trends of fertility, we will now turn to an analysis of the levels and trends of mortality and health in the Maldives in the recent past. This will be the focus of the next chapter.

Chapter 6: Mortality Trends and Differentials in Relation to Health and Nutrition

Perhaps the most important demographic change that has been associated with socio-economic developments in the developed, as well as the developing countries, has been the falls in the levels of mortality, especially in the early infancy and childhood. In low income developing countries that have achieved low levels of mortality, factors such as the education of women, access to primary health care, and levels of access to better nutrition have been seen to contribute significantly to the reductions in infant and childhood mortality (Caldwell, 1986; Schultz, 1993; Ram and Schultz, 1979). Health and mortality are also important inputs of the quality of human capital (Jones, 1992; Gundlach, 1999). Attempt will be made in this chapter to provide a macro-level analysis of the levels, trends, and differentials in health and mortality in the Maldivian society.

Socio-economic developments that have occurred in the Maldives during the past three decades or so, have accompanied improvements in the accessibility to primary health care and near universalisation of childhood immunisation (Ministry of Health and Welfare, 1996) leading to rapid declines in the infant and childhood mortality. Programmes aimed at creating awareness on issues such as preventive health care, nutrition, pre-natal health, and general hygiene, combined with the improvements in the delivery of health services are also likely to have contributed significantly to the improvements of the survival chances of children and mothers.

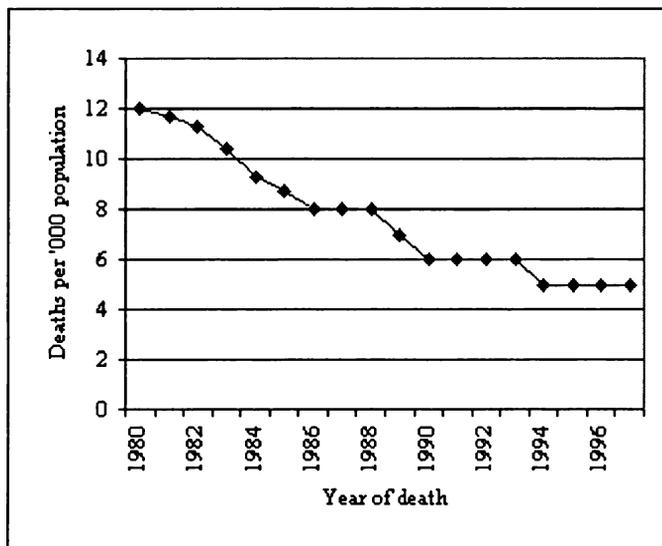
Data from the censuses of 1985 and 1995 will be used to obtain indirect estimates of mortality using established demographic techniques. Direct measures based on published registration data will also be used to compare with the indirect estimates. Discussion of the health and nutrition levels will be based on published data from other sources.

6.1 Mortality

6.1.1 Mortality Trends

Similar to other high fertility and high mortality populations of the world, the greatest force of mortality in the Maldives was experienced at the very young ages and among women in the childbearing ages. Registration data shows that as late as the beginning of the 1980s, infant mortality was still 94 per thousand live births and the crude death rate was 12 per thousand of the population. Since then, both these rates have fallen dramatically: infant mortality of 27 in 1997 and crude death rate of 5 in 1994. The crude death rate remained at 5 for the next four years.

Figure 6-1: Crude Death Rates, Maldives, 1980 to 1997



Source: Computed by the author from Statistical Yearbooks of Maldives, various years

While the possibility of under-registration of births cannot be ruled out, demographic techniques of evaluation suggest that the registration of deaths is likely to be of reliable quality in the Maldives (see Chapter 4). However, since death registration data is only available at the national level, it can only provide indices of the levels and trends of mortality. Indirect methods of mortality estimation that uses data on children ever born and children surviving from censuses are used to estimate the differentials in the infant mortality and expectation of life at birth from the censuses of 1985 and 1995.

The most useful of these methods have been described in the United Nations' Manual X: Indirect Techniques for Demographic Estimation (United Nations, 1983). Estimates of mortality and fertility derived from indirect techniques are known to be normally higher than those obtained by direct computations. This factor should be taken into account when interpreting the results from indirect estimation techniques.

Infant mortality and the expectation of life at birth and an estimate of the mean age of childbearing in a given population can be computed for various points in the past, using data on children ever born and children surviving by five-year age group of women. The censuses of Maldives, in following the recommendations of the United Nations, have been collecting information on the number of children ever born and the number surviving for all women in the childbearing ages, in all censuses conducted in the country since 1977.

Brass (1964, cited from United Nations, 1983:73) was the first to develop a procedure for the indirect estimation of probabilities of dying before attaining a given childhood age, from information on children ever born and surviving reported by women classified by five year age groups. This method was later refined by Sullivan (1972) and again by Trussell (1975). The general theory on which these methods are based is essentially the same, but they arrive at somewhat different multipliers because different databases were used in each case (United Nations, 1983).

Feeney (1976, 1980) also modified the original technique developed by Brass. While Brass type methods assumed constant fertility and mortality in the past, Feeney's method assumed a linear mortality decline. Otherwise these methods are more or less similar (Arriaga, 1994:104).

Palloni and Heligman (1985) also developed a technique using the same basic concepts and assumptions used in the original technique developed by Brass. Under the assumptions of constant fertility and constant mortality in the recent past, they developed improved regression equations for the transformation of proportions of surviving children out of all children ever born to a woman, into

measures of infant, early childhood and adult mortality (Palloni and Heligman, 1985).

Apart from the assumptions of constant fertility and mortality, the other assumptions made were - that there is no relationship between mortality of mothers and mortality of their children or between age of mother and parity or between age of mother and child mortality; that the age of mother is reported correctly; that completeness of reporting is the same for children ever born as for children surviving; and that the correct mortality model has been used. The Palloni-Heligman method used United Nations mortality models instead of Coale and Demeny (1966) life tables as the latter incorporated only a few empirical life tables that represent the mortality experiences of developing countries and thus reducing its validity for estimating mortality in developing countries. The United Nations (1982) published a new set of life tables that were based upon, and hence more applicable to, the mortality conditions and structures that are found in the developing countries (Palloni and Heligman, 1985).

For the United Nations Models, four distinctive patterns of mortality that were predominant to particular geographic regions of the world were identified: The Latin American model, the Chilean model, the South Asian model, and the Far Eastern model. According to Palloni and Helligman (1985), a fifth model, which is named the General model, can be seen as an average of the four regional models. For a more elaborate discussion of these models and the Coale and Demeny models see United Nations (1983).

There are two main types of errors that may arise in carrying out indirect estimation procedure. One is due to age misreporting by women, and can be of two forms, each having quite different effects on the transformation that converts a survivorship statistic into a probability of surviving (or dying). It can either be in the form of systematic age over-statement or under-statement, or it can be in the form of a preference for certain digits, say 0 or 5, when reporting age.

The second form of errors in the estimates is due to the violation of the assumption of constant mortality. If mortality in the past has been declining, the transformation of children ever born and children surviving data into pure mortality measures will overestimate the current value of probability of dying before a certain age. The bias will increase as the children's length of exposure to past mortality risks increases causing the bias to be higher for older mothers and for populations with an earlier child bearing pattern. Although the resulting estimates under conditions of declining mortality may not necessarily be good indicators of current mortality, they are acceptable indicators of cumulative mortality risks during the past (Palloni and Heligman, 1985). In fact, when life expectancy increases linearly, estimate of probability of dying is a good measure of the actual value of the probability of dying in the life table that applied some years before (Feeney, 1980).

Infant mortality rates and expectations of life at birth are calculated from the reported children ever born and children surviving by age of mother from two censuses, 1985 and 1995. The appropriateness of the United Nations South Asian mortality model for the population of Maldives, and the limitations of the indirect technique for mortality estimation that employ these life tables is to be borne in mind when interpreting the results from indirect techniques of estimation. Of particular significance are the gaps between direct estimates from registration data and the indirect estimates from the census data. The estimates from census data are considerably higher.

The fact that mortality has been declining in the Maldives for the past two decades and that the indications of a sustained fertility decline has become evident in the more recent years, suggest that the actual levels of infant and adult mortality may be lower than what is portrayed by these indirect estimates. Assuming that the quality of age reporting has remained consistent over the period of the two censuses, these estimates provide indicators of the differentials in mortality experiences of various subgroups of the population, the most important of these being the geographic differences in mortality.

The MORTPAK-LITE, a microcomputer software package developed by the United Nations (United Nations, 1990) for the indirect estimation of mortality measures, was used in the computation of infant and adulthood mortality in the Maldives using data from the censuses of 1985 and 1995. The output provides estimates of mortality by the five United Nations Model Life Tables (United Nations, 1982c) using Palloni-Heligman (1985) equations and Coale and Demeny Model Life Tables (Coale and Demeny, 1966) using Trussell (1975) equations. The respective reference dates to each estimate are also provided.

A single estimate of infant mortality was obtained by interpolating between the estimates for the age groups 20-24 and 25-29 (the age groups in which women are least likely to misreport their retrospective fertility), to arrive at estimates for the midpoints of 1982 and 1992 on the basis of the estimates from 1985 and 1995 censuses, respectively (see Table 6-1). While the estimates were slightly different by both models for 1982, the two models provided almost similar levels in 1992. In all atolls and in Male' island, infant mortality declined substantially during the 10 year period. For the country as a whole, IMR declined from 117 per thousand live births in 1982 to 71 per thousand live births in 1992 by the UN South model and from 121 per thousand live births to 72 per thousand live births by the Coale-Demeny West model. In fact all atolls have experienced mortality decline during the 10-year period. Such rapid declines are probably the result of the ambitious primary health care programmes of the government during the past two to three decades (see Chapter 3). These declines in the IMR, together with high, albeit declining fertility, is likely to have major implications on the age structure of the population with large numbers surviving through the school ages and into the adult ages, bringing with it demands for social and economic services which corresponds to the particular stages of their lives.

It can be seen from Table 6-1 that there is wide variation between different atolls in the levels of infant mortality, the gap between the lowest and highest levels have declined between 1982 and 1992. The standard deviation of the levels of IMR in 1982, including Male' island, was 19.4 while in 1992 it was 11.4 (table not shown).

Table 6-1: Infant Mortality Rates (per '000 live births) by Indirect Estimation from CEB and CS data, 1985 and 1995 Censuses*, Maldives

Region	Jun-82		Jun-92	
	UN South Asian Model	Coale-Demeny West Model	UN South Asian Model	Coale-Demeny West Model
Maldives	117	121	71	72
Male' Island	90	92	58	59
North Thiladhummathi	94	97	71	71
South Thiladhummathi	142	149	79	81
North Miladhummadulu	129	137	93	96
South Miladhummadulu	136	142	68	70
North Maalhosmadulu	141	148	71	72
South Maalhosmadulu	92	95	48	48
Faadhippolhu	123	129	58	59
Male' Atholhu	136	144	69	69
North Ari	144	154	85	87
South Ari	120	124	66	67
Felidhu Atholhu	77	73	56	56
Mulakatholhu	122	126	62	62
North Nilandhe	129	130	78	79
South Nilandhe	124	127	83	85
Kolhumadulu	132	134	74	76
Hadhdhummathi	144	150	80	81
North Huvadhu	125	131	78	80
South Huvadhu	130	139	82	84
Foammulaku	104	107	55	52
Addu	100	103	65	66

* UN South Asian model using Palloni-Helligman equations and Coale-Demeny West model using Trussell equations.

Source: Computed by the author from census data

Considering that the assumptions of stable mortality and fertility that lie behind the indirect estimation methods employed here appear to have been violated (as the evidence presented in Chapter 5 and this chapter shows declining fertility and mortality), the exact levels of mortality are likely to be overestimated. This implies that the actual levels of mortality and survival could not be too far removed from the mortality measures indicated by direct methods from registration data.

6.2 Mortality Differentials

6.2.1 Age Differentials

The age distribution of deaths from registration data is used to compute an abridged life table for the Maldives by sex in order to estimate the life table age

distribution of mortality by sex. The age specific death rates and the percentage distribution of deaths within the life table are presented in Table 6-2.

Table 6-2: Age Specific Death Rates* and Percentage Distribution of Deaths by Age, Maldives, 1997**

Age group	ASDR per '000		Percentage deaths	
	Male	Female	Male	Female
0-1	0.027	0.027	2.6	2.6
1-4	0.002	0.002	0.6	0.9
5-9	0.001	0.001	0.4	0.3
10-14	0.001	0.000	0.3	0.1
15-19	0.001	0.000	0.4	0.1
20-24	0.001	0.000	0.3	0.2
25-29	0.001	0.001	0.5	0.5
30-34	0.002	0.002	0.8	0.7
35-39	0.002	0.003	0.8	1.6
40-44	0.005	0.005	2.2	2.1
45-49	0.006	0.003	2.8	1.4
50-54	0.008	0.007	3.6	3.3
55-59	0.017	0.014	6.8	6.0
60-64	0.028	0.032	10.4	11.8
65-69	0.064	0.069	18.8	20.2
70+	0.131	0.167	48.8	48.0
Total	-	-	100.00	100.00

* Registration data from Statistical Yearbook of Maldives, 1997

** from nDx values, Coale-Demeny West model life table, Maldives (computed by the author)

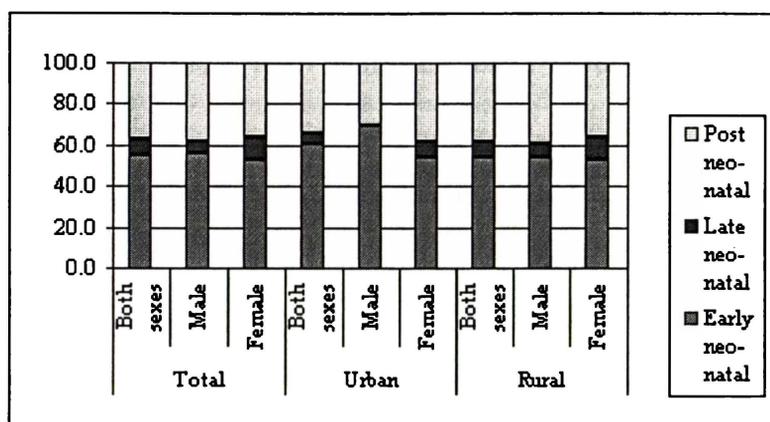
As seen in Table 6-2, except in the age groups above age 45, a high proportion of deaths occur in the first year of life. There after, the proportions of deaths decline rapidly and remains low until about the age 40, when the proportions begin to increase rapidly. This pattern follows the standard mortality curve in developing countries (see Shryock et al, 1976:227).

As shown Figure 6-2, most of these early age deaths are also concentrated in the very initial period immediately following birth. For both the urban and the rural populations and for both sexes, over 50 percent of deaths that occurred during infancy occurred during the first seven days of life (early neo-natal).

The extremely low proportion of deaths in the period from the second week to the fourth week (late neo-natal) suggests that many of the deaths that occurred in the first week after birth occurred immediately following birth, rather than being evenly spread throughout the whole week. The proportion of deaths that

occurred during the period from 28 days to 1 year of life (post neo-natal) was also considerably high, around 30 to 40 percent of all infant deaths, for the urban and rural areas for both sexes. The age pattern of deaths in the younger ages was slightly different for rural females, compared to the rest. In the under-five age group, the highest proportion of deaths for the rural females occurred in the age group 1 to 4 years of age.

Figure 6-2: Infant Mortality by Age of Child, Maldives, 1997



Source: Computed by the author from Statistical Yearbook of Maldives, 1997

Table 6-3: Infant Mortality Rates from Vital Registration Statistics, Classified by Age and Sex of Child, 1986-1996 (Infant deaths per 1000 live births)

Year	Males					Females					
	of death	<1 week	1-4 weeks	<4 weeks	28-365 days	Total IMR	<1 week	1-4 weeks	<4 weeks	28-365 days	Total IMR
1986		23.0	11.4	34.5	31.7	66.2	18.7	7.8	26.5	22.4	48.9
1987		23.8	9.9	33.7	20.3	54.0	16.9	7.7	24.6	20.8	45.4
1988		26.6	7.1	33.7	19.1	52.7	18.8	5.3	24.1	19.8	43.9
1989		18.3	4.7	23.0	22.1	45.1	14.2	5.4	19.6	20.3	39.9
1990		16.2	6.2	22.5	10.7	33.1	14.2	4.1	18.4	15.7	34.0
1991		16.3	7.3	23.6	15.9	39.5	13.8	5.5	19.3	17.3	36.7
1992		16.7	3.8	20.5	13.4	33.9	11.0	3.1	14.1	12.8	26.9
1993		15.5	6.4	21.9	13.5	35.4	15.1	4.9	19.9	12.9	32.9
1994		16.9	3.7	20.6	10.8	31.5	13.6	3.3	16.9	11.1	28.1
1995		21.7	2.9	24.6	7.7	32.3	16.1	4.8	20.9	10.1	31.0
1996		17.6	2.3	19.9	12.4	32.3	11.2	3.6	14.8	9.7	24.5

Source: Computed by the author from Statistical Yearbooks of Maldives, 1997 and 1998.

It can be seen from Table 6-3 that infant mortality at all ages has declined significantly during the period 1986 to 1996. During this period the neo-natal deaths increased slightly as a percentage of all infant deaths, both for males and females alike. In 1986, 52 percent of male infant deaths and 54 of female infant deaths occurred in the neo-natal period, which is the first four weeks of life. This increased to 62 percent of male infant deaths and 60 percent of female infant deaths in 1996. In comparison, the proportion of post neo-natal deaths declined from 48 percent for males and 46 percent for females in 1986 to 38 percent for males and 40 percent for females in 1996. At all ages female infants experienced lower death rates than male infants, throughout the entire period.

Neo-natal deaths are attributable, primarily to endogenous factors and to a lesser extent, to exogenous and environmental factors. Endogenous factors are those factors such as birth injuries and congenital factors, while exogenous factors are those that are caused due to the effects of the environment such as infectious diseases which can be influenced by improvements in sanitation and medical controls (Shryock, et al, 1976: 232). The endogenous factors are relatively less important in the post neo-natal period when exogenous factors dominate. Mortality during the post neo-natal period is more responsive to environmental factors and health care delivery (United Nations, 1976:136).

When infant deaths under one month of age are separated into those deaths that occurred within the first week of life and those that occurred between the first week and one month of life, it can be seen that for both males and females, the proportion of deaths that occurred between the first week and first month of life declined between 1986 and 1996. This decline may also be attributable to improvements in neo-natal health care and socio economic and environmental conditions in the islands of the Maldives.

The proportionate increase in neo-natal deaths is a direct result of decline in the numbers of post neo-natal deaths due to significant improvements achieved in health care delivery and living conditions of the people in the islands of the Maldives in the recent past.

6.2.2 Sex Differentials

Sex differentials in infant mortality (Table 6-3) show that in the Maldives, females currently enjoy lower death rates than males. Indirect estimations of these two indicators (Table 6-4) by sex and urban rural region indicate that these differentials exist in the urban as well as the rural areas. Estimates of infant mortality by sex show that, in 1992, female infants died at an estimated rate of 66 per thousand live births, while for male infants, the corresponding rate was 77 per thousand live births. Among the urban population it was 49 per thousand live births for females and 65 per thousand live births for males. The corresponding figures in the rural areas were 68 and 78, respectively.

In terms of life expectancies at birth, indirect estimates referring to the year 1992 indicate that for the whole country, female life expectancy was about 66 years and for males it was 63 years. The gap appears to be larger among the urban populations. The life expectancy of urban females in 1992 was estimated at 70 years and that for males at 66 years. Rural females too enjoy a higher life expectancy compared to rural males. The figures were 66 and 63 years, respectively (see Table 6-4).

Table 6-4: Infant Mortality and Expectation of Life at Birth for 1992 by Region and Sex, Maldives

Mortality index	Total	Urban	Rural
Infant Mortality*			
Females	66.0	49.0	68.0
Males	77.0	65.0	78.0
Life Expectancy**			
Females	66.0	70.2	65.5
Males	63.4	66.2	63.0

* Infant mortality per thousand live births

** Life expectancy at birth, in years

Source: Computed by the author

In the Maldives, similar to other South Asian nations, female life expectancy was lower than males as recently as during the 1980s. Improvements in the health services provision, especially in the area of obstetrics, and general improvements in the health of mothers are probably the most important factors in the reversal of the sex differentials in life expectancies in the Maldives in the

recent past. Earlier censuses do not provide the data needed for the indirect estimation of mortality by sex. However, published data suggest that life expectancies of females were lower than that of males in the Maldives in the past (National Development Plans, various years).

6.2.3 Regional Differentials

Geographical differentials in mortality are studied through the indirect estimates of infant mortality for the years 1982 and 1992 for the administrative atolls of the Maldives (see Table 6-5). The lowest IMR in 1982 was observed in Felidhu atoll with 77 deaths per thousand live births. In 1992, this atoll had an estimated IMR of 56 per thousand live births. The highest IMR in 1982 was in Hadhdhummathi Atoll and North Ari atoll at 144. In 1992, IMRs in these atolls were 85 and 80, respectively. The lowest IMR in 1992 was observed in South Maalhosmadulu atoll (44) and the highest in North Miladhummadulu (93). The most substantial decline was observed in Faadhippolhu atoll with a decline of 53 percent. The smallest decline was observed in North Thiladhummathi atoll, which was almost 25 percent.

In terms of life expectancies at birth, there were significant variations between the atolls. The lowest life expectancy in 1982 was observed in Hadhdhummathi atoll (48.5) and the highest in Felidhu atoll (63.6). In 1992, the lowest was observed in North Miladhummadulu (59.6) and the highest in South Maalhosmadulu (70.5). The significantly lower levels of mortality in Felidhu atoll can be explained by the small size of the atoll (population, 784 in 1995), proximity to Male' island, and a special programme on family planning conducted in the atoll by a local non-governmental organisation – the Society for Health Education (SHE) (Saleem, 2000, personal communication³⁰).

³⁰ I thank Jeehan Saleem for her permission to quote from personal communication

Table 6-5: Infant Mortality Rate and Expectation of Life at Birth by Region (Palloni-Helligman Method Using South Asian Model Life Tables)

Region	Life Expectancy		Infant Mortality	
	1982	1992	1982	1992
Maldives	54.4	64.8	117	71
Male' Island	60.3	67.9	90	58
North Thiladhummathi	59.4	66.5	94	71
South Thiladhummathi	48.9	62.8	142	79
North Miladhummadulu	51.6	59.6	129	93
South Miladhummadulu	50.1	65.6	136	68
North Maalhosmadulu	49.3	64.9	141	71
South Maalhosmadulu	59.8	70.5	92	48
Faadhippolhu	53.0	67.9	123	58
Male' Atholhu	50.2	65.4	136	69
North Ari	48.6	61.6	144	85
South Ari	53.7	65.9	120	66
Felidhu Atholhu	63.6	68.5	77	56
Mulakatholhu	53.2	67.0	122	62
North Nilandhe	51.9	63.2	129	78
South Nilandhe	52.9	61.9	124	83
Kolhumadulu	51.2	64.0	132	74
Hadhdhummathi	48.5	62.9	144	80
North Huvadhu	52.2	63.1	125	78
South Huvadhu	51.4	62.2	130	82
Foammulaku	57.2	68.8	104	55
Addu	58.0	66.3	100	65

Source: Computed by the author from census data

6.3 Trends and Differentials in Health and Nutrition

The quality of health in a population is dependent on a number of factors such as the quality and quantity of food intake; quality and availability of health care; quality of housing; and other physical and natural environmental factors. Physical well being is an important factor in the longevity of life and productivity of an individual. Above all, adequate health care and nutrition during childhood are important factors in the child's performance in school and later in life (Jones, 1993:26; Cleland and van Ginneken, 1988; Ram and Schultz 1979, cited in Jones, 1993:26).

Earliest available accounts of the dietary patterns of the Maldivian population suggest that the Maldivian diet constituted of a very limited range of foods. Ibn Batuta, a Moroccan traveller, who visited and lived in the Maldives during the early part of the 14th Century, observed that the Maldivian diet consisted primarily of *black bonito* (a variety of fish) (Hakluyt Society, 1994). The other

forms of food consumed by the Maldivians, according to Ibn Batuta were, a form of a small-grained millet and coconuts; 'coconuts were used to make coconut milk, oil, and honey³¹, and honey was used to make sweet dishes'.

The Maldivian diet has probably been always like that, until fairly recently, when imported vegetables and fruits have been added to the diet of the more urbanised populations. In the atolls of the Maldives, even today, very few people have taken the habit of including vegetables and fruits in their daily diet. A survey of island women of the Maldives conducted in 1979 found very little variety in the diet and a strong preference for rice. Small amounts of fish, in one form or another, accompanied the rice. Other foods included boiled starchy vegetables (such as, taro and cassava), but fruit was not a major component of the diet (National Planning Agency, 1980:32). The findings from qualitative inquiries by the author, in three different islands of the Maldives confirm that, even at present, the diet of the rural Maldivians rarely include vegetables or even green leaves, which are grown and abundantly available in most of the rural islands of the Maldives.

The dietary habits of the Maldivians are probably the most important cause for the small stature of the people of Maldives. Dietary inadequacies have been found to contribute to the adult height and age patterns of growth (Falkner and Tanner, 1986, cited from Schultz, 1993: 709). Analysis of historical data on the level and change in the height in Western European populations in recent centuries has shown substantial growth in the stature of men (Tanner, 1981). Changing dietary patterns, especially among the urban population in the Maldives during the past two decades, provide some physical evidence of the effect, as the stature of people in the younger cohorts seems to be improving. However, this observation by the author needs empirical verification.

As a direct result of the dietary inadequacies, even though severe forms of malnutrition are rarely found, under-nutrition is recognised as a public health problem in the Maldives. On the basis of some atoll data on the birth weights

³¹ Ibn Batuta was probably referring to sugar made from toddy.

of children in the Maldives it has been suggested that an average birth weight that is as low as 90 percent of the International Standard for Weight (Harvard 50th percentile) prevailed in the early 1990s. Interestingly, growth faltering begins after the third or the fourth month of life, mainly due to practises in breastfeeding and weaning, resulting in 31 percent of children under three years being stunted with chronic protein energy malnutrition (PEM), seven percent wasted with acute PEM, and three percent both wasted and stunted (Ministry of Health and Welfare: 1995). However, there has been some indication that under nutrition, as measured by two standard deviations below weight for age, has decreased significantly in the Maldives (Department of Public Health, 1994, cited from Ministry of Health, 1997).

Adding to the problem of malnutrition, frequent worm infestations, which remain widespread among the atoll population of the Maldives, is also a recognised public health problem. In some atolls it has been estimated to be as high as 70 to 75 percent although in Male', where the lifestyle and the quality of drinking water are better, the prevalence of worm infestation is less widespread (Ministry of Health and Welfare, 1995).

Collected rainwater and desalination plants together give 100 percent access to safe drinking water to the population of Male'. In the atolls, however, ground water from wells and collected rainwater provides all demand for water for the population. During the dry season many islands run out of the collected rainwater in the collection tanks and they have to rely only on ground water for all their needs. Occasional outbreaks of diarrhoeal epidemics resulting from unsafe drinking water and contaminated food continues to be a public health problem in the Maldives (Ministry of Health and Welfare, 1995).

As can be seen from Table 6-6, the type of drinking water is a major source of disparity in terms of health between the rural areas and the urban population in the Maldives. While most of the atoll populations depend on collected rainwater and ground water for drinking, ground water sources have become polluted due to excessive population growth. This is a situation faced in many small island countries of the world (Campbell, J., 1993; Ahlburg, 1996).

Table 6-6: Percentage Distribution of Households by Source of Drinking Water and Region, Maldives, 1995

Main source of water	Distribution by source		Distribution by region		
	Urban	Rural	Urban	Rural	Total
Rain water	49.4	77.6	8.4	91.6	100.0
Desalinated water	50.4	1.8	80.0	20.0	100.0
Ground water	0.3	20.6	0.2	99.8	100.0
Total	100.0	100.0			

Source: Census 1995

Thanks to the success of the national childhood immunisation programme since the 1970s, diseases such as polio, diphtheria, whooping cough, childhood TB, and neonatal tetanus have ceased to be major public health concerns in the Maldives. However, measles still continues to be a problem with the latest outbreak occurring in 1995, although there were no deaths reported (Ministry of Health, 1997).

Most of the contagious diseases have been controlled in the Maldives. However, new public health concerns are emerging, such as sexually transmitted diseases like HIV/AIDS. Available evidence also suggests that non-communicable hereditary diseases are becoming increasingly serious. The most significant among them is Thalassaemia (Government of Maldives, 1998).

Thalassaemia is a severe anaemia caused by a chronic genetic disorder, which results in a life-threatening reduction of haemoglobin, the vital protein that carries oxygen in the red blood cells. It is transmitted by inter-marriage of carriers of defective genes. Maldives, with an estimated 20 percent of its population being carriers, has one of the highest prevalence rates of Thalassaemia in the world. The implications of an affected birth are slightly different between the urban and the rural areas; for the urban population, the chances of early detection and regular blood transfusions are more easily available, while in the remote rural islands, such cases often die undiagnosed in infancy (Ministry of Health and Welfare, 1995).

Other non-communicable diseases that are of growing concern in the Maldives are heart disease, diabetes and renal diseases. The gains in the reduction of communicable diseases and to some extent, changing lifestyles of the

Maldivian people probably contribute to the emergence of these new concerns in the recent years.

Some socio-cultural factors, such as the high divorce and remarriage rates and the restrictions on the availability of condoms only to the married population, and economic factors, such as the growth of tourism in the Maldives and other factors, makes the population of Maldives susceptible to sexually transmitted diseases (STDs) and HIV. This is especially so when a predominantly young male local labour force working in the resorts are likely to intermingle with the tourist population and in turn with the populations in the inhabited islands (Ministry of Health and Welfare, 1995).

While there exist significant disparities among the urban and the rural populations in the level of development, differences also exist between rural areas. Some islands have moved rapidly forward in terms of socio-economic development. However, others have lagged behind and have not done as well. Some of the latter are barely accessible, surrounded by shallow reefs that prevent accessibility by any reasonable size boat. It is in these islands that food security tends to be more precarious, malnutrition more widespread, and incidences of disease higher (Government of Maldives, 1999).

The other crucial area of public health where large disparities exist between Male' and the atolls is in the area of waste disposal. While a system of sewage as well as solid waste disposal has been set up recently in Male', most rural atolls still lack adequate modes to deal with this issue. However, the types and volume of solid waste generated in Male' and the atolls are also vastly different. Male' being the major population centre and the centre of business, services and industries in the country, and therefore, the lifestyles of the population of Male' bound to be considerably different from the atoll populations, contribute to the volume of waste generated per capita in Male'. It has been estimated that Male' generates around 50 metric tonnes of refuse per day (Government of Maldives, 1999). This converts to roughly over one half a metric tonne of refuse per capita in Male'.

Almost all solid wastes from Male' are transported to a designated landfill site at a neighbouring island. Liquid toxic wastes are disposed of in the sewerage system, which is disposed into the sea in untreated form (Government of Maldives, 1999).

In the atolls, the solid waste generated will be less in per capita volume as well as in the content of toxic and hazardous waste. Disposal of waste generated in the atolls takes the traditional forms such as dumping in unlined pits on the inhabited islands. In some of the more populated islands the undesirable effects of this method of waste disposal, on the health of inhabitants is likely to be high, although no such study has been conducted so far in the Maldives. Incinerators are used in the tourist resorts for the processing of waste generated on those islands (Government of Maldives, 1999).

All these methods of waste disposal bear the risk of pollution in some form or the other. In the case of Male', it is the risk of leaks and spills of toxic and hazardous waste into the sea, and in the atolls it is the risk of pollution and contamination of the freshwater aquifer of the island. The situation confronting the atolls had already been experienced in Male'. The freshwater aquifer of Male' has turned saline and contaminated before the piped sewage system was constructed a little over a decade ago. Apart from the health implications of these factors, they also pose direct threats to the fragile environment of the atolls of the Maldives.

Types of toilet facilities used by the populations of the atolls and Male' provide evidence on the disparities between the two regions. Only 31,000 out of over 34,000 dwelling units provided information on the type of toilet facilities available for household use in the census of 1995.

Table 6-7: Type of Toilet Used by Household Members by Region (percentages by row)

Region	<i>Gifili</i>	Beach	Shared toilet connected to		Private toilet connected to		Not stated
			Main sewer	Septic tank	Main sewer	Septic tank	
North Thiladhummathi	8.2	62.4	0.0	2.5	1.1	22.9	3.0
South Thiladhummathi	14.2	55.1	0.2	3.0	0.9	25.4	1.1
North							
Miladhummadulu	6.7	66.3	2.1	3.8	6.7	14.3	0.2
South							
Miladhummadulu	4.4	56.3	0.3	2.5	0.9	35.2	0.4
North Maalhosmadulu	2.1	60.5	1.1	3.7	12.9	18.5	1.1
South Maalhosmadulu	8.8	45.2	1.6	10.0	12.2	18.6	3.6
Faadhippolhu	7.3	22.1	9.0	4.1	54.1	2.5	0.9
Male' atholhu	4.1	31.3	3.4	7.4	13.7	37.7	2.4
North Ari Atoll	10.0	49.6	2.3	3.5	4.1	28.4	2.1
South Ari Atoll	8.0	52.3	0.1	3.8	0.6	34.6	0.6
Felidhu Atoll	0.4	65.1	8.7	0.9	9.2	14.4	1.3
Mulakatholhu	3.2	57.2	10.9	3.2	12.2	13.2	0.1
North Nilandhe Atoll	2.5	74.2	0.2	4.0	0.2	17.5	1.3
South Nilandhe Atoll	6.2	58.6	0.1	1.8	0.9	31.2	1.2
Kolhumadulu Atoll	7.3	59.7	0.4	6.6	1.1	24.2	0.7
Hadhdhummathi Atoll	6.3	69.0	0.1	2.9	0.3	20.9	0.6
North Huvadhu Atoll	22.2	48.1	0.2	5.2	2.6	20.8	0.8
South Huvadhu Atoll	28.4	35.1	0.3	8.8	1.8	24.5	1.0
Foammulaku	32.0	10.6	0.4	2.9	0.3	53.3	0.5
Addu Atoll	47.6	3.8	0.2	6.5	0.3	40.8	0.9
Male'	0.6	0.1	13.8	1.3	79.1	3.2	1.9
Atolls	14.3	47.0	1.3	4.6	5.8	25.7	1.2
Total	12.5	40.9	2.9	4.2	15.3	22.8	1.3

Note: *Gifili* is the Maldivian name for an enclosed open-air area within the housing compound used as a toilet for members of the household

Source: Census 1995

The most unexpected finding is the high proportion of households in the atolls using the beach as a toilet in spite of the mass education programme that followed the cholera epidemic of 1978 (Ministry of Health, 1995). Over half of the atolls reported at least 50 percent of their households using the beach. The atoll with the highest proportion of households using the beach as a toilet was North Nilandhe atoll (74 percent). Besides Male', the southern most two atolls reported the lowest proportions of their households using the beach as a toilet in 1995. In these atolls the highest proportions of their households used toilets connected to septic tanks as none of the islands in these atolls had a pipeline for all the households. However, in these two atolls, the use of *gifili*

seems to be the second most prevalent mode of sewage disposal. In Male', close to a hundred percent households reported using a toilet connected to the pipeline. The atoll that has the highest proportion of households using toilets connected to septic tanks is the one-island atoll of Foammulaku (53 percent). This is followed by Addu Atoll (41 percent) and Male' atoll (38 percent).

6.4 Summary and Conclusions

Direct and indirect estimates of mortality indicate that mortality has declined significantly during the ten-year period, 1985 to 1995. These declines are not restricted to a particular region or regions of the country. All regions experienced significant declines, but significant variations exist between different regions in terms of the levels of infant mortality and life expectancies at birth.

In the Maldives, like most developing countries, a high proportion of deaths occur in the first year of life. After the first year of life it remains low until the age 40. Most of the infant deaths occur during the early neo-natal period and many of these are likely to occur during the first couple of days after birth. While the overall infant mortality rate has declined significantly during the intercensal period, as expected, female infants experienced lower death rates than male infants did.

The fact that neo-natal deaths are mainly caused by endogenous factors, it is also the age group that is least likely to be influenced by improvements in health service delivery and sanitation. Improvements in antenatal care and obstetric services can help reduce the numbers of early neo-natal deaths. The overall declines in the IMR and its impact on the natural growth rate is likely to have major implications for the age structure of the population both at present and the future resulting in significant effects on the human capital development and management programmes of the country.

Females currently enjoy a higher life expectancy than males. This was not so prior to the early nineties, when, similar to some other societies of South Asia, the life expectancy of males was higher than females. Improvements in the

delivery of health care and the general health of mothers may be the contributing factors.

Dietary habits of the Maldivians, especially the rural populations, have changed little since historical times. Poor nutritional composition of the Maldivian diet is most likely to be the cause of the small stature of the people of the Maldives. Apart from the small stature, under-nutrition is a recognised public health problem in the country. With the availability of imported fruits and vegetables in the urban area, and the growing awareness of the people improvements are occurring in the diet of the urban dwellers. In the longer term, rural populations are expected to follow.

Other factors such as poor sanitation and contaminated drinking water have created major health problems in the past. However, much improvement has taken place in this respect. Again, there are significant urban rural disparities in these aspects. New concerns such as HIV/AIDS, and congenital diseases such as Thalassaemia are emerging public health concerns. The so-called 'lifestyle' diseases such as diabetes, heart disease and renal diseases are also of increasing concern although these are more likely to affect older persons.

The geographic dispersion of the population imposes problems of food security for some pockets of the populations due to difficulties of accessibility to these islands during bad weather. Other health problems associated with the geographical distribution of the population are related to the disposal of sewerage and solid wastes from the inhabited islands. Infiltration of waste into the fresh water aquifer, on which many island dwellers depend on during the dry season for drinking, have been thought to be responsible for frequent worm infestations and malnutrition among children and also cause the spread of water-borne diseases. In spite of public awareness programmes and improved standards of living, the high proportion of households in the atolls using the beach as a toilet is surprisingly high. It is likely that these may be households in islands with generally low levels of socio-economic development.

Differential levels of mortality by regions, and differentials in the types of amenities accessed by households between regions do not necessarily provide an accurate picture of the socio-economic disparities in the country. Each inhabited island being an entity of its own, island level comparisons would reveal a more meaningful picture of similarities and differences. However, the large numbers of inhabited islands make such comparisons beyond the scope of this thesis.

While the narrowing of the rural urban gap in mortality levels has occurred, disparities in the quality of health and nutrition levels are likely to have significant impact on the overall levels of human capital in the Maldives in the near future. Improvements in the health and mortality levels in the recent years would have several human capital implications. The impact on the population age structure at various life stages would have different types of effects. Firstly, the larger numbers of those surviving would initially impact the provision of human capital development through formal schooling and training. Secondly, at a later stage, these numbers would impact the labour market by the increasing numbers in the labour force. For both these stages, as has been discussed, nutrition and health in the childhood years are especially crucial, as under nutrition is known to inhibit cognitive development which would have negative impacts on the development of human capital (learning) and human capital output (labour productivity) (see Jones, 1992; Ram and Shultz, 1979; Gundlach, 1999).

Apart from the levels and trends in fertility and mortality, migration, both internal and international, is the other major factor that influences the population age structure and the supply of human capital. We will examine these in the next chapter.

Chapter 7: Migration and Spatial Distribution

'The movement of population has been and remains an essential component of economic development, social change and political organisation' (Jackson, 1969:1). Although two decades have passed since this observation was made, it has probably never been more applicable than it is at the present time. Migration is the main factor in the growth of urban populations, which has played a key role in economic development, especially in the small island states where diseconomies of scale are a major inhibiting factor (Walsh, 1982; Pool, 1982, 1991a, 1992; Ahlburg, 1996). On the other hand, migration has also created problems of spatial distribution and population imbalances.

Coupled with rapid increases in national population sizes through natural increase, many developing countries are also faced with the problem of heavy rural-urban migration flows as people aspire for better qualities of life through quality education, better health care, and higher economic benefits of employment in the modern sectors of the economy. Most of these facilities in these countries, almost solely (and in many cases inevitably), are centred in or around the urban centres.

Being a highly dispersed, resource constrained nation of islands, all social and economic services in the Maldives have inevitably been located in and around the administrative capital of the country. Fortunately, in the case of the Maldives, socio-economic development stemming from Male' island, the nation's capital and the only urban centre in the Maldives, has been closely related to rural-urban migration. Recent economic developments in the country have been largely supported by the rural-urban migrant flow.

Male' island being the administrative capital of the country and due to its central location, its pre-eminence among all the inhabited islands of the Maldives, have always attracted migrants from the other islands of the country. This flow of migration remained rather stable for centuries, until at least two major incidences caused the population of Male' island to expand at unprecedented rates during a relatively short period during the 1970s. The first

such incidence was the transfer of the entire settlement from the nearby island of Hulhule' to newly reclaimed land in Male' island. This was a step taken by the government to facilitate the expansion of the existing airport on the island of Hulhule' to make way for an international airport, which was essential for the growth of the newly established tourism industry. Almost concurrent to this, the closure of the Royal Air Force base on the island of Gan in Addu atoll created record levels of unemployment in the Maldives, prompting heavy flows of migration from all islands of Addu atoll to Male' island. While the growing tourism industry quickly absorbed most of these migrants, the industry also attracted migrants from other atolls of the country.

Rural to urban migration increased with macro-economic developments that were fuelled by the growing tourism sector. However, the geographical structure of the islands of the Maldives dictated a rural to urban migration of a circular type, largely dominated by working age males.

In spite of the increasing rate of the growth of urban population, almost all inhabited islands experienced increases in their population from one census to the other. Spread of the population in the islands of the Maldives being strictly limited by the limited land area, these population increases caused severe imbalances in the populations of several islands.

This chapter reviews the patterns of rural to urban migration and the spatial distribution of population in the Maldives. Differentials according to socio-economic characteristics of migrants are studied. Both internal migration and flow of trans-border movements, as they relate to the Maldivian situation, are reviewed. The chapter closes with a discussion on the implications of population growth by natural increase and migration on the spatial distribution of the population and for the labour force in the Maldives.

7.1 Internal Migration

In this thesis, the patterns of internal migration are studied by two approaches. The first approach is by identifying migrants according to their lifetime

migrant status and then by identifying migrants according to their movement within a fixed period in the past.

7.1.1 Lifetime Migration Trends and Differentials

According to Shryock et al (1976:375), lifetime migration is migration that has occurred between birth and the time of a census or survey, and a lifetime migrant is one whose current place of residence is different from his place of birth. Moreover, those who have returned to the place of birth before the census would not be counted as lifetime migrants, even if that person has lived in a place different from the place of birth during the intercensal period.

In the case of the Maldives, especially in the recent years, this definition may not be the most appropriate for the study of internal migration, as many women travel to a location different from their usual place of residence for the delivery of a child. The mother will return to her place of usual residence soon after the child is born. This is caused due to the lack of adequate obstetric care in many inhabited islands of the Maldives, prompting pregnant women, especially those identified by the local health worker to be in the high risk category, to travel to the nearest island where a health centre is located. For this reason, in the present context, a lifetime migrant can be more accurately defined as a person who has changed the usual place of residence at least once during the lifetime.

In the recent censuses of the Maldives, if a person lives in a certain place for a period of not less than one year, that place is defined as the person's usual residence. In other words, a lifetime migrant is defined as a person whose age in completed years is greater than the number of years continuously lived in the place of enumeration. This is thus an account of those people who have moved residence at least once in their lifetime, and will be the definition of a lifetime migrant used in this thesis.

This approach will capture those persons who have lived away from their birthplace during the course of their life, but who have since returned to the place of birth where they were enumerated in the census. Such persons would include those who have lived in a place different from their place of birth for a

period of time (in the case of the census, this period was one year) for the purposes of education or employment, or any other reason.

Table 7-1: Life-time Migrants by Locality, Sex and Percentage Change

Sex	Male'			Atolls		
	1985	1995	Change	1985	1995	Change
Male	12902	12942	0.3	15671	16981	8.4
Female	6616	9857	49.0	9287	8923	-3.9
Total	19518	22799	16.8	24958	25904	3.8

Source: 1985 and 1995 Censuses of Population and Housing, Maldives

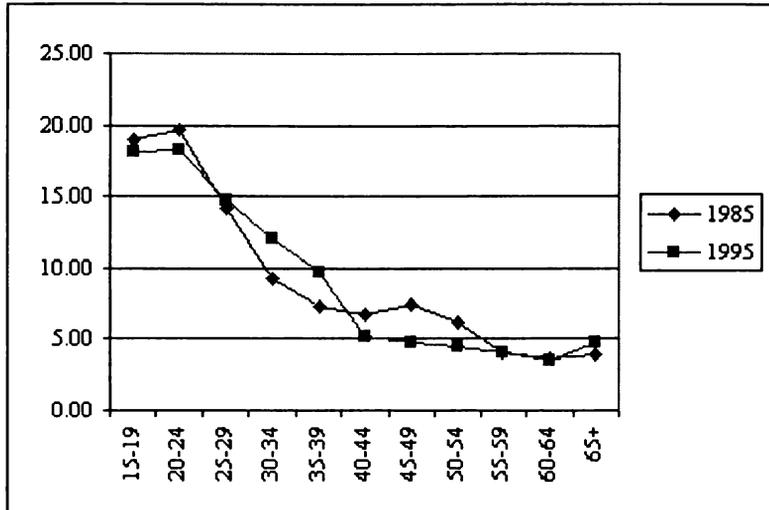
Following the definition of migrants used in this thesis, the number of lifetime migrants enumerated increased by about 17 percent in the urban area and by about 4 percent in the rural areas during the period 1985 to 1995 (see Table 7-1). While the increase in male lifetime migrants in the urban area was only minimal during this period, the increase in female lifetime migrants was of a very high magnitude – almost 50 percent. Consequently, in the rural areas the number of female lifetime migrants declined by about 4 percent. The increase in the number of male lifetime migrants in the rural areas was 8 percent. These figures suggest that males have mostly dominated migration between rural and urban areas and that females have more recently begun to join in this flow of migrants from rural to urban areas.

An age breakdown of lifetime migrants indicates that the age pattern of lifetime migrants have changed in the Maldives during the recent years. The shift has been from the age groups under 25 and the older ages towards the age groups between 30 and 40 years. An increase in the mobility of the population in general is a likely cause for the observed trends (Figure 7-1).

In 1985, among all male lifetime migrants 15 years of age and over in the urban area, 22 percent were in the age group 15-19. The corresponding figure for females was 25 percent. In comparison, in 1995 while as a proportion the males in this category increased slightly to 24 percent, the proportion for females also declined slightly to 24 percent. In the next age group, 20-24, while the proportions for males remained unchanged at about 19 percent, the proportion for females declined slightly from 20 to 18 percent (see Figure 7-2).

Noticeable increases also occurred in the proportions of lifetime migrants in the urban area in the age groups 30 to 40 for both males and females during the 10-year period.

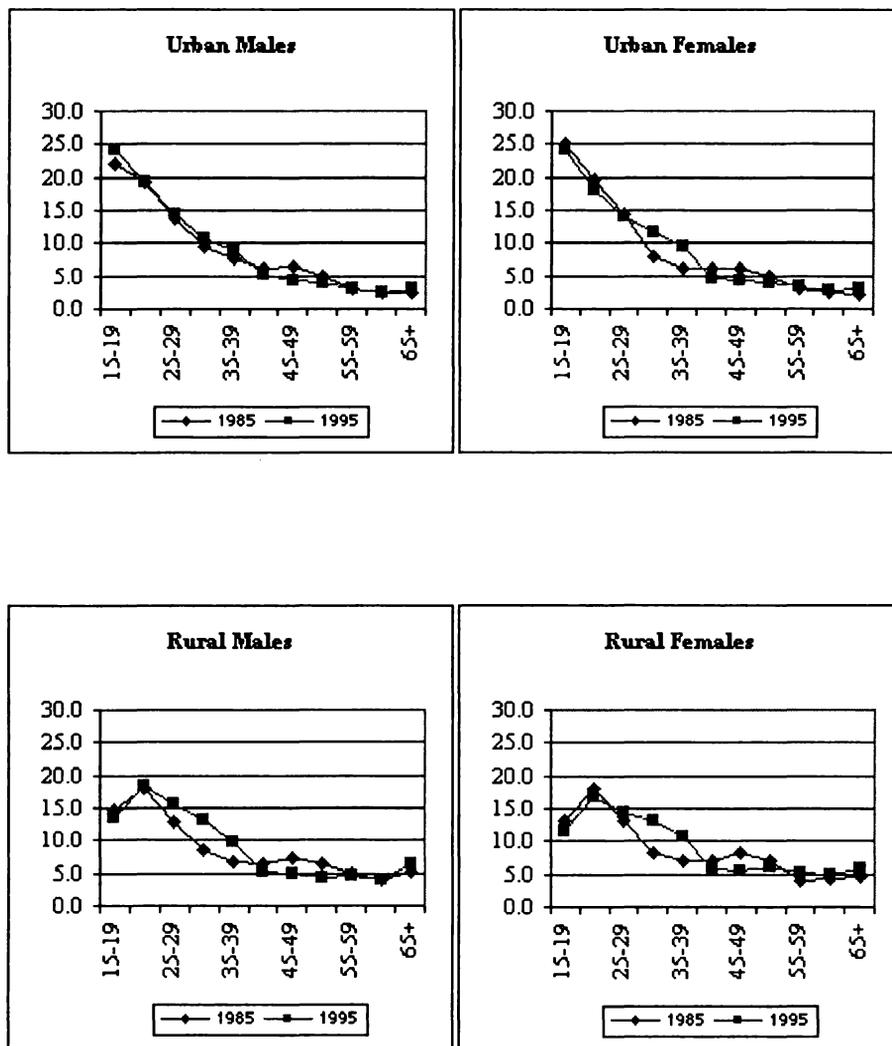
Figure 7-1: Percentage Distribution of Lifetime Migrants by Age Group, Maldives, 1985 and 1995 Censuses



Source: Computed by the author from census data

These changes indicate that while a high proportion of lifetime migrants are probably those who move in search of educational opportunities, there has been an increase in the mobility of females in the working ages too. However, observation of changes in the age distribution of lifetime migrants in the rural areas suggest that females are more likely to return to the rural areas after completion of schooling while males are more likely to remain in the urban area. Considering the restrictions for females in engaging in employment away from the home islands (see Chapter 10) this observation provides some indication of the existence of such a social bias. Given this situation, it is interesting to see that there has been an increase in the proportions of female lifetime migrants in the working ages in the urban area.

Figure 7-2: Lifetime Migrants by Region of Enumeration and Sex, Maldives, 1985 and 1995



Source: Censuses of 1985 and 1995

7.1.1.1 Reasons for Migration

For those who were categorised as lifetime migrants, as defined in this thesis, information was collected in the census on the reasons for migration. The reasons were classified as employment, business, education, due to family migration, marriage, medical reasons, and others. The analysis of lifetime migration will be made on the basis of the population six years of age and over. The reason for using this unconventional age grouping is that with the introduction of modern schooling in the rural islands of the Maldives, it is

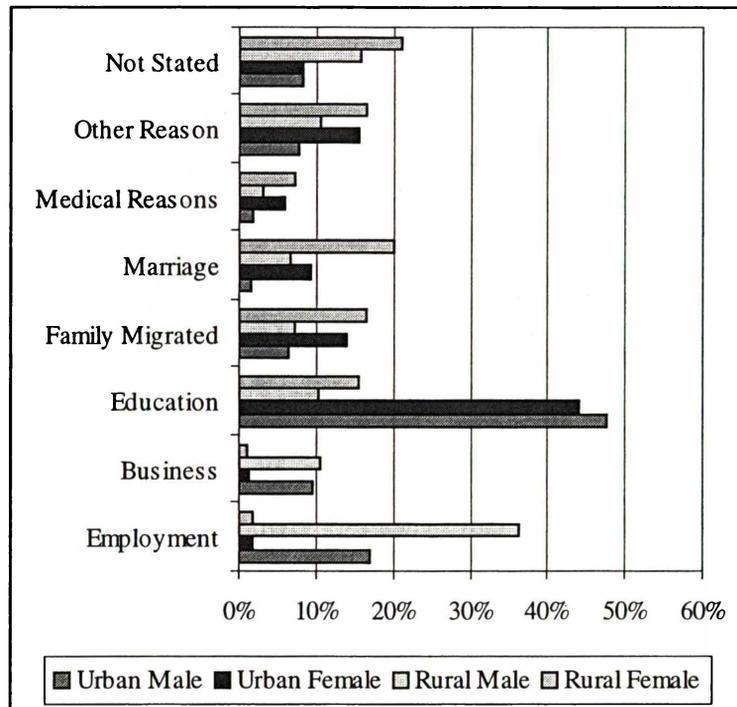
becoming more and more acceptable for parents to send their children to a neighbouring island that has a better school than the one available locally in order to provide them with an education. Inclusion of those aged six years and over would reveal the extent of educational migrants, while minimising the effect of pre-school age children accompanying parents, who migrate for several reasons.

As expected, the most common reason for migration for those lifetime migrants living in the urban area was education. This was true for both males and females, although a slightly higher proportion of the male migrants in the urban area reported this reason, in comparison to the proportion of the female migrants. For rural and urban males employment was given as another major factor in lifetime migration. Employment was stated as the most important reason for migration for males enumerated in rural areas; they are most likely to be return or circular migrants who work in the urban area. However, for both urban and rural females the proportion that stated employment as a reason for migration was almost negligible. The same was true for those who stated business as the reason for migration. Other important factors in the migration of rural males were business, education, and to a lesser extent, family migration and marriage (see Figure 7-3).

Education, family migration and more importantly, marriage as reasons for migration appear to be important for rural females. While education and family migration are likely to be stated by those who have returned from the urban area either having attended school or having their children sent to school in the urban area. However, those who stated marriage as a reason for migration are more likely to be inter-atoll or inter-island movements³².

³² The author observes that intermarriage is commonly practised between the different islands of the Maldives and often between islands in different atolls.

Figure 7-3: Percentage Distribution of Lifetime Migrants by Reason for Migration, Region and Sex, Maldives, 1995



Source: Computed by the author

The age distributions of lifetime migrants by reason for migration are shown in the graphs in Figure 7-4: Percentage Distribution of Lifetime Migrants by Reason for Migration, Age Group and Sex, Maldives (urban and rural), 1995

. Some interesting observations can be made from these graphs. For those whose reason for migration was education, it seems that highest proportions of females in the urban area are slightly older than the highest proportions of males in the urban area. This lag in the peak age group suggests the effects of the spread of secondary level education in the rural areas in the recent years. When educational opportunities are available in the rural areas, females are probably less likely to be sent to the urban schools for more quality education. While there appears to be no discrimination between male children and female children in schooling, it seems that the reluctance of parents to send their daughters away from the home island may be having an effect on the quality of schooling between male children and female children in the rural areas.

The other interesting pattern exists among those whose main reason for migration was marriage. While it has been seen that marriage is an important

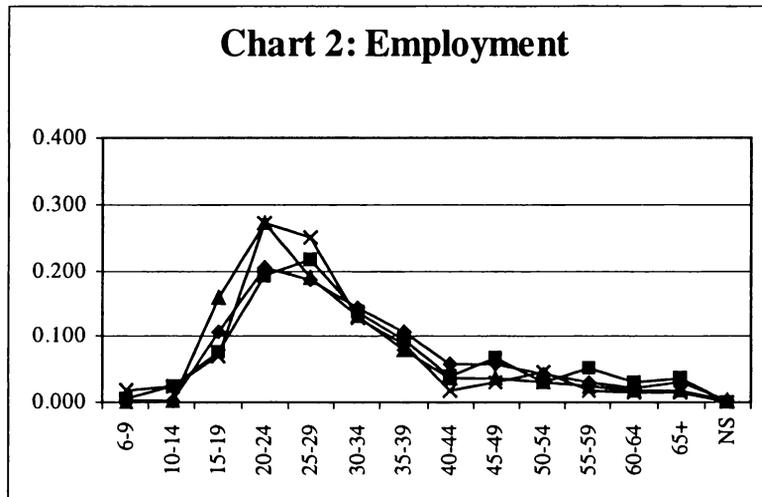
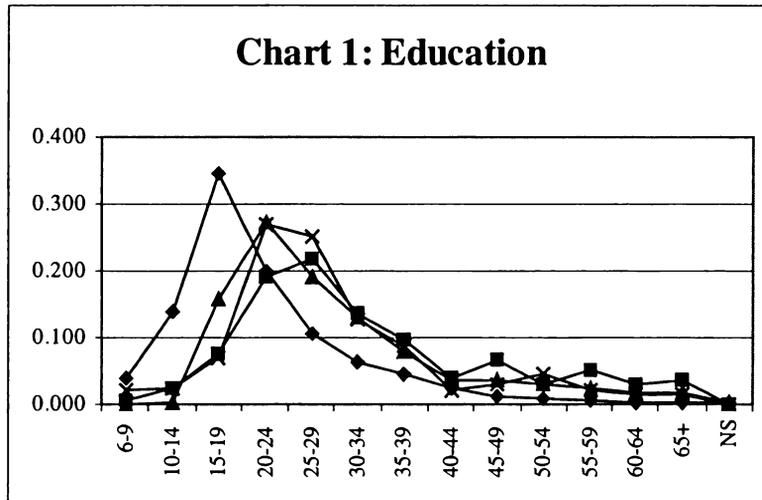
reason for the migration of females, both in the rural and the urban areas, it appears that they are not necessarily young girls, suggesting that it is not a recent phenomenon but one that existed in the past too. These patterns also suggest that it is more likely for females to migrate to the island of the husband after marriage, than the reverse.

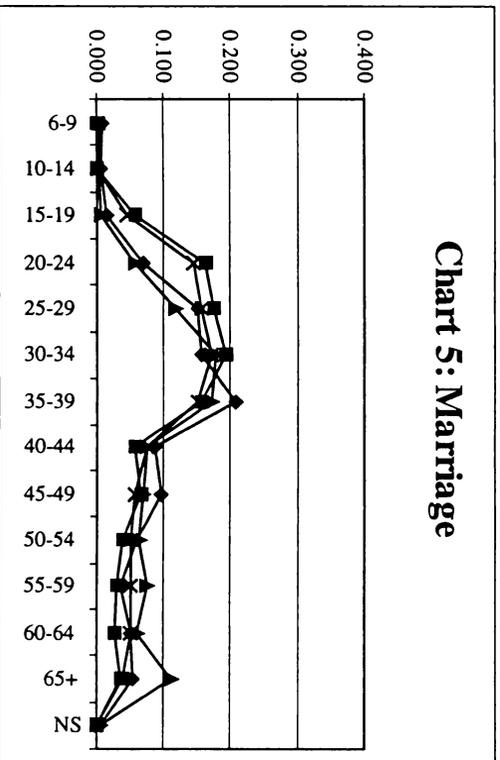
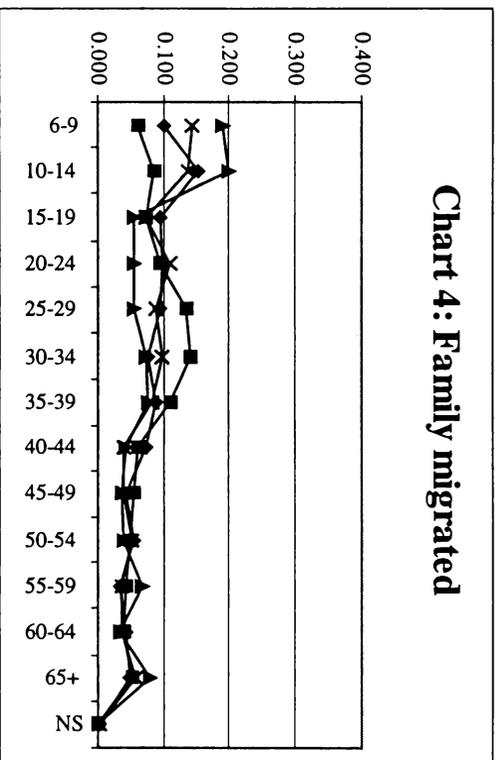
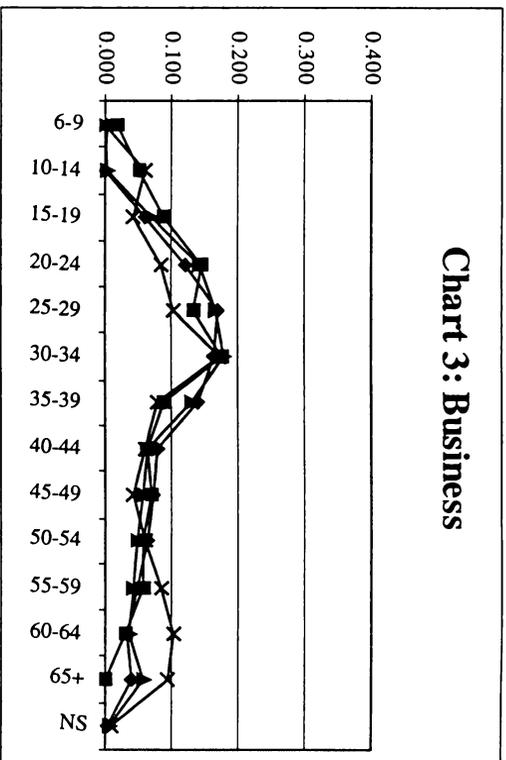
The age distribution of those whose reason for migration was reported as 'family migration', suggests that a high proportion of migrant families with young children are found in the rural areas. Curiously, the proportion of young children appears to be quite low in the urban area. The former are likely to be either families that return migrated from the urban to the rural areas or those who have moved from one island to the other. Of these two possibilities, the latter is more likely because of the government sponsored relocation programmes in the rural areas (see section 7.3.2).

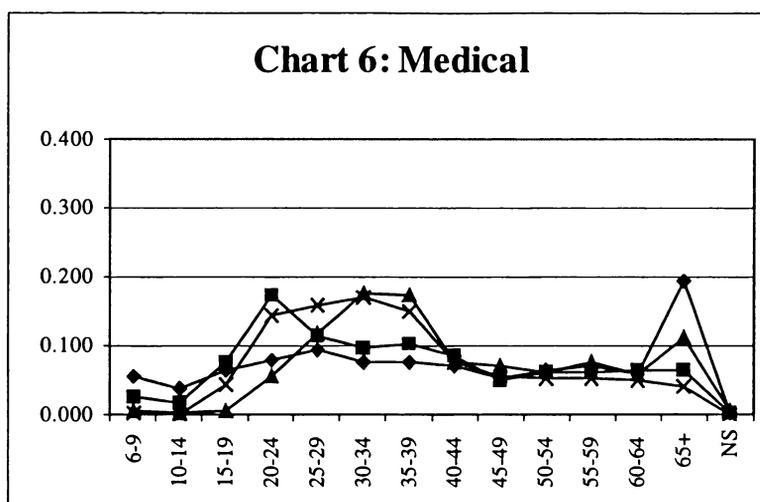
The age composition of the rest of the migrants appears to follow the expected patterns. Most of the employment migrants and business migrants appear to be more or less concentrated in the young adult ages. However, it is probably the effect of females travelling for obstetric care that is seen in the high proportions of female lifetime migrants in the urban area in the early child bearing ages.

Figure 7-4: Percentage Distribution of Lifetime Migrants by Reason for Migration, Age Group and Sex, Maldives (urban and rural), 1995

Key to Charts: ◆ Urban males ■ urban females ▲ rural males ✕ rural females







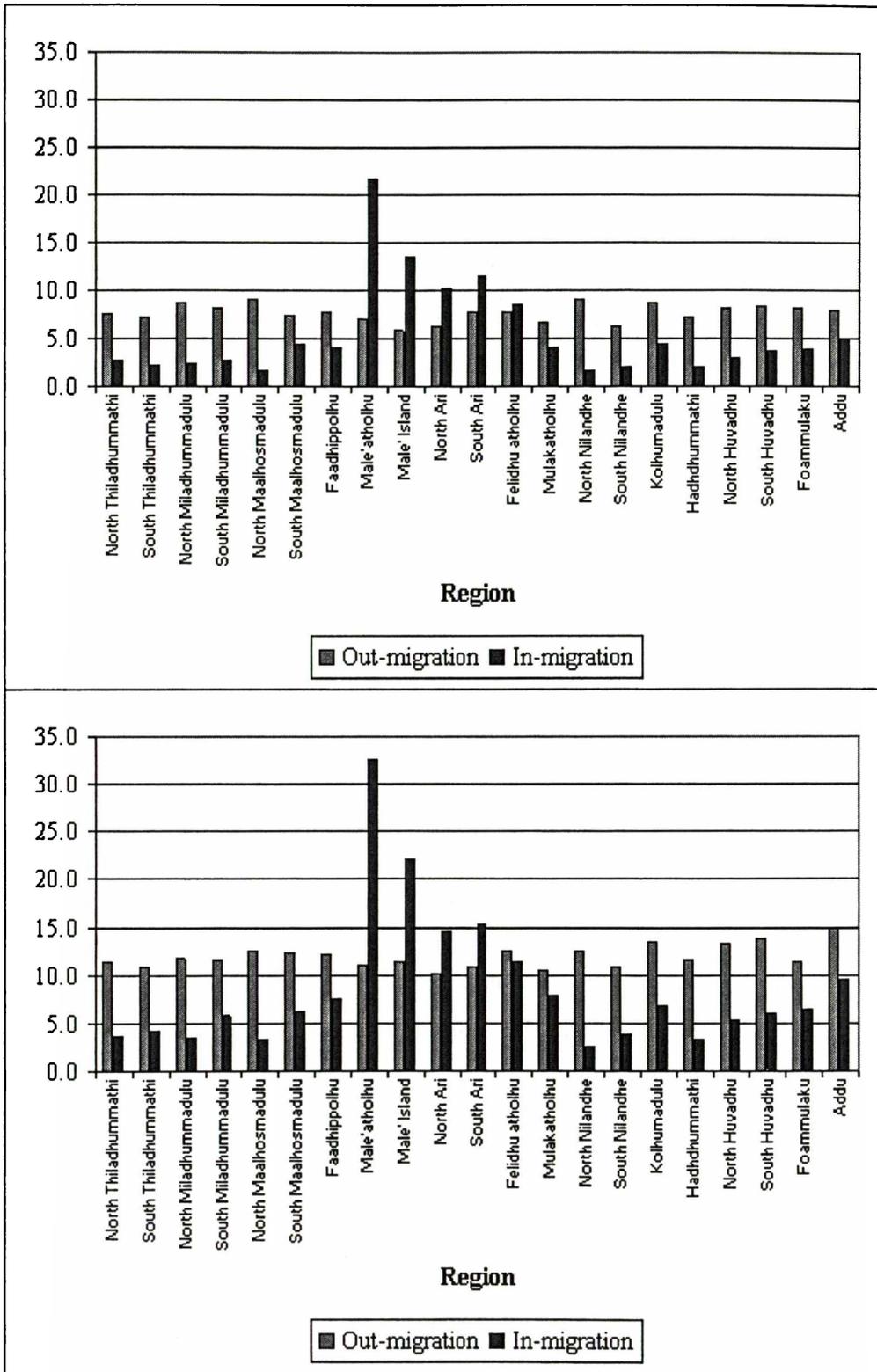
7.1.2 Fixed-Period Migration: Trends and Differentials

As it is common practise in almost all modern censuses, the censuses of Maldives have been collecting information on the usual residence of persons for fixed periods in the past. This information is based on two questions relating to the person's residence at a given reference date exactly one year before the census and exactly five years before the census. Estimation of migration based on such questions has been recognised as one of the most effective approaches (Shryock et al, 1976:391) for the study of short-term migration.

The Census of 1995 collected data on the fixed-period mobility of the population by asking information on the place of residence one year and five years before the census date. This information, cross-classified by the place of enumeration in the census, provides insights on the internal mobility of the population. Using this information, those whose place of enumeration differ from their place of residence one year and five years before the census are considered to be migrants during the given period.

Out-migrants are those who were reported to be resident in a given region at the given reference date, but enumerated elsewhere. On the other hand, in-migrants are those persons that were enumerated in a given region but reported to have resided elsewhere, one year before and five years before the date of

Figure 7-5: Migration Rate (in and out) During the Year Preceding the Census (top chart) and Five Years Preceding the Census (bottom chart), Administrative Regions, Maldives, 1995 Census.



enumeration. In-migrants and out-migrants, expressed as a percentage of the total population in the enumerated area are shown in Figure 7-5.

As can be seen from Figure 7-5, the percentage of out migrants during the two specified reference periods indicate a high degree of internal mobility between the different regions of the country, including those in the tourism zone and from Male' island itself. As expected, these figures also indicate that Male' island and the atolls in the tourism zone are undoubtedly the major receiving areas for internal migrants in the Maldives. Most tourist resorts being located within Male' atoll, this atoll is by far the most important receiving region.

It is interesting to note that the percentages of migrants by regions change when the shorter reference period is taken. In the longer reference period it can be clearly seen that the southern atolls, especially Addu atoll experienced the highest rates of out-migration. However, with the shorter reference period, while the southern atolls still experienced high rates of out-migration, other atolls such as North Maalhosmadulu atoll, North Nilandhe atoll and Kolhumadulu atolls also appear to have experienced significant out-migration rates.

Among the regions outside the tourism zone atolls, and Male' island, Addu atoll stands out in terms of the percentage of in-migrants among its population. This is true for both reference periods. The reason for the high percentages of in-migrants in Addu atoll may be explained by the earlier observation that, due to improved conditions in that atoll, some of those families residing in the urban area may be returning back to the atoll. As may be true for most atolls of the Maldives, part of this flow into the atolls may also be circular migrants returning to their families in the atolls after having worked for some time in Male' island or the surrounding tourism zone, or having attended schools in the urban area.

7.2 International Migration

7.2.1 Out-Migration

Unlike the small island developing nations of Oceania that experience large flows of international migration to the more developed nations of the Pacific Rim (Sudo and Yoshida eds., 1997), international migration of Maldivians for employment in other countries has not reached significant levels. Having said

that, it is also true that today's Maldivians travel more frequently to countries far and near for the purposes of business, education, medical care and pleasure. The only form of overseas employment that brings in remittances to the country in a significant way is; by working onboard local and foreign-owned shipping lines. The remittances brought into the country by these seamen is recognised as a significant source of income for their families, especially in the rural atolls (Haveeru News Service, 1997; Haveeru Daily Online, 2000). Savings from incomes earned by working as seamen are generally invested in the construction of good quality housing or to start up a family business, or for the construction of a fishing vessel. While some of these seamen retire from that occupation after having saved up enough money to invest in a business, others continue to rely on income earned from this occupation to support their families for most of their working life.

7.2.2 Resident Expatriates

In terms of its impact on the national economy due to its foreign exchange implications, the rapid growth in expatriate employment in the country in the recent years is the more significant form of international migration experienced by the Maldives. Expatriate workers or guest workers are employed in various forms of economic activities in the country.

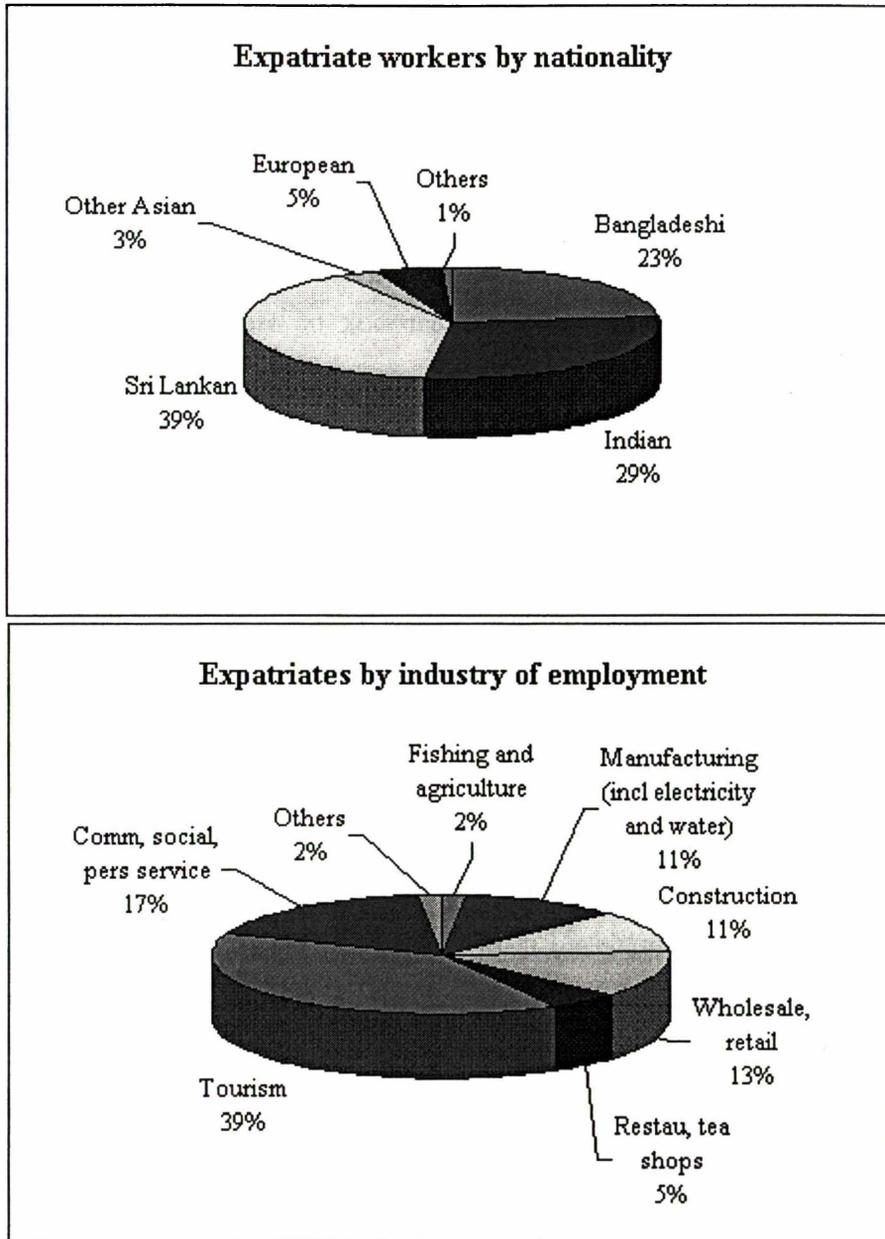
With the introduction of English medium schooling in the country during the early 1960s, the early expatriates in the Maldives were employed as nursery, primary and secondary level teachers in the government schools in Male' island (Ministry of Education, 1995). This was probably the first major flow of expatriate employment into the Maldives. These expatriates were mostly teaching professionals from Sri Lanka. It was not until the introduction of tourism that expatriate employment began to grow and spread into other areas of employment. Apart from the professionals that were being employed directly in resort employment, the socio-economic changes that were occurring in the country opened up employment opportunities for both skilled and unskilled workers in other sectors of the economy, and the social sectors such as education and health.

Since the introduction of tourism in the country in 1972, the socio-economic conditions of the Maldivian people have changed rapidly. At roughly the same time as the growth of tourism, the traditional sail powered fishing fleet went through a revolutionary process of mechanisation, affecting the entire fishing fleet that greatly enhanced the ability of rural fisherman to improve their fish catch (World Bank, 1980). This resulted in increased earnings and thus higher disposable incomes of the average Maldivian families, especially in the urban area.

The next decade saw the expansion of primary schooling to the outer atolls of the Maldives and with this change the attitudes of the rural folk towards sending their young children to Male' island for education also changed. As discussed earlier in this chapter, the result was that the school age children from the rural areas, on whom many urban households relied for household help, became more content with staying in their own islands, and the need to go to Male' island for their schooling became less and less. Urban households that were dependent on such household help looked for alternative sources of labour and began recruiting Sri Lankan women as paid help in the urban households. This rapidly spread to other areas of the labour market.

Data on expatriate labour in the Maldives are only available from 1990 onwards (Statistical Yearbook of Maldives, various years). According to this data, by 1990 there were 8,689 expatriate workers in the country. Within the next 5 years this number grew by over 100 percent. In 1995 the number of expatriate workers in the country was 18,510. While this figure gives the number of legal migrants, the actual number may be more including over-stayers on their work permits and those who overstay their initial three-month tourist visa, which every foreigner entering the country is entitled to.

Figure 7-6: Expatriate Workers by Nationality and Industry of Employment, Maldives, 1997



Source: Computed by the author from Statistical Yearbook of Maldives 1998

The estimated number of expatriate workers in the country in 1999 was over 26,000 and the conservative estimates³³ made by the Maldives Monetary Authority (MMA), the central bank of the country, indicates that an estimated 43.2 million U.S. dollars were paid to them as wages in the same year (Haveeru News Service, 2000). With a Gross Domestic Product of 342.1 million US dollars in 1997 (Statistical Yearbook of Maldives, 1998) and assuming that the annual growth rate of 12.8 percent (Statistical Yearbook of Maldives, 1998) would prevail in 1999, this amounts to roughly 11 percent of the GDP in 1999. The tourism sector contribution to the GDP in 1997 was estimated to be 19 percent (Statistical Yearbook of Maldives, 1998). This shows the impact of having a high proportion of the workforce filled by expatriate workers for the local economy.

As shown in Figure 7-7, the major share of these migrants comes from the neighbouring countries - Sri Lanka, India and Bangladesh. Probably due to the establishment of the initial links through the teachers, or due to the close links that Maldives has had with Sri Lanka since historical times (see for example, World Bank, 1980; Heyerdahl, 1986), Sri Lankans continue to be the largest group (39 percent) of expatriate workers in the country.

As shown in Table 7-2, irrespective of nationality of the expatriate workers, the major share of them are employed in the tourism industry³⁴. However, it can be seen that, close to 85 percent of expatriate Europeans in the Maldives are

³³ In preparing this estimate the MMA assumed an average monthly wage of 139 US dollars. In many of the high skilled occupations such as teachers, doctors, accountants, and resort workers, the actual remunerations are likely to be much higher.

³⁴ Tourism sector includes direct employment in the tourist hotels and resorts and other tourist accommodation. Those who work in air and sea transport companies that are directly linked to tourism are classified under the transport sector. Employment in the community, social and personal services sector includes a variety of activities including labourers in private households and the civil service, those employed as overseas volunteers in the public sector, and all other occupational categories in the public sector. They also include those working in the private sector as barbers, hairdressers, tailors, and other similar occupations. At the higher skill levels, this category includes teachers, vocational instructors, doctors, nurses and other occupations in service-oriented establishments. The classifications of occupations and industries are based on the International Standard Classification of Occupations (ISCO-88): (International Labour Office, 1988) and International Standard Industrial Classification (ISIC-90): (United Nations, 1990).

employed in the tourism industry. Although there are no data available on the types of occupations by nationality, it is well known in the Maldives that most European expatriates are employed in highly skilled occupations that are also some of the more handsomely paid jobs in the tourism industry. Some of them also own a full management contract of the resort or hold joint partnerships with Maldivian investors in the investment and the management of the resort (Ministry of Tourism, 1998).

Table 7-2: Percentage Distribution of Expatriates Employed in Industrial Categories by Nationality, Maldives, 1997

Nationality	Industry of employment											
	Agric	Fishing	Manufacturing	Electricity, gas, water	Construction	Wholesale, retail	Restaurants, tea shops	Tourism	Trans, storage, communications	Financing, insurance	Community, social, personal service	Total
Bangladesh	0.1	0.4	3.2	0.0	6.7	11.3	4.3	57.3	0.2	0.1	16.4	100.0
India	1.0	0.2	8.8	0.1	18.3	17.2	8.8	23.9	0.6	0.1	20.9	100.0
Philippines	0.0	3.8	0.0	1.0	4.8	3.8	1.0	56.7	23.1	1.0	4.8	100.0
Sri Lanka	0.5	2.7	19.9	0.1	10.0	11.9	3.3	33.3	1.4	0.2	16.7	100.0
Other Asian	0.5	1.3	4.5	0.0	9.3	5.6	9.0	44.4	5.3	0.5	19.6	100.0
European	0.0	0.0	0.3	0.1	0.6	3.7	0.6	84.6	5.1	0.1	4.9	100.0
Other nationalities	0.0	0.0	0.0	0.0	2.4	3.2	0.0	33.6	40.8	0.8	19.2	100.0

Source: Computed by the author from the Statistical Yearbook of Maldives 1998

As a percentage of all expatriates employed in the tourism industry, however, Europeans comprise only 11 percent, while Sri Lankan and Bangladeshi workers comprise over 33 percent each. It is the observation of the present writer that, while Sri Lankan workers are more likely to be employed in skilled occupations such as accountants, receptionists, and in restaurant jobs, Bangladeshis are more likely to be employed as unskilled labourers in the areas of construction and maintenance of the resorts.

The three nationalities that together comprise over 80 percent of the expatriate workforce in the country, namely, Sri Lankan, Indian, and Bangladeshi, are mainly distributed over three main industrial categories – construction, trade, and services sectors. The only exception to this is the large proportion of Sri Lankan workers employed in the manufacturing industry (20 percent of all Sri

Lankans), (Table 7-3). Considering that the types of manufacturing industries that would employ expatriate labour is extremely limited, it is almost certain that the majority of these Sri Lankan workers are factory workers employed in the garments factories that are being set up in some islands of the country and also in the fish canning plant operated by the government.

Table 7-3: Percentage Distribution of Expatriate Employed into Different Nationalities by Industrial Category, Maldives, 1997

Nationality	Industry of employment										
	Agriculture	Fishing	Manufacturing	Electricity, gas, water	Construction	Wholesale, retail	Restaurants, tea shops	Tourism	Trans, storage, communications	Financing, insurance	Community, social, personal service
Bangladesh	3.5	7.5	6.5	0.0	14.0	20.6	19.5	33.9	3.7	16.7	22.0
India	57.6	5.1	23.0	35.7	48.4	40.0	50.7	18.0	13.7	20.0	35.7
Philippines	0.0	1.9	0.0	7.1	0.3	0.2	0.1	0.9	11.0	3.3	0.2
Sri Lanka	36.5	83.2	69.4	50.0	35.2	36.7	25.1	33.3	42.5	50.0	38.0
Other Asian	2.4	2.3	0.9	0.0	1.9	1.0	4.0	2.6	9.1	6.7	2.6
European	0.0	0.0	0.2	7.1	0.3	1.5	0.6	11.3	20.1	3.3	1.5
Other nationalities	0.0	0.0	0.0	0.0	0.2	0.2	0.0	0.6	23.3	3.3	0.8
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Computed by the author from Statistical Yearbook of Maldives 1998

Table 7-4 shows the percentage distribution of expatriate workers by occupational category for the different industrial categories. For almost all industrial categories a large proportion of expatriates are employed in elementary occupations. A significant proportion of those employed in the agricultural sector, which employs a very small proportion of all expatriate workers in the Maldives are skilled workers (25 percent).

Those expatriates employed in the fishing industry are most likely to be factory workers in the fish canning plant. The high proportion of expatriate workers employed in the manufacturing industry as plant and machine operators once again suggest that they are most likely to be employed in the garments production factories and the fish canning plant.

It can be seen from Table 7-4 that high proportions of skilled workers are employed in the distribution, transport and communication, financial, and

services sectors. A high proportion of professionals employed in the services sector are most likely to be teachers and instructors in the education and training institutions in the country.

Table 7-4: Percentage Distribution of Expatriates by Industry and Occupation, Maldives, 1997

Occupation	Industry of employment										
	Agriculture	Fishing	Manufacturing	Electricity, gas, water	Construction	Wholesale, retail	Restaurants, tea shops	Tourism	Trans, storage, communications	Financing, insurance	Community, social, personal services
Legislators, Senior Officials and Managers	3.5	0.0	1.8	0.0	0.6	3.8	2.5	7.2	10.4	19.4	0.6
Professionals	3.5	4.7	0.3	28.6	2.9	7.7	0.9	5.1	7.0	16.1	32.3
Technicians and Associate Professionals	0.0	1.9	1.9	0.0	0.6	2.1	1.1	8.5	38.5	16.1	8.5
Clerical and Related Workers	1.2	0.5	0.3	0.0	0.4	0.9	0.6	2.1	1.1	22.6	0.1
Service Workers Skilled	7.1	1.9	1.8	0.0	1.2	14.9	62.4	13.5	3.7	6.5	3.7
Agricultural and Fisheries Workers	24.7	0.0	0.0	0.0	0.1	0.0	0.1	0.7	0.0	0.0	0.2
Craft and Related Workers	9.4	3.3	14.5	28.6	40.5	18.8	1.4	10.9	9.6	3.2	2.0
Plant, Machine Operators, Assemblers	2.4	0.9	57.5	7.1	2.1	4.4	0.4	0.4	7.0	0.0	2.2
Elementary Occupations	48.2	86.9	22.0	35.7	51.6	47.5	30.6	51.7	22.6	16.1	50.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Source: Computed by the author from Statistical Yearbook of Maldives 1998

It would have been interesting from the perspective of human capital if in addition to the above analysis, gender disaggregated data by geographical regions of the country could be analysed. However, such data was not available for the present analysis.

7.2.3 Tourist Flow

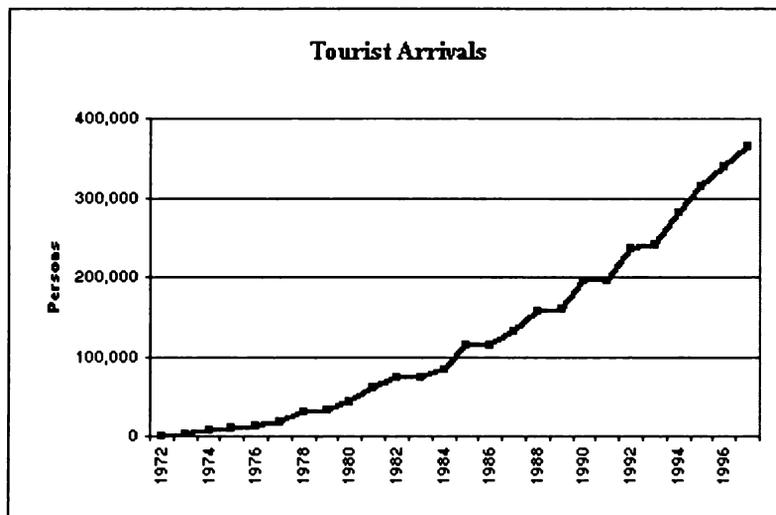
The Maldivian tourism industry made its debut with the arrival of the first tourist group of 22 Italians on 16 February 1972. There were no tourist resorts at that time, and they stayed in Male' island in hastily converted guesthouses. This pioneering group of visitors spent 12 days in the Maldives. They travelled

daily to nearby uninhabited islands, enjoying the untouched beauty of the coral islands and the underwater recreation (Ministry of Tourism, 1998). This was the most significant turning point in the socio-economic development of the Maldives.

In October 1972, the first tourist resort in the Maldives was officially opened with 60 beds. That year saw the arrival of tourists from Italy, Sweden and Germany. Since this initial introduction to the Maldives, Italy and Germany still remain the two major markets for tourism in the Maldives. From the very first introduction, till today, the tourism industry in the Maldives is largely owned and operated by Maldivian entrepreneurs.

By 1977, five years after the initial introduction, there were 11 island resorts with a total bed capacity of 1,034 in operation. Ten years on, in 1982, there were 44 island resorts in the country, with a total bed capacity of 3,984. The number of tourist resorts totalled 70 by 1992 and the bed capacity more than doubled its number in 1982, to a total of 8,487. By 1997 there were 11,962 beds in 74 island resorts in the country.

Figure 7-7: Tourist Arrivals, 1972 to 1997



Source: Ministry of Tourism, 1998

During the 25 years since the introduction of tourism in the Maldives rapid growth in the bed capacity meant that the tourist arrival figures also increased.

There were 74,411 visitors in 1982 was. This is a growth of almost 300 percent from the 1977 arrivals. During the next five years the annual arrivals increased by 77 percent to 131400. In 1992 the number of tourist arrivals were 235,852, an increase of almost 80 percent compared to 1987 (Figure 7-7).

As the country marked the Silver Jubilee of tourism in the Maldives in 1997, the number of tourist arrivals reached 365,563. This was a slightly higher figure than the goal set by the government for that year, which was 350,000. By the end of 1998, the total number of tourist arrivals for that year was 395,725. For the tourism industry in the Maldives, this was an achievement, especially because it occurred in spite of the economic slow-down in East Asia and the resulting drop in arrivals from the markets in that region.

Table 7-5: Registered Bed Capacity, Maldives, 1993-1998

Year	Number of registered beds in				
	Island resorts	Hotels	Guest houses	Registered vessels	Total
1993	9061	158	467	665	10351
1994	10160	216	472	790	11638
1995	10688	312	400	912	12312
1996	11472	312	409	1278	13471
1997	11962	276	407	1484	14129
1998	n.a.	n.a.	n.a.	n.a.	14136

Source: Statistical Yearbook of Maldives, 1998; Ministry of Tourism, 1999

n.a. Data not available

Although most tourist accommodation is restricted to the tourist resorts, floating accommodation, mainly catering to the growing demand from diving enthusiasts is fast growing in popularity. It can be seen from Table 7-5 that bed capacity on board registered tourist vessels increased by over 120 percent between 1993 and 1998. Hotels and guesthouses are all located in Male' island and mostly cater for business travellers from the neighbouring countries and also serve as over-night transfer points between the international airport and the more distant resorts.

The growth of tourism and the resulting increase in tourist arrivals over the years at a very rapid rate has meant that the annual number of visitors to the country has far exceeded its total population. The ratio of tourist arrivals to the local population has been increasing. As seen in Table 7-6, in 1998 there were close to 1.5 visitors to every Maldivian national. The ratio of Maldivian nationals to expatriates, however, has fluctuated at fewer than 10 percent.

Table 7-6: Ratio of Expatriate Workers and Tourist Arrivals to the Local Population

Year	Expatriates/ Tourist	Expatriates/ Local	Tourists/ Local
1995	0.059	0.075	1.277
1996	0.062	0.084	1.340
1997	0.046	0.064	1.405
1998	n.a.	n.a.	1.471

Source: Calculated from data on expatriates and tourist arrivals from Statistical Yearbook of Maldives, 1998; Ministry of Tourism, 1999; and population projections prepared by the author for this thesis.

Perhaps the most important characteristic of the tourism industry in the Maldives (as mentioned in Chapter 2) has been the location of tourism virtually segregated from the local population settlements. The extent of such segregation was noted by Domroes (1993) when he states that, 'Maldivian tourist resorts are in effect 'tourist enclaves' that are distinctly separate from the islands inhabited by Maldivians and that intercultural communication does not take place'.

Initially, when tourism was first introduced in the Maldives, little or no control was made as to where tourists can travel and reside in the country. Inhabited islands in Male' atoll began developing guesthouses to accommodate overseas visitors who were looking for cheaper accommodation than those available in the resort islands. It was believed that the visitors who opted for such accommodation were also the type of visitors that the government thought that the society should not mingle with. Towards the late 70s and early 80s this type of tourism grew in popularity and so did the stories of the undesirable effects of this type of tourism, such as the introduction of drugs to the locals. The government was quick to impose measures to control it. In 1984, the

permits given to run guesthouses for foreigners on inhabited islands were withdrawn (Ministry of Tourism, 1998).

Today, accommodation for foreign visitors, outside the tourist resorts is only permissible in Male' island, under the watchful eyes of the government and the predominantly Male' based police. Foreigners travelling to inhabited islands, except those travelling on day trips from the resorts to nearby inhabited islands, are required to get a special permit from the government and are expected to be properly attired during their visit (Ministry of Tourism, 1998).

In spite of such strict measures, it is virtually impossible to prevent the influence of such visitors on the Maldivian society, although the extent of influence may be much less compared to other tourism-oriented countries where the tourist population intermingles with the local populations. At least two avenues, for the flow of influences from the visitors to the local population, can be identified.

One, and perhaps the more pervasive, mode of influence will be through the Maldivian labour force working in various occupations in the tourism sector. Many of these workers come directly from their rural islands to work in the resorts where they come into direct contact with the visitors. Many of the resort workers being young, in their late teens or early twenties, are most likely to be open to new ideas and influences, and take back their experiences and ideas with them on their return trips to their home islands.

The other avenue is through the interaction of the locals and the visitors in Male' island where there are no restrictions on the intermingling between the two. In fact, the interaction between the local population and the visitors can be greater when there is no restriction imposed on their movement, as is the case in Male' island.

The economic reward that has been brought about by the introduction and growth of tourism in the country has prompted the government to encourage the rapid expansion of the tourism industry. Initially all tourist resorts were located only in Male' atoll only. With the increasing demand for bed capacity

in the Maldives a ten-year tourism development Master Plan was formulated and under this plan a new tourism zone was established in Ari atoll just outside Male' atoll in the 1980s (Ministry of Tourism, 1998). The second Master Plan was formulated in 1995, under which six atolls were identified as new tourism zones and new islands were leased for resort development to successful bidders (Ministry of Tourism, 1998).

As tourism spreads further and further into the rural atolls of the Maldives, the likelihood of increased interaction between the tourists and the local population increases. Although some writers (for example, Dumroes, 1993:71) note that, tourism has no effect on the Maldivian culture, and that no island is licensed as a tourist resort if interference to local island economy is anticipated, as mentioned in Chapter 11, if tourist resorts are located within close proximity of the inhabited islands in the outer atolls, there will be greater likelihood for females to be involved in the tourist resort employment, thus increasing the possibilities of influence to the local communities.

Rapid growth and spread of tourism in the country not only holds increased opportunities for the interaction between the visitors and the local populations, but also increased pressures on the fragile environment of the islands as well. In this context some of the initiatives taken by the government are worth noting here.

Recognising that about 30 percent of the visitors to the Maldives would go diving and thus the importance of the sustainability of the natural beauty of the reefs of the country, 30 sites were identified to be declared as protected areas throughout the Maldives and 15 of these were decreed by law as protected sites in 1995 (Ministry of Tourism, 1998). Even in spite of such bold steps, the lack of awareness and will, both in the tourist resorts, and among the local tourist entrepreneurs (Domroes, 1993:81) and the Maldivian population in general, means that the negative impacts of tourism growth will continue to affect the fragile environment of the country. This is further exacerbated by the problems associated with the surveillance and monitoring of the widely dispersed islands.

Apart from the destruction to the environment caused by factors such as the dropping of anchor on the reef by fisherman, mining of coral for construction, and dumping of waste into the ocean, the direct impacts of the tourism industry also pose threats to the sustainability of the environment. Some of these are related to the numbers of arrivals such as, pollution of the sea water due to the discharge of waste water, sewage and garbage from the resorts and other by the resort developers such as, construction of boat fairways through the reefs and cutting of outlets through the outer reefs of islands for divers and snorkelers.

The governments and the private sector in many island countries around the world have long recognised the importance of tourism for economic diversification, particularly the creation of employment, human resources development, and the multiplier effects of foreign exchange earnings (Lockhart, 1997: 3). The Maldives is no exception. The economic advances achieved by the Maldives in the past 25 years, largely through tourism revenue, has been remarkable (see Chapter 10). Tourism growth has prompted the growth of other economic activities as well. It has created opportunities for employment, investment and creation of wealth at levels that Maldivians have never seen before.

The large visitor numbers have also improved the otherwise limited economies of scale due to the small size of the Maldivian population. Improved economies of scale are beneficial not only for the growth of business and trade but it also benefits the general population by increasing the accessibility to a wider range of food and consumption goods at lower prices. Varieties of fruits, vegetables, and meat that were previously virtually non-existent in the Maldives has now become widely available in the market, especially in the urban area. The difficulties in transport of such perishable goods still prevent the majority of the rural population from getting ready access to such goods.

The other benefit of the increasing numbers of visitors is the growth and diversification of employment opportunities in the country. These opportunities exist directly in the tourist resorts, either as employees or as

contract workers in the resort construction and renovation, and in other sectors such as transport and trade that are related to the tourism industry.

7.2.4 Maldivians Overseas

There has been some amount of out migration of Maldivians in the recent years. Most of these migrants are families who migrate to neighbouring countries, India and Sri Lanka, and sometimes Malaysia and Singapore. Most of them migrate for a pre-determined time period, with the specific objective of providing better schooling for their children at International Schools in these countries, and/or in some cases, to provide essential medical care for a member of the family. Migration to India is mostly restricted to cities in South India, such as Trivandrum, Bangalore, and Madras. Migrants to Sri Lanka live mostly in and around Colombo, while migrants to Malaysia live in Kuala Lumpur. The exact number of Maldivians living overseas is not known. However, it is generally believed that their numbers are around a couple of thousand.

7.3 Growth and Spatial Distribution

7.3.1 Population Growth

At the turn of the twentieth century, when the first complete census of population was taken in the Maldives in 1911, the total population was enumerated at 72,237 persons (Government of Maldives, 1981). The first modern census, covering comprehensive data on the social and economic conditions of the population was, however, conducted in 1977. The population count of this census was 142,832, a little less than a double of the population enumerated in 1911. The growth rate of the population was so slow prior to the 1960s that the annual growth rate of the population varied between 0 and 2 most of the time. Since the 1960s it has remained high at mostly over 3 percent per annum. The most important factor in this is probably the introduction of modern health care in the country and its impact on the survival rates of the population.

The populations of all atolls increased significantly over the ten years from 1985 to 1995 (see Table 7-7). The absolute increases indicate that the increases are greatest in the atolls with larger populations and that in these atolls the rate of increase is more or less uniform. A closer look at the population growth rates reveals that, in fact, the rate of growth varies considerably from atoll to atoll. For most atolls the rate of growth was above three percent per annum.

Table 7-7: Population by Atoll, 1985 and 1995 and Inter-Censal Growth Rates

Atoll	1985		1995		Percent exponential growth per annum
	Population	Percent	Population	Percent	
North Thiladhummathi	9899	5.50	13676	5.59	3.2
South Thiladhummathi	10850	6.02	15365	6.28	3.5
North Miladhummadulu	7509	4.17	10462	4.27	3.3
South Miladhummadulu	6864	3.81	10103	4.13	3.9
North Maalhosmadulu	9416	5.23	12953	5.29	3.2
South Maalhosmadulu	6982	3.88	8712	3.56	2.2
Faadhippolhu	6414	3.56	8038	3.28	2.3
Male' Atholhu	8734	4.85	11675	4.77	2.9
North Ari	3216	1.79	5260	2.15	4.9
South Ari	4645	2.58	6695	2.73	3.7
Felidhu Atholhu	1419	0.79	1678	0.69	1.7
Mulakatholhu	3490	1.94	4859	1.98	3.3
North Nilandhe	2148	1.19	3165	1.29	3.9
South Nilandhe	3568	1.98	4793	1.96	3.0
Kolhumadulu	6949	3.86	9545	3.90	3.2
Hadhdhummathi	7212	4.00	10156	4.15	3.4
North Huvadhu	6054	3.36	8121	3.32	2.9
South Huvadhu	8905	4.94	12031	4.91	3.0
Foammulaku	4983	2.77	7004	2.86	3.4
Addu	14957	8.31	18004	7.35	1.9
Male' (Capital)	45874	25.47	62519	25.54	3.1
Total	180088	100.00	244814	100.00	

Source: Computed by the author from census data

7.3.2 Spatial Distribution

Given that the population of the atolls are dispersed over several inhabited islands within each atoll, and the socio-economic characteristics greatly vary between the islands within the same atoll, the population growth rates are also expected to vary accordingly. It is possible that even in an atoll with a relatively low level of population growth for most islands, a few islands with very high population growth would inflate the average population growth rate

of the atoll significantly. Reasons for the high population growth rates in some atolls and low rates in others can best be understood by studying island level data or household level data.

The past 30 years have seen the growth of internal migration and redistribution of the population within the geographical boundaries of the Maldives archipelago. The most significant is the growth of Male' island. It is the only island that has gained significant numbers of its population through internal migration. The factors that have contributed to the growth of the population of Male' island have been discussed earlier in this chapter.

Table 7-8: Numbers of Islands by Population Size, 1995 Census

Population Size	Number of Islands	Cumulative Percent
<200	11	5.5
200 - 299	10	10.6
300 - 399	27	24.1
400 - 499	27	37.7
500 - 599	23	49.2
600 - 699	16	57.3
700 - 799	16	65.3
800 - 899	9	69.8
900 - 999	10	74.9
1000 - 1999	35	92.5
2000 - 2999	7	96.0
3000 - 3999	3	97.5
4000 - 5999	2	98.5
6000 - 8999	2	99.5
62101	1	100.0

Source: Computed by the author from census data

The rest of the population of Maldives is widely scattered across the entire archipelago of its 1200 odd islands. Many of the islands have populations that are so small that any form of economic activity on an industrial scale is inconceivable. It can be seen from Table 7-8 that a quarter of the 200 odd inhabited islands of the Maldives have populations of less than 400 persons on each, and close to half of the inhabited islands have populations that are under 600 persons. Including the capital Male', which has a quarter of the entire population of the country, only four percent of the islands have populations over 2000 persons. The widely scattered nature of the population poses some formidable obstacles in the delivery of essential social and economic services in an equitable manner to the entire population of the country.

While, on the one hand, the geographical scatter of the population poses these challenges, on the other hand, population congestion in some of the islands create different types of challenges in the social and economic development, or more appropriately, to merely sustain the present levels of life for the residents of such islands.

In the Maldives, where the average size of the islands is extremely small and in most cases the possibility of expanding the land area through land reclamation from the surrounding lagoons is not a viable option, population density in terms of persons per hectare of land area provides a very real measure of the congestion and the resulting strain on every aspect of life on these islands. From the depletion of the natural fresh water aquifer to the sanitary disposal of sewage and waste, from the lack of recreational space to overcrowded living conditions in the housing units, the problems that arise from high population densities are wide and varied.

Table 7-9: Number of Islands by Land Area, 1960

Hectares	Number of Islands	Cumulative Number of Islands	Cumulative Percent of Islands
<5	4	4	2.0
5 - 9.9	13	17	8.5
10 - 14.9	15	32	15.9
15 - 19.9	31	63	31.3
20 - 24.9	23	86	42.8
25 - 29.9	8	94	46.8
30 - 34.9	19	113	56.2
35 - 39.9	7	120	59.7
40 - 44.9	11	131	65.2
45 - 49.9	11	142	70.6
50 - 54.9	7	149	74.1
55 - 59.9	6	155	77.1
60 - 69.9	4	159	79.1
70 - 79.9	4	163	81.1
80 - 99.9	9	172	85.6
100 - 149.9	10	182	90.5
150 - 199.9	8	190	94.5
200 - 299.9	8	198	98.5
300 - 512.4	3	201	100.0

Source: Computed by the author from unpublished data from Ministry of Planning, Human Resources and Environment.

Land areas for the islands of Maldives are available from satellite photographs of the islands by the French SPOT satellite imagery, which were taken in 1960.

It is possible that land areas of some islands may have changed during the past 40 years, some due to natural causes such as erosion, while others due to artificial causes such as land reclamation (Ministry of Planning, Human Resources and Environment, unpublished data). Due to the smallness of the islands of the Maldives, land areas are measured in hectares, instead of square kilometres, which is the more commonly used measure of land area. In this aspect it is important to shed some light on the land areas of the islands of the Maldives in order to put the reader in proper perspective.

As seen in Table 7-9, the smallest inhabited island of the Maldives is less than five hectares in area and the largest inhabited island of the Maldives is 512.4 hectares in area (100 hectares = 1 square kilometre). It can be seen from the same table that, of the 201 inhabited islands of the country, 70 percent are less than half a square kilometre in area and 85 percent are less than one square kilometre in area. Male' island, the capital, with over a quarter of the total national population is just 177.3 hectares in area.

Table 7-10: Spatial Distribution of Population in the Maldives, 1995 Census

Persons Per Hectare	Number of Islands	Cumulative <		Cumulative >	
		Cumulative Number of Islands	Cumulative Percent of Islands	Cumulative Number of Islands	Cumulative Percent of Islands
<10	57	201	100.0	57	28.4
10 - 20	49	144	71.6	106	52.7
20 - 30	28	95	47.3	134	66.7
30 - 40	23	67	33.3	157	78.1
40 - 50	9	44	21.9	166	82.6
50 - 60	9	35	17.4	175	87.1
60 - 70	2	26	12.9	177	88.1
70 - 80	7	24	11.9	184	91.5
80 - 90	7	17	8.5	191	95.0
100 - 120	3	10	5.0	194	96.5
200 - 400	6	7	3.5	200	99.5
538	1	1	0.5	201	100.0

Source: Ministry of Planning, Human Resources and Environment, Unpublished data

In terms of population densities, some islands of the Maldives, including the capital Male' island can be included among the most densely populated places in the world. The population density of Male' island as per the census of 1995 was 352 persons per Hectare, or over 35,000 persons per square kilometre. However, there are other islands of the Maldives with much higher population

densities although their populations are much smaller. One is the island of Thulhadhoo in South Maalhosmadulu atoll, which has a land area of 5 hectares and a population density of 369 persons per hectare (1995 Census). By far the most congested island of the Maldives is the island of Kan'dholhudhoo in North Maalhosmadulu atoll, which has a land area of just 4 hectares and a population density of 538 persons per hectare (1995 Census). Of these two islands, Thulhadhoo's population density will decline when the currently ongoing programme of land reclamation from its surrounding lagoon provides new land for the people of this island. This may not be an option for Kan'dholhudhoo Island, as the shallow lagoon surrounding the island is virtually non-existent. Table 7-10 provides an illustration of the spatial distribution of the inhabited islands of Maldives.

There are no easy solutions to the problems of the spatial distribution of the population in the Maldives. While there is an urgent need to relieve congestion on some islands, the need to aggregate the small pockets of population living on scattered islands on to fewer and bigger population centres remain equally crucial. Although these are both economically, as well as emotionally, extremely costly measures to undertake, the sustainability of development of the Maldives seems to depend on the success of achieving such a scenario.

With the objective of alleviating the population pressures on Male' island by providing the additional land for housing for its residents, the government of Maldives launched a massive land reclamation project on the 16th of October 1997. Under this project an artificial island is being created, in the large shallow lagoon of Hulhule island which lies adjacent to Male' island and which consists of the international airport, to provide housing space for a population of 125,000 (Haveeru Daily Online, 1998). This island, due to its physical association with the two islands, Hulhule and Male', has been named Hulhumale'.

In addition to the immense financial costs of creating the land and providing the basic infrastructure for future settlement of population, and later, for the coastal protection measures that has been required in Male' island itself, it is

highly likely that such a massive land reclamation project will have unpredictable effects on the local marine environment. Although the government claims that no significant environmental impact of the project has been evident so far, the fact that these claims are based purely on general observation and not on sound scientific observation erodes the credibility of such claims. The long-term implications of such large-scale disruptions to the fragile environment are likely to be imminent.

7.4 The Implications for the Labour Force

Economic developments that the Maldives has witnessed in the past three decades have relied to a great extent on the labour supply of rural to urban migrants. From the time when fishing and agriculture ceased to be the only major economic activities in the national economy, the flow of migrants from the rural areas to the urban centre has increased tremendously. Huge demands have been created in the urban region for skilled workers ranging from service-oriented occupations in the tourist resorts to unskilled labourers in the construction.

The heavy flow of migration from the rural to the urban areas has undoubtedly been beneficial for the development and diversification of the national economy by creating a large population centre that has improved the economies of scale. The benefits for the rural families from the growth of an economy that is largely centred around the urban area comes from the increased demands for their products and services at highly attractive prices thereby allowing them to invest more in improving the standards of lives of their families.

In some atolls, such as Addu, which provided a large share of the tourist resort employment and employment in the trade sector, many communities have been feeling the shortage of working age people, especially men, and reduced economies of scale. Diseconomies of scale are an inherent nature of small island countries throughout the world (See for example, Overton, 1993:267). While internal migration has caused diseconomies of scale in the sending areas

of the Maldives and other similar small island nations; it is through internal migration that, economies of scale have been created in the receiving areas. In the case of Maldives, Male' island has been a natural choice as the receiving area for several reasons. Firstly, its strategic location, almost halfway between the northernmost and southernmost atolls of the Maldives has made it an ideal location to rule the country for centuries. Secondly, its strategic location on one of the main entrances to the Maldives archipelago by sea makes it easily accessible for international shipping, and is well endowed with a natural harbour that is capable of harbouring even the large passenger liners that frequent the country today. Thirdly, and probably as a direct consequence of the above two factors, Male' island has been the seat of the government since its recorded history began with the detailed accounts of Ibn Batuta in the 14th Century A.D. (Hakluyt Society, 1994).

While internal migration has worked to create a large population centre in Male' island and has thus achieved a viable economy of scale for economic development, social and environmental problems that are caused by population congestion are creating concern among the people. As a result, since the beginning of development planning in the Maldives in the 1980s, several initiatives have been taken by the government to create alternative growth centres in different parts of the country (National Development Plans, various years). Some of these strategies have not worked and have since been abandoned in favour of the present policy of development of two regional centres, one in the north and the other in the south (Ministry of Planning, Human Resources and Environment, 1998).

In the past there have been incidents where the people from one island were transferred to another inhabited island, merging the two populations and creating a larger population. These were mainly for religious reasons and were in most instances against the people's will³⁵. At present the government does not have a policy of forced repatriation of the population from one island to the

35 Based on religious grounds where a minimum population of 40 adult males are required to perform the Friday prayers.

other, but realising the problems of developing the socio-economic conditions of small island communities scattered over several islands, the present policy of the government is to convince such small communities to take their own initiative by approaching the government to facilitate them to consolidate with the population of another island. Consolidation of small populations to larger islands is currently a part of a longer-term population redistribution plan (Ministry of Planning, Human Resources and Environment, 1998).

If the two growth centres succeed in playing the central role for commerce and economic services for the peoples of the surrounding atolls, it is expected that some of the migrant workers from these areas who are in Male' island will be diverted to the respective growth centres in the longer term. The gap they would create in the labour force in the Male' region will be filled in by the changing age structure of the population (see Chapter 8).

In addition to this, the spread of tourism into the distant atolls is also expected to curb the growth of migrant population in Male' region. The effect of the opening of tourist resorts in the new tourism zones in the atolls in 1998, on the labour market in and around Male' is yet to be seen. It would seem that those who have migrated from those atolls to Male' island with their families, to provide better quality education for their children, will not move back immediately to their respective atolls in spite of the availability of resort employment in the atoll. Those who will be seeking employment in these new resorts will, most probably be, those persons leaving island schools after the completion of secondary level education in their respective islands. In the interim, those resorts will have to manage with a large proportion of their work force comprising of expatriate workers.

7.5 Summary and Conclusions

Two significant events during the 70s contributed to a sudden increase in the rate of growth of the urban population of the Maldives. The first was the government organised transfer of the population from the adjacent island of Hulhule' to Male' island in order to facilitate the expansion of the airport. The

second was the closure of the British Royal Air Force base from Gan island in Addu atoll, prompting record levels of unemployment and, consequently, mass migration to Male' island in search of employment.

While the first event had no lingering effect on the rural to urban migration trends, the second event marked the beginning of an irreversible flow of migration from the southern atolls to Male' island. With the limited land area that is available on Male' island, the most significant effects of growth in rural to urban migration were, the increase in the demand for housing and the skyrocketing of rental rates, and the overloading of the socio-economic infrastructure of Male' island.

Although the socio-economic infrastructure was being put under severe strains by the increasing population, it also provided the necessary manpower for the growth of tourism, trade, and related sectors in and around Male' by catering to the growth in demand for labour. The growth of the economy in turn provided employment opportunities for the workers from the islands who, either migrated to Male' island with their families, or operated as circular migrants by working in and around Male' island and sending their incomes to their families in their home islands. Whether it is permanent or short-term, internal migration has been an important feature in the socio-economic development of the country and especially of the populations of the rural islands of Maldives.

Unlike many of the island developing nations of the Pacific, where remittances from their natives living and working in the more developed overseas urban centres of the region makes a substantial contribution to their national incomes (Brown, 1994; Brown, 1995), neither international migration of its people, nor their remittances to the national economy, are major features of the Maldivian economy. However, remittances from Maldivian seamen working on board locally owned, internationally operated shipping liners, and on foreign shipping liners, have been estimated to contribute significantly to the national income (see chapter 7).

Like any other island developing country, the nature of the spatial distribution of the population in the Maldives necessitates that internal migration and the creation of a major population centre, be a condition for successful economic development. However, the flow of migration from the rural areas to the urban areas can only be positive for development if the urban economy is capable of absorbing such a growth in the urban population. Maldives has been extremely fortunate in this respect.

The fastest growth in the rural to urban migration, which occurred during the 70s and the 80s as a consequence of the withdrawal of the British from Gan, did not happen in an era of development planning in the Maldives and hence, there was no conscious fallback plan for the large pool of unemployed from Gan. It was merely by coincidence that, a few years earlier, the Maldives was discovered by an Italian tour operator as a viable destination for international tourism and thus created a demand for exactly the similar types of skills that were possessed by those ex-workers from the Royal Air Force Base in Gan. Demand for food and construction materials for the growing tourism industry created further opportunities for import and trade businesses, creating additional demands for labour.

The most salient feature of the native migrant labour force in the Maldives has always been its male dominance. Socio-cultural factors in the Maldives prevent females from taking advantage of the demand for labour created by the tourism sector and to a great extent, the trade sector – the fastest growing sectors of the Maldivian economy in recent years. The most important reasons for people to migrate from the rural to urban areas are education and employment. This is due to the disparities in the levels of economic development and access to social services between the rural and the urban areas of the Maldives. It appears that while the most important reason for people to migrate to the urban area is education, the availability of schooling in the rural areas is imposing some level of discrimination in terms of the quality of education obtained by the males and females. As higher levels of schooling becomes available in the rural areas, male children are more likely to be sent to the urban area for superior schooling while females are more likely to remain

with their parents in the rural areas and attend rural schools. To some extent, this effect was seen in the qualitative interviews conducted by the present author.

...in sending children for education to Male' or another place, I will feel very sad to do it because I will not have the assurance that my child will get the same attention and care that I will extend if the child were with me...if the child is determined to study further and the only option is to send the child away I will not stop it...but I dare not send my daughter like that because of the incidents that some girls have faced while away from the home islands in Male' or for that matter any other island (39 years old female from Mahibadhoo island, December, 1998).

It is this same reluctance on the part of the parents that prevent unmarried rural girls from seeking employment in the urban economic sectors. Female migration driven by employment is thus negligible, while employment is the most important reason for the migration of males.

As it is the case within an island community, females are more likely to move to the husband's island after marriage than vice versa. After education, marriage and family migration are the most important reasons for the migration of females in the Maldives.

International migration of Maldivians has not reached significant levels as yet. In fact, those families that are at present living overseas mostly depend on remittances made to them by their families, their businesses, and from the rents of their property, to support all costs of their stay in the host countries, including the cost of educating their children. In addition to the remittances made by expatriate workers, this is likely to have a significant negative impact on the national income.

The problem of growing numbers of expatriate workers in the country will, to a great extent, be relieved when the effects of past high fertility is felt on the labour force in the coming years. However, conscious efforts will be needed by the government to explore all means to provide adequate training to the secondary school graduates in order to effectively replace the expatriate workers in skilled occupations with local personnel. In addition to the

significant proportion of the GDP that is being lost to their remittances abroad, the expatriate workers also add to the strains on the socio-economic infrastructure and housing problems that are being faced in the country. Those expatriates that are least likely to be replaced by indigenous labour are factory type of employment of unskilled or semi-skilled females and manual labourers.

The growth in international tourist arrivals is expected to continue to be the most important driving force of the Maldivian economy. Growth in demand for more resort accommodation has already seen tourism gradually spreading to the outer atolls. If strict guidelines are followed to keep the foreign visitors from freely mingling with the local populations, as it has been done in the past, the negative impacts of such growth on the society can be minimised. On the other hand, the growth in international tourist arrivals and the expansion of tourism into the atolls is expected to benefit the island economies by providing employment opportunities in these resorts and by opening up markets for their products such as fish, local fruits and vegetables, and various types of handicrafts. Such opportunities would be especially beneficial for the women of the islands.

The centralised growth of the economy in the Male' region and the resulting flow of male dominated migration from the rural to the urban areas have created a deficit of working age males in many of the atolls. This deficit is likely to affect the viability of certain rural development programmes. Even if the types of employment opportunities created in the rural areas are female oriented, such as garments production factories, it is likely that many rural females, especially those who have young children, will not be able award the kind of commitment demanded by such factory oriented production work, without inflicting negatively on the quality of childcare. This is probably the reason that such ventures have so far failed to get adequate numbers of females from the rural areas in the past, in spite of the recent increase in the numbers of rural females that are not economically active. The viability and the sustainability of such ventures would also be more guaranteed in more

populated islands. The existing pattern of the spatial distribution of the population is not favourable for sustainable economic development³⁶. In this context, the current policy of the government to consolidate small populations from different islands on to larger islands to create improved economies of scale is likely to be beneficial in the long term.

³⁶ Although from a purely environmental perspective smaller populations would be more desirable.

Chapter 8: Age and Sex Structure

In the last three chapters we have looked at the three components of population change – fertility, mortality and migration – in relation to human capital and development. Together, the effects of fertility, mortality, and migration shape the age structure of the population: the age sex structure of a population is roughly indicative of the past demographic trends, and how fertility, mortality and migration interact within that population. It also provides a snapshot of the level of transition from a high fertility-high growth population to a low fertility-low growth population. As a population is exposed to modern health and maternity care, among other aspects of modernisation, mortality begins to decline. The onset of fertility decline is known to lag behind the onset of mortality decline in almost all populations (see Kirk, 1996).

Largely as a result of the gap in mortality and fertility supplemented by the ‘ski-jump’ effect, which occurs at the onset of fertility decline (Dyson and Murphy, 1985), natural growth of the population accelerates until the effect of declining fertility is strong enough to revert it. In addition to providing reflections of the past trends in fertility and mortality, the age structure of a population also provides some indications for the future demands for social and economic services of the population. This chapter discusses the changes in the age and sex structure of the population of Maldives in the past. The implications of these changes for the future sizes of the school age population and working age population will be discussed in Chapter 9 of this thesis.

8.1 Age Structure

The age structure of the population of Maldives is changing from a broad based pyramid shape that is typical of populations with declining mortality and high fertility, to a pyramid with a gradually narrowing of the base. The narrowing of the base suggests the effect of recent fertility decline. Overall, for the whole country, it was only the population pyramid of 1995 that showed a slightly smaller proportion of population in the lowest age group 0-4 than the age group 5-9. However, observation of rural and urban populations shows a slightly

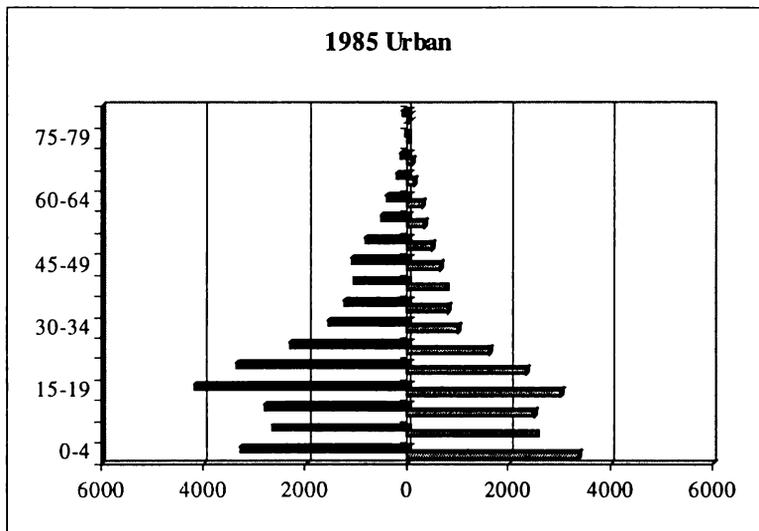
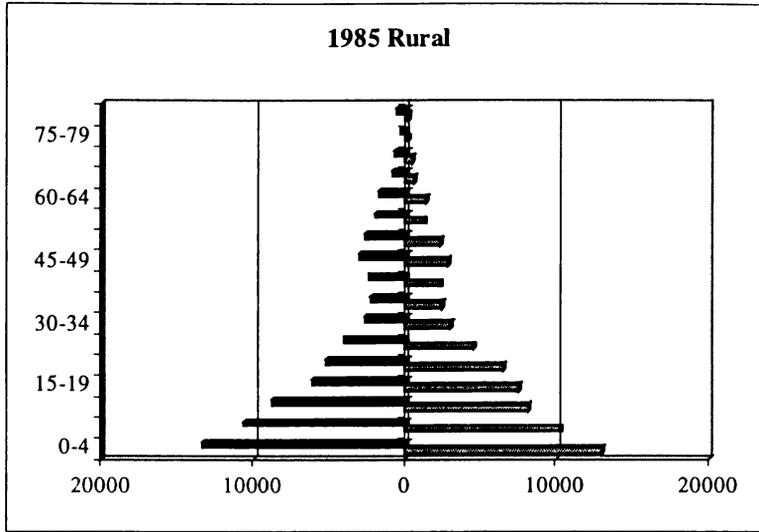
different picture. Figure 8-1 shows the age pyramids for the urban, rural and total populations of Maldives for the census years 1985 and 1995. The left-hand side of the pyramids depict males in five-year age groups and the right-hand side of the pyramids depict females in five-year age groups.

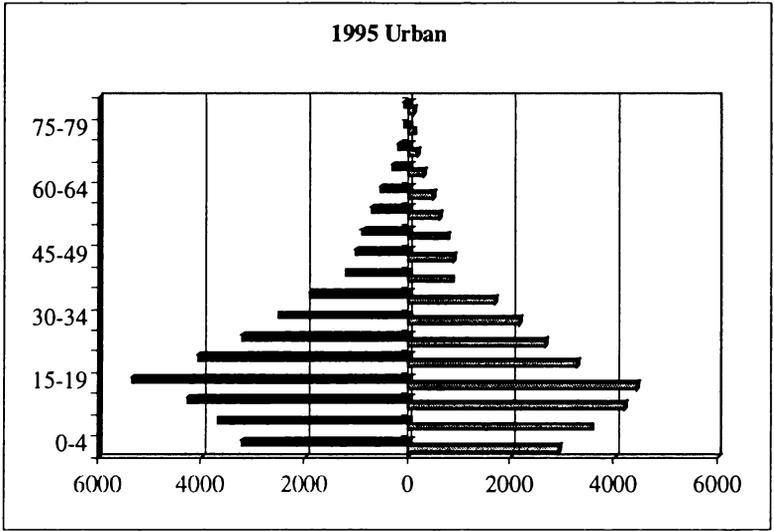
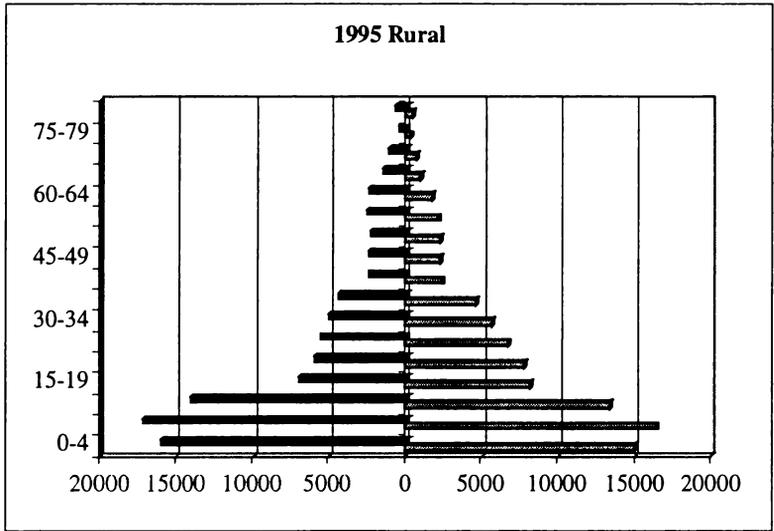
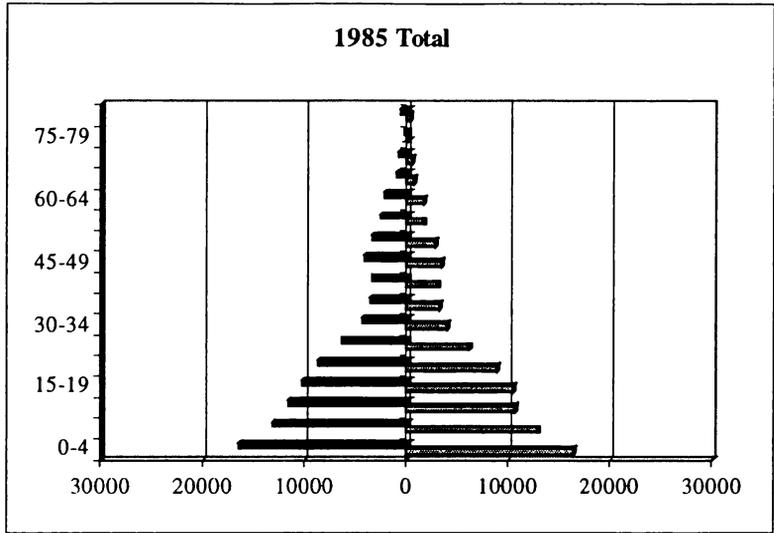
The age structure of both the urban and the rural populations in 1995 clearly showed the effects of fertility decline. The effect is stronger among the urban population than the rural. The effects of extremely low birth rates and the increasing longevity of life over a long period gradually augments the top part of the pyramid, making the age pyramids of such populations look more or less like a barrel. The population pyramid of the total population of the Maldives, although showing signs of narrowing at the base in 1995, is still far from this stage of demographic transition.

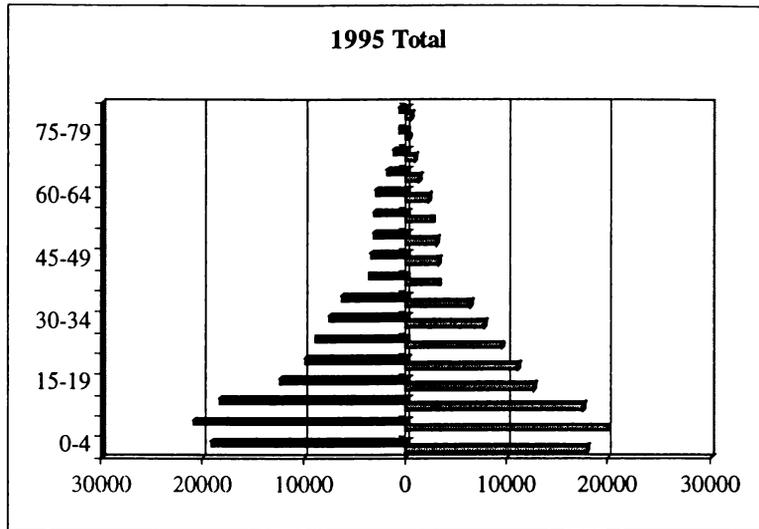
With comparatively larger and larger proportions in the younger age groups, the population of Maldives is growing younger. In 1977 the median age of the population was 17.25 years. By 1995 the median age of the population has declined to 16.72 years. Although this appears to be a slight decline, for a population with already a young age structure, these trends mean growing numbers of children under the age of 15, leading to increased costs for the provision of basic services such as education, health and shelter.

The differential trends in the urban and rural areas are interesting. The median age of the urban population has been increasing over the years while that of the rural population has been declining. In 1985, the median age of the urban population was 19.02 years while that of the rural population was 16.11 years. By 1990 these figures have changed to 19.68 and 15.46 for urban and rural populations, respectively. As the median age of the urban population increased to 19.81 years in 1995, the corresponding figure for the rural population declined to 14.85 years, increasing the urban-rural gap in the age composition of the population.

Figure 8-1: Population Pyramids, 1985 and 1995, Maldives, Rural, Urban and Total (in numbers of persons). Left hand side represents males while the right hand side represent females.







Source: Computed by the author from census data

These trends where the median age of the urban population increases while the median age of the rural population decreases indicates the effects of two possible factors. One is the effect of rural to urban migration of, mainly the working age population and the secondary school age population. The other is the effect of the differences in the family size preference and the accessibility of family planning methods for these two populations.

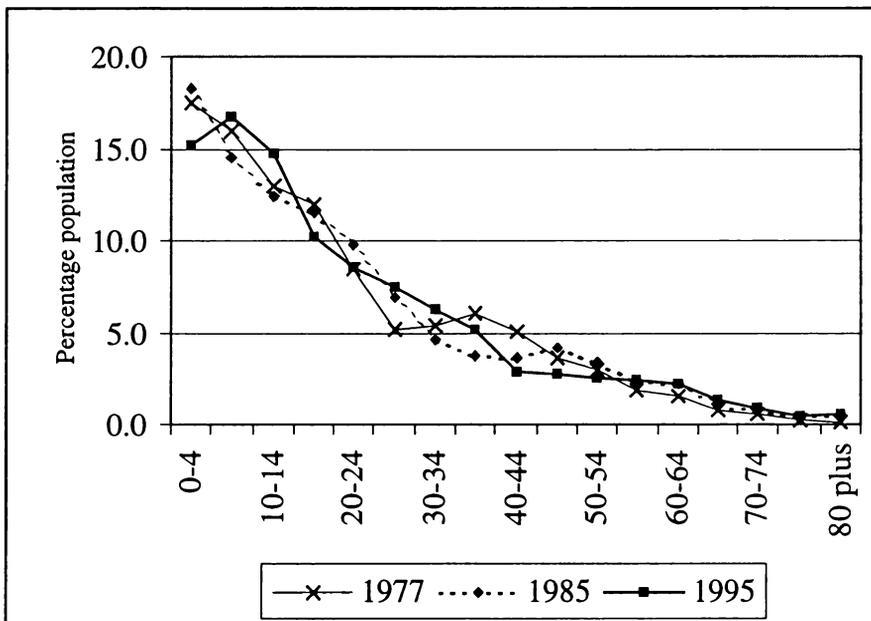
As the population of the country becomes younger, the age dependency rate of the population increases. Age dependency is measured by the ratio of the combined child population and aged population to the population of intermediate age and is measured by relating persons under 15 and 65 and over to persons in the ages 15 to 64 (Shryock et al, 1976:133). The variations in the dependency ratio largely reflect the dependency burden of the population aged under 15, the effect of the older ages being very minimal (Shryock, et. al., 1976: 133).

According to this measure of dependency, the age dependency of the population of Maldives has been increasing. In 1977, the age dependency was 0.89 indicating that for every 100 persons in the working age group there were 89 persons in the dependent age groups. In 1985 the dependency ratio was 0.91, increasing to 0.96 in 1990. The age dependency ratio was almost one to one at 0.98 in 1995.

The age dependency ratio is only a rough indicator of the dependency burden of a population. In a developing nation such as the Maldives, where the large majority of women are not in the labour force, but are full-time homemakers who are not even marginally employed in subsistence economic activities, the actual economic burden of the population will undoubtedly be much higher. The economic burden of the population is defined as those who are not in the labour force in the total population expressed as a percentage of those who are in the labour force (Shryock, et. al., 1976: 133).

In addition to these observations, changes in the age distribution of the population from 1977 to 1995 shows the momentum effect of the past demographic factors on growth and composition of the population. While the population projects presented in the next chapter and the implications of these projections on educational demands and the labour force in the future are discussed in Chapter 10, it would be useful to briefly discuss the age structural changes that have occurred in the recent past.

Figure 8-2: Percentage Distribution of Population by Age Group, Maldives, 1977, 1985 and 1995 Census



Source: Prepared by the author from census data

As shown in Figure 8-2 there has been a significant shift in the youngest age groups of the population from 1977 to 1995, when the proportions in the age group 0-4 declined substantially from about 17 percent of the population in 1977 to about 15 percent of the population in 1995. This decline can be attributed to a significant decline in fertility observed during the period 1985 to 1995, as we have seen in Chapter 5.

Table 8-1: Population Under Age 10 by Five-Year Age Groups , Maldives, 1977, 1985, and 1995 (absolute numbers)

Age group	1977		1985		1995	
	Persons	%	Persons	%	Persons	%
0-4	23,837	17.4	32,922	18.3	40,845	15.1
5-9	21,783	15.9	26,050	14.5	35,948	16.7

Source: Computed by the author from census data

While there has been a decline in the percentages in the age group 0-4, in fact, the absolute numbers in these age groups increased during this period (see Table 8-1). This is caused by the effect of population momentum due to high fertility and increasing survival chances in the preceding decades. It appears that with these compositional changes in the population age structure, the population of Maldives is transitioning from a 'phase of simple momentum' to a 'phase of population waves', with the built in momentum carrying with it a pattern of oscillating and decelerating effect on population growth (absolute numbers). (see Pool, 2000).

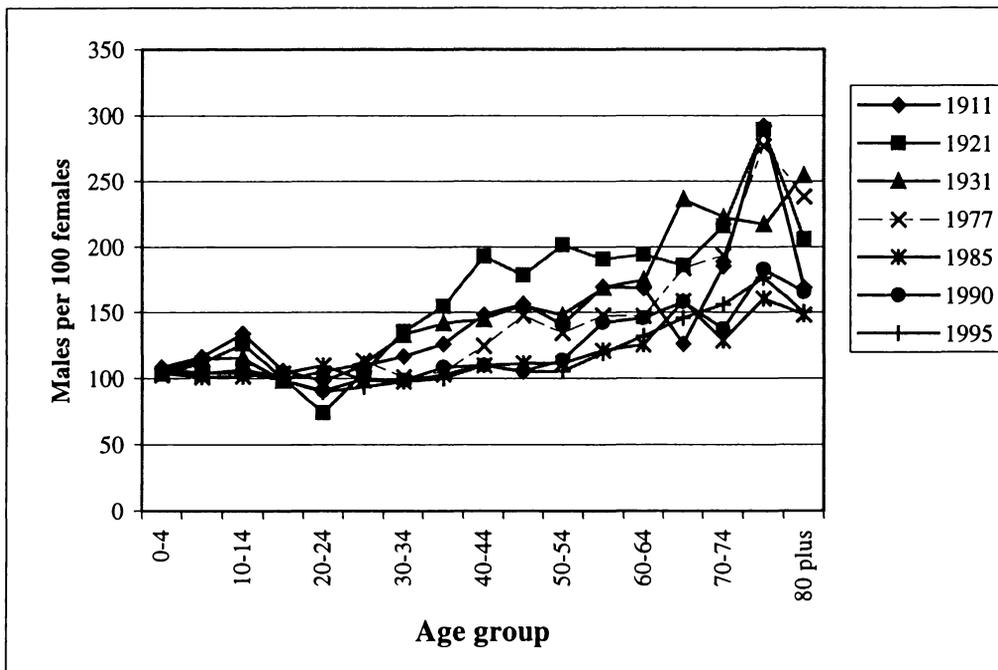
8.2 Sex Composition

Throughout the century, sex ratios (defined as males per 100 females) have remained at slightly above 100 in the youngest age group 0-4, in the Maldives. However, they increased considerably with age. In view of this, perhaps the most interesting observation about the sex ratios by age is the gradual equalling of the number of males and females in the age groups 5-9 and 10-14 during the past century. In the next age group, 15-19, the sex ratios quickly fell to slightly below 100 in 1911 and in the other censuses too, it remained close to 100.

All censuses indicate a considerable deficit of females in the ages above 25. As expected, the deficit is much more pronounced, in fact, extremely high in

the early censuses. This probably reflects the high incidence of maternal mortality in the Maldives in the past. Even as late as 1977, this deficit remained considerably high. From 1985 onwards, all censuses show that the sex ratios in all ages were approaching 100, indicating the improvements in the survival of females in the Maldives. It would be some years before the sex ratios at older ages start showing a deficit of males in the older ages, as those females who have already experienced high fertility and other ill effects will gradually pass through the age structure giving way to younger cohorts of women with better life experiences and lower mortality.

Figure 8-3: Sex Ratios (males per 100 females) by Age Group From Selected Censuses of Maldives, 1911 - 1995



Source: Prepared by the author from census data, various years

While part of the distortions in the sex ratios by age for the earlier censuses may be attributed to differences in age reporting between the sexes and under-enumeration of females, another plausible explanation is that the survival chances were more favourable for males. As recently as 1977, the age specific sex ratios of the population of Maldives showed a sharply increasing trend with increasing age, and this pattern closely resembled those of the earlier censuses. This consistency attributes a degree of reliability to the age specific sex ratios

of the earlier censuses, as the census of 1977 was conducted according to United Nations recommendations, with financial and technical assistance that provided adequate resources to conduct it efficiently.

Sex ratios from the 1985, 1990, and 1995 censuses show significant shifts in the sex composition of the population, reflecting the overall improvements in the status of women in the country and in particular, the increases in the survival of females.

8.3 Summary and Conclusions

Assuming that the age reporting at the younger ages is of acceptable quality in the Maldives (see Chapter 4), age structures from the different censuses show that the effects of fertility decline are beginning to take shape in the population pyramid; a gradual narrowing at the base of the pyramid. This effect is stronger in the urban area, where the effect of fertility decline is greater (see Chapter 5).

High fertility and relatively lower mortality levels in the past two or three decades have swelled up the younger cohorts of the age pyramid - the population of Maldives has been growing younger. However, there is a huge difference in the age structures of the urban area and the rural areas. In the urban areas, due to the large flow of the working age circular migrants from the rural areas, the population age structure has grown older, while in the rural areas where there is a deficit of working age persons, especially males, the opposite trend has been occurring. To some extent, the effect of declining fertility levels in the urban area may also be accountable for this trend.

Due to the changing age structure of the population in the past, the age dependency burden has increased significantly. In addition to the age dependency burden of the population, the large numbers of females not in the labour force increases the overall dependency burden of the population.

In addition to the current levels of young dependency in the population, past trends in fertility and mortality have also created a population momentum

effect with increasing numbers of population in the youngest age groups although as a proportion of the total population there has been a decline in these age groups. These effects are expected to move through the population passing through the various stages of the life cycle from schooling to employment to family formation, retirement and old age.

The age specific sex ratios have improved significantly in the recent decades. Improvements in the socio-economic conditions and the increasing survival chances of women in the childbearing ages may be responsible for the noticeable changes in the sex composition of the population.

Chapter 9: Population Dynamics and Future Trends

The preceding chapters presented the levels, trends, and differentials of the components of population change - fertility, mortality and migration - and their related factors such as, family formation and the levels of health and nutrition. Chapter 8 presented an analysis of how these variables have affected the current age sex structure of the population.

The present chapter looks at the dynamics of these changes in the population growth at the present and in the medium term future. The first part of this chapter will discuss the effects of changing fertility and mortality on population growth, and propose a set of projections of the population at the national level. This will be followed by a discussion of the broad implications of these projections for the labour force growth and the growth in the school age population. The implications of the projected growth in these important cohorts of the population in terms of the available indigenous workforce and demand for schooling will be discussed in the following chapter.

9.1 Effects of Changing Fertility and Mortality on Population Growth

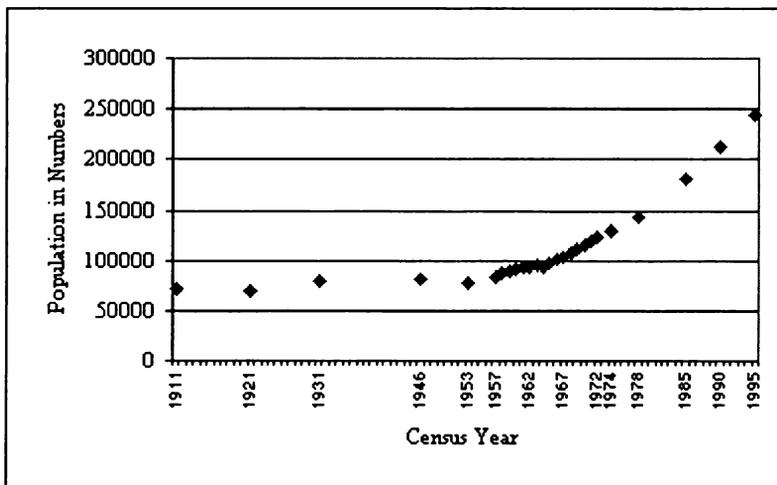
The last two decades of the 20th century saw significant shifts in the levels of mortality and fertility in the Maldives. As we have witnessed from the analyses of the levels and trends of fertility and mortality in the Maldives during the past twenty years, in Chapters 5 and 6, mortality levels have begun to decline rapidly since the latter part of the 70s, while fertility levels remained more or less stable at extremely high levels until it started declining during 1985 to 1995. The result was that the country saw the most rapid growth rates of its population ever recorded.

Records of the size of the population of Maldives have existed only from the early part of the 20th Century. Figure 9-1 and Figure 9-2 show the growth of population and its rate of growth in the Maldives between various censuses since 1911. It can be seen that there were three noticeable periods of population decline. The periods of decline were 1911 to 1921, 1946 to 1953,

and slight fluctuations during 1961 to 1964. Very little is known about the events that could have affected these population declines in the past. However, some explanation may be provided from two important events that roughly coincided with these trends. While it is difficult to provide an explanation for the first dip in the growth trend, the second dip may be explained by a major famine that occurred during the period 1946 to 1950, which claimed a large number of lives, especially in the rural atolls. The third dip may be associated with an influenza epidemic that swept the country during 1959 and 1960, which also claimed several lives (National Planning Agency, 1981:148). The actual extent of mortality caused by these two events is not known as no data or literature is available on the number of deaths for those periods.

In addition to these factors, the effects of under-enumeration cannot be ruled out, considering the transport and communication conditions that existed in the country in the past. The only form of travel between Male' and the islands during those days were by small sailboats and inter-island telecommunication was non-existent.

Figure 9-1: Population of Maldives, 1911 to 1995



Source: Prepared by the author from various census reports

From the limited information on the historical patterns of mortality in the Maldives and on the basis of author's personal knowledge that there has been no conscious efforts by the government, nor were there any cultural factors that were conducive to the control fertility of Maldivian women, it can be

concluded that the slow pace of population growth in the Maldives prior to the 1960s was facilitated largely by Malthusian checks and balances. As discussed in Chapters 5 and 6, with the introduction of modern medical care capable of dealing with such endemics as malaria, and epidemics such as influenza, death rates declined sharply, while fertility remained at its historical levels.

The effects of fertility decline, even if it has already commenced during the past five years or so, would not be felt for some time to come in the future growth of the population, since mortality declines has started considerably earlier. The gap between fertility decline and mortality decline presents itself in the 'younging' of the population. Increases in the young dependency ratio (see Chapter 8) provide some clues about the rising burden for the society in terms of providing various socio-economic services demanded by this growing section of the population.

The past trends in mortality and continuing high levels of fertility mean that the young dependency burden will continue to weigh heavily on the society for years to come. As Pool (1994:80) puts it, "A decline in fertility simply reduces the growth rate. But it then sets in train a form of 'population peristalsis' " which is the wave-like effect on the age structure as disordered cohorts pass through the various life-cycle stages from birth to old age. In this respect, an equitable distribution of quality services is absolutely necessary in order to equip the population that is currently in the dependent ages, to take up their roles as responsible and productive providers for their dependents in the future. As the nation progresses, both economically and socially, the types of skills that are needed in the future will become more sophisticated. This would mean that substantial investments must be made to develop a well nourished, adequately skilled, and highly motivated workforce.

The immediate problems for the society are in the provision of basic health care and education. With modernisation, the range of services demanded in the areas of health and education increases and the cost of providing such services also increase. Society is faced with the daunting task of not just merely maintaining a certain standard in the services provided, but also of finding

ways of improving the quality, and more urgently, the quantity of these services.

9.2 Population Projections – National Level

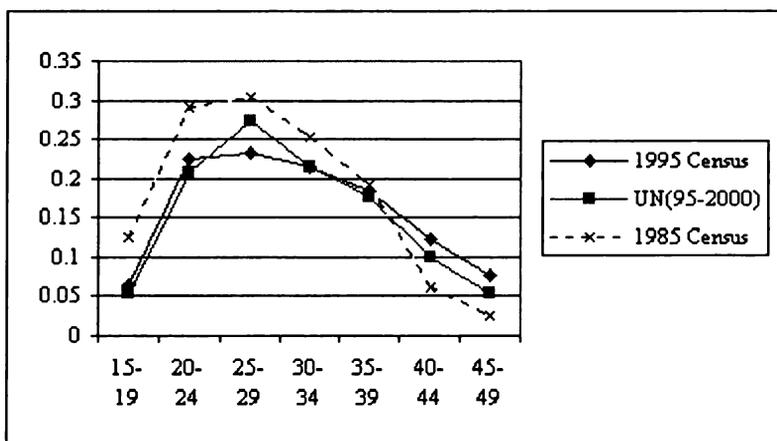
Projections of the population of Maldives were prepared by the author under three different variants of fertility. The assumptions of fertility, mortality and migration that underlie the projections, and the methodology adopted in computing them are discussed below.

9.2.1 Assumptions for Projection Variables

9.2.1.1 Fertility Assumptions

The pattern of age specific fertility used in the United Nations projections - Revision 98 (United Nations, 1998) differs significantly from the age specific patterns of fertility observed from the censuses of 1985 and 1995. As Figure 9-1 portrays, the observed age patterns of fertility indicate a more spread out age pattern of childbearing than that was predicted by the United Nations (1998). It is most likely that the United Nations assumptions were based on the fertility pattern observed from the 1985 Census. With the availability of more recent data from the 1995 Census, the assumptions of fertility need to be adjusted.

Figure 9-2: Age Specific Pattern of Fertility by Different Sources, Maldives

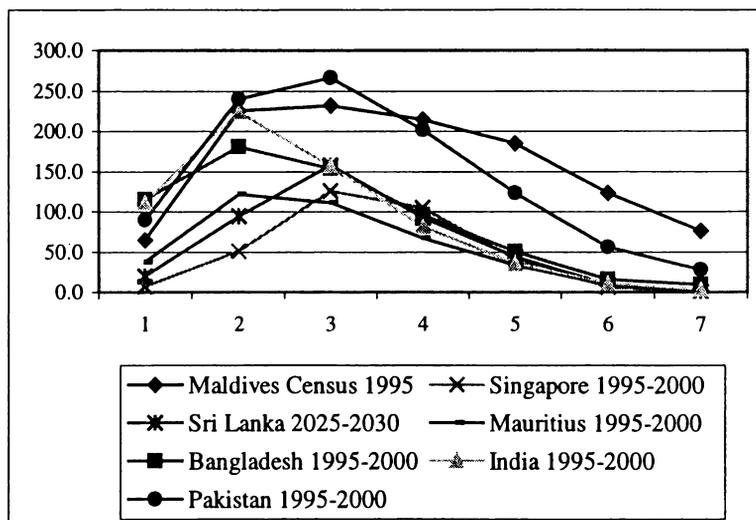


Sources: 1985 and 1995 censuses of the Maldives; United Nations (1998)

In order not to deviate much from the United Nations projections, the trend in the Total Fertility Rates assumed by the United Nations medium variant will be observed closely by assuming a linear decline in the TFR up to the year 2030, when it is assumed to reach 1.91 (the TFR for Mauritius for the period 1995-2000). However, appropriate adjustments will be made in the age pattern of fertility to match the fertility pattern observed in the Census of Maldives in 1995.

The age patterns of fertility assumed in the United Nations projections for the Maldives from the year 2025 onwards seem to differ significantly from the pattern of fertility that exists today. In fact, the United Nations assumptions for the age pattern of fertility of the Maldives by the year 2025 closely resemble the age pattern of fertility of Sri Lanka at present (Figure 9-3).

Figure 9-3: Fertility Patterns Projected by the United Nations for the Period 1995-2000, Selected Countries, Compared with the Age Pattern of Fertility for the Maldives from the Census of 1995



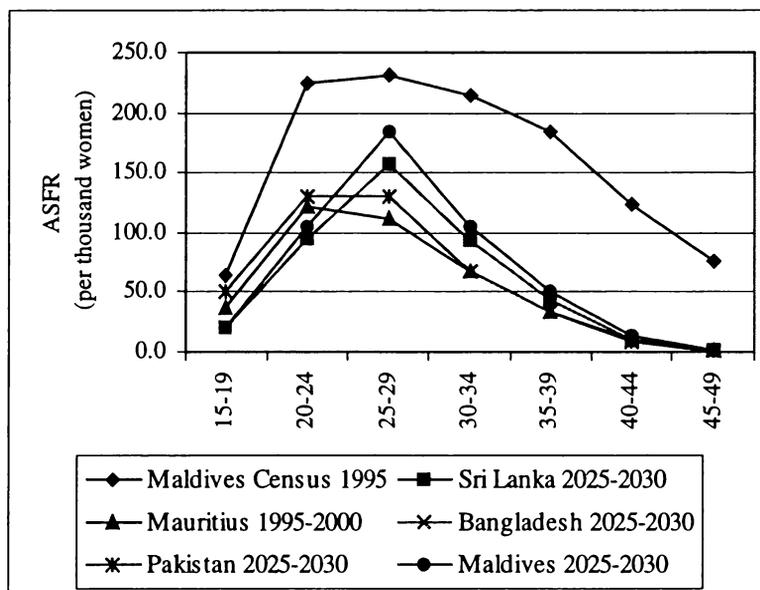
Source: United Nations (1998); Census of Maldives, 1995

Although one would expect the fertility pattern of the Maldivian population to resemble the patterns of fertility observed in the neighbouring nations of South Asia, based on the present age pattern of fertility of the Maldives, it is assumed that the age structure of fertility of Maldivian women will evolve towards one that approaches that of the present day Mauritius. Some important

characteristics of the population of Maldives provide support to this assumption.

The population spatial characteristics of the Maldives have more similarities with Mauritius than with any of the nations of South Asia. Although Mauritius comprises one main island on which most of its population resides whereas the Maldives consists of 1200 tiny islands across which its population is widely scattered, the absolute limits of land area in both countries provide tangible evidence of the effects of population growth on the lives of people. The micro scale in which the growing population affects the natural and the physical environment makes it virtually impossible for any person to remain unaware of such effects. In fact, the stages that Mauritius went through in the face of rapid population growth during the 1950s and the 1960s (Llewellyn-Jones, 1974) are being confronted in the Maldives today and political commitment has been given at the highest level of the government to deal with the problems of population growth in the Maldives (Presidential Address on World Population Day, 1999).

Figure 9-4: Fertility Patterns by the United Nations Medium Variant for Selected Countries and Periods



Source: United Nations (1998); Census of Maldives, 1995; Maldives 2025-2030 assumed by the author

Among the nations of South Asia, the other two nations with large Muslim populations, Bangladesh and Pakistan, both have age patterns of fertility that are different from the other populations of the region and more similar to the Maldivian pattern. The fertility patterns projected by the United Nations for these two countries for the period 2025 to 2030 onwards are very similar to the age patterns of fertility of Mauritius today. For these reasons, the age pattern of fertility of the Maldives used for the present projections will be based on the assumption that, by the year 2025, the age structure of fertility of Maldivian women will resemble the age structure of fertility of Mauritius today.

As discussed in Chapter 5 of this thesis, the estimated TFR in the Maldives in 1994 was 5.6. The United Nations medium variant projections assumed that during the period 1995 to 2000 the TFR in the Maldives would be 5.4. The present projections assume that according to the medium variant the TFR would be 5.5 during the same period. Table 9-1 shows the TFRs by different variants for the projection periods 1995-2000 to 2045-2050 for the Maldives.

Table 9-1: Assumed TFRs by Different Variants, Maldives 1995-2050

Projection period	Medium	High	Low
1995-2000	5.50	5.56	5.40
2000-2005	4.70	4.90	4.53
2005-2010	4.00	4.35	3.75
2010-2015	3.40	3.86	3.10
2015-2020	2.84	3.43	2.49
2020-2025	2.33	3.02	1.93
2025-2030	2.00	2.75	1.60
2030-2035	1.91	2.60	1.60
2035-2040	1.91	2.60	1.60
2040-2045	1.91	2.60	1.60
2045-2050	1.91	2.60	1.60

The levels of TFR at the end part of the projection period are assumed to be the same as those for the United Nations Projections (United Nations, 1998), except for the medium variant. As mentioned earlier, the level of TFR for the medium variant from 2030 onwards will be fixed at 1.91.

9.2.1.2 Mortality Assumptions

Life tables computed using age specific death rates from registration data have shown that in the recent years the sex differentials in the expectation of life at birth has shifted in favour of females in the Maldives. This is a major demographic achievement in the Maldives, as it changes a national pattern contrary to the well-known superiority of women in terms of life expectancy in many populations of the world. Women of Maldives have experienced shorter life expectancies than men in the past.

Table 9-2: Expectation of Life at Birth from Registered Deaths and Coale-Demeny Model Life Tables West Model, 1989-1998, Maldives

Year	Both Sexes	Male	Female	Difference
1989	61.29	-	-	-
1990	-	66.01	64.13	1.88
1991	68.80	66.18	65.20	0.98
1992	66.95	67.15	66.60	0.55
1994	69.12	68.90	69.33	-0.43
1995	70.60	69.87	71.60	-1.73
1997	69.62	69.20	70.15	-0.95
1998	70.12	70.59	71.82	-1.23

Source: Statistical Yearbooks of Maldives, various years.

The mortality trends applied in projecting the population in this thesis will assume that for the beginning period of the projections, namely, 1995 to 2000, the life expectancies estimated from the 1995 census by indirect methods will hold true. See Table 9-2 for estimated trends in life expectancy during the 10-year period 1989 to 1998.

Table 9-3: Expectation of Life at Birth for Selected Countries in the Asia Pacific Region, 1998

Country	Males	Females	Difference
Japan	77	83	6
Singapore	75	80	5
Malaysia	70	74	4
Sri Lanka	71	76	5
Australia	75	81	6
New Zealand	75	80	5

Source: Population and Development Indicators for Asia and the Pacific, 1998, ESCAP, Wall Chart

Life expectancies for some selected countries in the Asia Pacific region are given in Table 9-3. Apart from Sri Lanka, and Malaysia, all are developed countries. Sri Lanka can be said to be a demographically developed country

since most of its demographic indicators compare reasonably well with those of many developed countries of the world. It can be seen from these figures that in the low mortality countries of the world today, the difference between female and male life expectancies are between five and six years.

Table 9-4: Mortality Assumptions for the Projection Periods 1995 - 2050

Projection Period	Male life expectancy at birth	Female life expectancy at birth
1995-2000	63.00	66.00
2000-2005	64.79	67.94
2005-2010	66.54	69.77
2010-2015	68.20	71.70
2015-2020	69.95	73.60
2020-2025	71.53	75.40
2025-2030	72.84	76.80
2030-2035	73.71	77.70
2035-2040	74.50	78.60
2040-2045	74.80	79.31
2045-2050	75.00	80.00

Considering the levels of life expectancy for the population of Maldives at the present time, it would not be unrealistic to assume that by the year 2050, the life expectancies of the males and females will be similar to the levels enjoyed by countries such as Singapore, Australia and New Zealand. In fact, past trends in mortality decline and the recent developments in the socio-economic indicators of the country indicate that such levels could be reached much earlier than 2050. However, for the purposes of the present projections it will be assumed that the expectation of life for females and males during the final period of the projections will be 80 and 75 years, respectively (see Table 9-4).

9.2.1.3 Migration Assumptions

As has been discussed earlier, international migration of Maldivians has been virtually non-existent in the Maldives up to now. There is no indication that this situation will change in the foreseeable future, in a way that would affect the population of the country.

The United Nations projections (United Nations, 1998) have assumed that net migration in the Maldives will be zero for the entire period of the projections.

The present projections also assume that net migration will be zero throughout the projection period.

Although it would be desirable to project the numbers of expatriates in the Maldives in the future, it is not possible to do so due to the lack of sufficient information on this significant part of the population. The numbers of expatriates, in addition to demographic factors, would be very much dependent on several other factors such as the ability of Maldivians to replace expatriates in skilled occupations and the policies of the government on the extent of the expansion of tourism in the country.

9.2.2 Base Population

The base population for the population projections is obtained from the 1995 Population and Housing Census of Maldives. As seen in Chapter 4, the age distribution of the census population of 1995 is subject to some amount of age reporting errors. The indices of age preference and avoidance (Chapter 4) suggest that digit preference is not high in the Maldives. In spite of such moderate indices of digit preference, the high joint accuracy index of age ratios and sex ratios calls for some smoothing of the age sex structure of population from the 1995 census before it can be used as a base population for projecting the population into the future.

Several techniques have been developed for the purpose of smoothing the age sex structure of a population. In view of the relatively low levels of digit preference, these smoothing techniques will be applied in order to arrive at an age sex structure that retains its original curve.

There are two approaches to smoothing an age distribution of a population. One approach involves techniques that accept the population in each 10-year age group and separate it into two 5-year age groups without modifying the total population size. The other approach involves techniques, which smooth the 5-year age groups and modify, slightly, the population being smoothed (see Arriaga, 1994, for a discussion of the various methods available for smoothing a reported age distribution).

Various methods are available for the smoothing of age distributions from census such as, Carrier-Farrag and Karup-King-Newton formulas (Carrier and Farrag, 1959), the Arriaga (1968) formula, and United Nations method (1955 and 1956, cited from Carrier and Farrag, 1959). The choice of method depends on the extent of distortions in the reported age distribution. Considering that the extent of digit preference is only moderate and that there has been a decline in fertility in the recent years, the most appropriate method of smoothing for the population of the 1995 census of the Maldives appears to be the United Nations method. This method smoothes only the population in the age groups 10 and 69. Populations in the age groups below 10 and above 69 are not modified by this method of smoothing.

The use of this method of smoothing and the acceptance of the reported populations in the age groups below 10 and above 69 years of age could lead to some distortions in the projected population when the component method of projection is used. This may arise especially if the numbers of births computed from projected age pattern of fertility yield estimates of births higher than the population aged under five in the smoothed base population, especially when the projected population is split into single year age groups. However, using a very strong smoothing technique which totally alters the reported age pattern of the population would provide an age structure that exhibits a smooth curve, and also carries the risk of loss of genuine fluctuations in the age structure of the population.

The decision to use a method of smoothing which does not inflate the reported population in the age group 0 to 4 is justified by the observation of actually declining numbers of births in the population from registration data in the five years prior to the census. This pattern has been observed in other similar small island populations (see Pool, 1982:326).

The sum of all live births that occurred in the Maldives from 1990 to 1994 was 40,330. The under-five mortality rate as expressed by the proportion surviving from birth to age five (${}_0q_5$) obtained from the indirect estimation method for the Maldives for 1992 was 0.122. Assuming that this rate will be the average for

the period 1990 to 1994, the number of survivors of these births by the time of the 1995 census will not be more than 35,450. The population in the age group 0 to 4 in the smoothed population was 37,055.

Population figures from the 1995 Population and Housing Census of Maldives refer to 25 March 1995. In order to use these figures as the base populations for the projections, they will be adjusted to represent the mid-year population in 1995. The adjustment is made using the software package, PEOPLE (Overseas Development Administration and Economic Planning Unit, 1993).

PEOPLE projects the population by using the cohort component method of projection (Overseas Development Administration and Economic Planning Unit, 1993). The component method of projection follows each cohort of people of the same age throughout its lifetime according to exposure to mortality, fertility, and migration.

Starting with a base population by age group and sex, the population in each age group is exposed to the risk of dying as determined by the underlying mortality assumptions and age patterns of mortality from the selected life tables. The estimated deaths are subtracted from the surviving population and those remaining alive progresses into the next age group. Fertility rates are projected and applied to the female population in the childbearing ages to estimate the number of births in a year. These births are subjected to the risk of age specific mortality as they progress through the age structure every year. The next step is to take account of migrants by adding immigrants and subtracting emigrants by age group. This procedure is repeated for each year of the projection period to arrive at the population at a desired date in the future (Arriaga, 1994).

9.2.3 Methodology and Projections

9.2.3.1 Projection Methodology

The method of projection used to project the population of Maldives by three different variants – high variant; medium variant; and low variant under a single set of assumptions of mortality decline and three different set of

assumptions of fertility decline, is the well known demographic cohort component method. Since this is the conventional method of population projection we will not discuss the details of this methodology here. For a detailed discussion of the methodology refer to Shryock *et al.* (1976:456-461).

Once projections by five-year age groups for five-year periods are obtained, single year age data can be obtained for single calendar years by using Sprague multipliers and exponential interpolation (Sprague, 1880, quoted in Overseas Development Administration and Economic Planning Unit, 1993). Although this approach is generally satisfactory it may sometime yield inconsistencies in the progressions of cohorts through time (Overseas Development Fund and Economic Planning Unit, 1993).

9.2.3.2 Projections

The smoothed population from the 1995 census was adjusted to represent the mid-year population in 1995 to use as the base population for the population projections computed. The software package PEOPLE, Version 3, 1993 (Overseas Development Fund and Economic Planning Unit, 1993) was used to derive the projections under assumptions of mortality decline and the three assumed variants of fertility decline discussed above. The resulting scenarios from the three sets of projections are discussed below.

Of the three variants, the medium variant projections are taken as the most likely path of population growth in the Maldives during the medium term. The fertility assumptions under the medium variant are made on the basis of recent and past trends in fertility and contraceptive use in general. The trends in socio-economic development in the Maldives in the past two decades and the evident relationships between educational attainment and fertility, the growth of educational opportunities and attainments throughout the country and the author's personal knowledge on the changing fertility levels in the country have also been taken into consideration in developing the medium variant. In doing this, the recent population projections of the United Nations (United Nations, 1998) have been taken as guidelines in setting the fertility rates

towards the end of the projection period. However, once again, the actual levels are determined by considering the above-mentioned factors.

According to the medium variant projections (Table 9-5), the population of Maldives is expected to be 286,600 by mid 2000. Even if fertility declines at a slower rate than expected, the population is expected to be only slightly higher than this, at 287,100, as shown by the high variant.

Table 9-5: Projected Population, Maldives, 2000 – 2050, (Different Variants)

Year	Medium Variant	High Variant	Low Variant
1995	246.6	246.6	246.6
2000	286.6	287.1	285.8
2005	329.3	331.9	326.7
2010	373.6	380.7	367.9
2015	416.8	430.6	406.5
2020	457.0	481.0	440.6
2025	493.1	531.1	468.7
2030	527.4	582.5	492.5
2035	560.7	634.5	516.4
2040	592.7	688.6	538.1
2045	621.4	743.2	555.8
2050	645.9	797.3	568.6

By the year 2020, the population of Maldives would reach 457,000 according to the medium variant and 481,000 according to the high variant. However, if fertility declines can be further accelerated, then the low variant projections, which indicate a population of 440, 600 may become more applicable by that year.

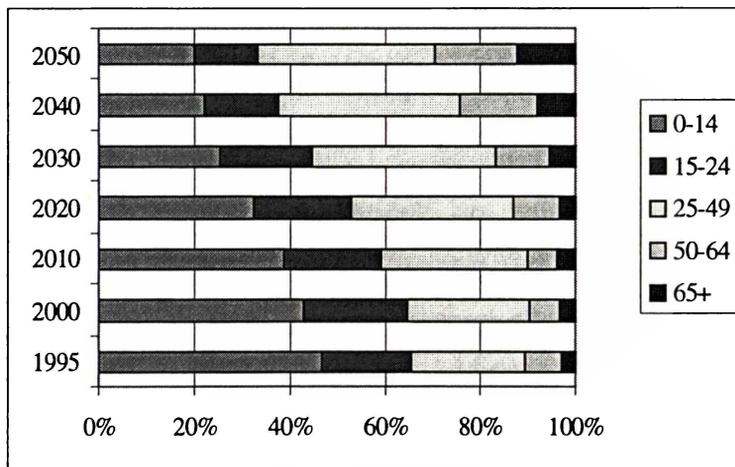
While these figures may appear to be small, with even in the case of the high variant projections the population merely crossing the half million mark, the direct implications of this for the limited land area and the natural resources of the country are likely to be ominous. It is not only the absolute size of the population that would cause concern for the sustainability of growth but, also the changes in the age structure of the population. Regardless of which projections one takes the population of the Maldives will roughly double by 2030.

There are other major problems that show up in these projections (see Figure 9-5). According to the medium variant projections, as a result of fertility

decline, the working age population or the population aged 15 to 60 is expected to increase at a higher rate than the school age population. This can be seen as a positive change in the age structure of the population in the medium term, as it changes from a broadly based to a barrel shaped pyramid. Nevertheless, even this change will mean that in the longer term, the issue of population ageing is bound to create new problems for the socio-economic development of the country.

The shifting of a high proportion of the population from school ages to working ages will prove to be the most important development resource that the Maldives will have in the coming decades. However, in order to fully utilise this versatile resource to the full advantage, it is essential not only to sustain the current levels of investment in human resource development, but increased investment and innovative efforts will be needed in the short and medium terms.

Figure 9-5: Distribution of Projected Population by Broad Age Groups, Medium Variant, Maldives, 1995 - 2050



Allied to this is concern about the increasing numbers of expatriate workers in the country in all areas of the economy, most significantly in the areas of education, health and tourism. The growing proportion of the working age population needs to be adequately trained to take advantage of employment opportunities in these areas, for it is these areas that attract the skilled and therefore most highly paid expatriates in the country.

Due to the effects of high fertility in the recent past, the age structure of the population is expected to change significantly in the future (Table 9-6). As the large cohorts of current and recent births pass through the age structure, the initial effect will be felt on the insurmountable pressures on the schooling system. At present the country is going through this phase. As these cohorts progress in age, the pressures will gradually increase on the labour market and housing. However, as mentioned in Chapter 8, it is expected that these age structural effects of population growth will continue to produce 'population waves' (Keyfitz, 1968 cited in Pool, 2000) affecting the demands for social and economic infrastructure and the revenue base that feeds into such at varying levels at different points in time until many of these high fertility cohorts progress into the older ages sometime between 2030 and 2035.

Table 9-6: Projected Population of Maldives by Broad Age Groups Under Medium Variant Assumptions of Fertility Decline 1995 – 2050 (Numbers and Percent)

Broad age groups	Projection years						
	1995	2000	2010	2020	2030	2040	2050
Numbers							
0-14	114,704	123,477	144,798	148,606	134,939	130,414	129,170
15-24	46,370	61,114	76,859	93,104	100,293	91,546	86,053
25-49	60,271	74,159	114,333	156,820	203,584	227,656	238,379
50-64	17,673	17,937	24,124	42,381	59,520	95,533	115,242
65+	7,622	9,942	13,515	16,047	29,064	47,577	77,045
Total	246,640	286,629	373,629	456,958	527,400	592,726	645,889
Percentages							
0-14	46.5	43.1	38.8	32.5	25.6	22.0	20.0
15-24	18.8	21.3	20.6	20.4	19.0	15.4	13.3
25-49	24.4	25.9	30.6	34.3	38.6	38.4	36.9
50-64	7.2	6.3	6.5	9.3	11.3	16.1	17.8
65+	3.1	3.5	3.6	3.5	5.5	8.0	11.9
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

It should, however, be noted that although the proportions of the population in the schooling age groups are expected to shift towards the working ages, in absolute terms, the numbers in the schooling ages are likely to increase up to 2020 and begin to decline from then on. The numbers in the working ages 15 to 64 are expected to increase throughout the projection period although those in the younger working ages 15 to 24 are expected to increase up to year 2030

and start to decline from then on. The implications of these projections are discussed in Chapter 10.

Population ageing is not expected to be an issue of major national concern until towards the end of the projection period when the proportion of the population aged 60 and older is expected to reach 10 percent by 2035 according to medium variant projections. If fertility decline accelerates and the low variant projections hold true, it is expected that the proportion of population aged 60 years and over will increase by about three percentage points more than is expected by the medium variant by the year 2050.

The numbers of elderly in the population will require the establishment of appropriate health and social geriatric services by the year 2020 when there will already be a projected 26,900 persons aged 60 years and over in the country. Considering the current levels of nutrition and health care in the country, especially in the atolls, it is likely that many of these people will suffer from some form of age related disability and hence would require specialised care.

9.3 Population Projections: Sectoral Concerns

On the basis of the population projection discussed above, projections of the school age population and the working age population are made using techniques described in Shryock et al. (1976: 470-474). While the underlying assumptions; the methods adopted in making these projections; and brief results of the school age and working age projections are presented below, the detailed discussions of the implications of these projections will be presented in the following chapter.

9.3.1 School Age Population

Perhaps the most overwhelming effect of high fertility and rapid population growth in the recent past on the social and economic development of the nation in the near future will be the excessive growth in the school age population. At a time when there is increasing demand for higher levels of schooling

throughout the country, the problems of providing the basic infrastructure and resources necessary to maintain present levels of enrolment are already evident today. The most vivid example of the overloading of the existing system is the double shifting³⁷ of classrooms in most schools in the country.

Projections of the school age population provide some understanding about the numbers of children who will be receiving education at different levels of education in the future. Such projections and the projections of the working age population provide some ideas about the types and amounts of investments that will be required to achieve the longer-term objectives of development outlined in the National Development Plans. As well as telling us about the future numbers of persons who will be receiving schooling, education projections also provide information relating to the output of the education system, that is the numbers of persons leaving schools with different attainment levels. This type of information can be of value for making labour supply projections and for manpower planning.

While there are several methods that can be applied to project the school age population by different levels of schooling (Economic Planning Unit and Overseas Development Administration, 1992), the types of data required for most of these methods are not readily available. In addition to the difficulties in getting such data, educational progression rates, repetition rates and dropout rates are also extremely difficult to project into the future. Consequently the use of enrolment rates by specific grade is likely to distort the projected figures as the current age patterns of enrolment by grade, especially in the rural schools where enrolment ratios by grade are higher than parity (see Table 9-7) due to the overage pupils, mostly in the lower grades. Several assumptions were made on the trends in school enrolment at various levels of schooling by gender.

³⁷ In order to cope with the rapid growth in the numbers of school age population and the growth in demand for schooling in the recent years, the government has divided virtually all schools in the country to operate in two shifts – a morning shift and an afternoon shift. Some schools even conduct classes in more than two shifts.

Enrolment data from school records show that for both sexes and for all levels under grade 7, which is the final grade of primary school, enrolment ratios are greater than unity. This is because in some schools in Male' and in most schools in the atolls, many students are over-age for their respective grades. This would make it unrealistic to project growth in school enrolment rates on the basis of these figures.

Table 9-7: School Enrolment Ratios³⁸ by Grade of School and Sex, Maldives, 1996

Grade	Enrolment ratio		
	Male	Female	Total
Pre-school	0.42	0.44	0.43
1	1.21	1.21	1.21
2	1.24	1.25	1.25
3	1.24	1.18	1.21
4	1.27	1.24	1.26
5	1.45	1.43	1.44
6	1.43	1.50	1.47
7	1.00	1.13	1.06
8	0.63	0.66	0.65
9	0.40	0.38	0.39
10	0.24	0.24	0.24
11	0.04	0.03	0.04
12	0.04	0.01	0.03

Source: Statistical Yearbook of Maldives, 1997

Therefore, the methodology used in projecting the school age population by different levels of school is based on the rates of school enrolment by the respective age group at a given level of schooling. The basic input used in most age-based education projection models is age-specific enrolment rates.

The Population and Housing Census of Maldives 1995, collected data on those who were currently attending an educational institution, distinguishing those who were attending grade based institutions from those at technical and vocational training institutions. On the basis of these data, enrolment rates by age and sex are computed by the author, which are used as the enrolment rates at the beginning of the projection series in 1995. Table 9-8 shows the assumed enrolment rates by levels of schooling from 1995 to 2020.

³⁸ Number of students enrolled in a given grade as a proportion of the population in the age group corresponding to grade level.

Assumptions about the future trends in school enrolment at different levels were made on the basis of several factors. The Fifth National Development Plan, 1997-2000 (Ministry of Planning, Human Resources and Environment, 1998) targeted to attain 100 percent enrolment by 1999. This target was set on the basis of current school enrolment rates derived from school records, which include data on over-age students enrolled at a given level and exclude those who were six years old but were not yet enrolled in grade one. These figures being reported by the schools also carry a risk of over reporting as the number of teachers sponsored by the government depends on the number of students enrolled (Ministry of Education, 1999, unpublished sources). School enrolment rates for six to eight year olds from the census data indicate that this target is perhaps too ambitious. However, in view of very high levels of enrolment at ages nine to 12 in 1995, it is assumed that 100 percent enrolment for all primary and extended primary grades could be attained by 2002.

Table 9-8: School Enrolment Ratios, 1995 Census and Assumed Trends

Grade	Corresponding age	Males			Females		
		1995	2002	2020	1995	2002	2020
1	6	0.54	1.00	1.00	0.54	1.00	1.00
2	7	0.83	1.00	1.00	0.84	1.00	1.00
3	8	0.89	1.00	1.00	0.91	1.00	1.00
4	9	0.91	1.00	1.00	0.92	1.00	1.00
5	10	0.93	1.00	1.00	0.93	1.00	1.00
6	11	0.93	1.00	1.00	0.94	1.00	1.00
7	12	0.91	1.00	1.00	0.92	1.00	1.00
8	13	0.89	0.92	0.98	0.91	0.93	0.98
9	14	0.86	0.89	0.96	0.87	0.89	0.96
10	15	0.80	0.84	0.95	0.79	0.84	0.95
11	16	0.65	0.66	0.66	0.62	0.63	0.66
12	17	0.49	0.49	0.50	0.47	0.48	0.50

The Fifth National Development Plan does not set any targets for secondary and higher secondary levels. On the basis of enrolment rates by age for those in the secondary and higher secondary ages, it was assumed that 100 percent enrolment would not be reached at these levels. It can be seen that the higher the grade at these levels, the lower the enrolment rates are. It is assumed that these trends will continue with grade 12 enrolment rates for both sexes reaching 50 percent by 2020.

While recognising that there will be repeaters and dropouts, once the students pass through basic primary grades that guarantee automatic promotion, for

computational purposes it was also assumed that there would be 100 percent progression in all grades at the extended primary level after the year 2002. The progression rates at grades in the secondary and higher secondary levels are indicated in the declining enrolment rates at these levels from one grade to the other. However, it was also assumed that progression rates at the secondary and higher secondary levels will improve from their base year levels up to the year 2015. These calculations were made using the software programme WORKERS developed by the Economic Planning Unit - Malaysia, and Overseas Development Administration - United Kingdom (Economic Planning Unit and Overseas Development Administration, 1992).

Table 9-9: Projected Population by Current Level of Schooling, Maldives, 1995-2020

Year	Primary		Middle		Secondary		Advanced	
	Schooling	Not schooling						
1995	33545	7257	13912	1126	16409	2759	5820	4559
2000	35147	1853	16314	333	21369	2937	8384	6468
2005	43145	0	14058	0	19964	2291	9212	7047
2010	48044	0	18584	0	22851	1955	8319	6231
2015	50291	0	19408	0	26765	1655	10510	7739
2020	50337	0	20284	0	28857	1095	11288	8158

As mentioned earlier, the current enrolment rates give a distorted picture of the unmet demand for education at various grades, because of age incompatibilities that exist at all levels of education in the Maldives, especially, and to a much greater extent, in the atolls. These incompatibilities occurred due to the fact that modern school based education was introduced in the atolls only during the late 70s, and then also in selected locations, spreading out, gradually, to other inhabited islands of the country during the past two decades. As a result, some portions of the population in the atolls still lack access to such facilities. Most grades in such schools were filled with over age students. Even where such facilities existed, the quality of education available was often of poor quality due to non-availability of suitably qualified teachers and teaching aides, and repeaters were common (Ministry of Education, unpublished).

With the improvements in the quality and accessibility of education at the primary and extended primary levels throughout the country, it is expected that the problem of age-grade incompatibilities will gradually be solved in the years

ahead. This would mean that demand for schooling at a given grade level would equal the population in the corresponding age and that the targeted enrolment rates at a given level would be more easily matched with the corresponding proportion of the population in the corresponding age.

The projected school age populations indicate that in the year 2000 there will be 92,800 children aged between 6 and 17 years old in the Maldives. By the year 2010 this number is expected to increase to 106,000 and by the year 2020 to 120,000. This is an increase of about one and a half times the size in 1995. The social and economic implications of these projections for future schooling will be discussed in Chapter 10

9.3.2 Working Age Population

It has been shown that fertility of Maldivian women is beginning to fall. A fertility decline is occurring after a period of declining mortality and sustained high fertility, which together prompted the rapid population growth of recent years. As a consequence of rapid population growth in the past and projected declines in fertility in the future, the most significant longer-term implication is the growth in the proportion of population in the working ages in the future. Projections of the labour force are a useful planning tool to understand about the future supply of labour and how it is likely to change with time.

The future size and composition of the labour force in the Maldives is projected using the software package WORKERS (Economic Planning Unit and Overseas Development Fund, 1992). The base population used to project the labour force is the smoothed population of 1995 census, adjusted for mid-year 1995. Projections of the labour force are made up to the year 2025 under certain assumptions of change in the labour force participation rates, by age and sex. The basic input used for obtaining projections of the future numbers of persons in the labour force are age and sex specific labour force participation rates.

The projected growth in educational enrolment rates by level of education by males and females were taken into consideration when assumptions about the

future labour force participation rates were made. The pattern of age-specific labour force participation rates by sex in the future was based on the existing patterns of participation by the sexes. For females, the future levels were assumed by examining the age-sex specific labour force participation levels in less developed and more developed populations with similar m-shaped curves, such as the Republic of Korea, Japan and the United Kingdom (Figures 3 and 5, Standing, 1978:16-18).

Table 9-10: Assumed Labour Force Participation Rates 2025

Age	Males		Females	
	1995	2025	1995	2025
15-19	0.32	0.32	0.14	0.14
20-24	0.81	0.81	0.33	0.45
25-29	0.90	0.90	0.32	0.40
30-34	0.92	0.92	0.30	0.34
35-39	0.93	0.93	0.32	0.40
40-44	0.92	0.92	0.35	0.43
45-49	0.91	0.91	0.38	0.45
50-54	0.88	0.88	0.35	0.42
55-59	0.83	0.83	0.34	0.37
60-64	0.73	0.64	0.29	0.22
65+	0.64	0.10	0.25	0.10

Assuming that there will be no growth in participation rates for males, as well as for females, in the age group 15 to 19 due to increased educational enrolment, male participation rates were assumed to remain at its base year levels for the age groups up to age 60, after which it was assumed to fall sharply. Participation rates for females were assumed to increase significantly in age groups between 20 and 60, after which it was assumed to decline. For both females and males the sharp falls in participation rates after the age of 60 were based on the expectation that with economic development and fertility decline, the types of economic activities and the levels of income during one's working life are expected to change and people are more likely to spend a number of years in retirement and still enjoy a satisfactory standard of living (see for example Standing, 1978).

Table 9-11: Projected Labour Force by Broad Age Group, Maldives, 1995-2025 (Numbers and Percent)

Broad Age Groups	Projection Years				
	1995	2000	2010	2020	2025
Numbers					
15-24	17,594	22,624	32,425	38,765	42,200
25-54	41,204	49,596	79,053	112,496	132,315
55+	10,242	11,042	11,509	16,464	17,692
All ages	69,040	83,262	122,987	167,724	192,207
Percentages					
15-24	25.5	27.2	26.4	23.1	22.0
25-54	59.7	59.6	64.3	67.1	68.8
55+	14.8	13.3	9.4	9.8	9.2
All ages	100.0	100.0	100.0	100.0	100.0

As indicated in Table 9-11, if the assumptions of the labour force participation hold true, there will be an estimated 192,000 Maldivians in the labour force by the year 2025. Most of this increase is expected to occur in the 25 to 54 year age group where it is expected that the percentage of labour force in this age group will increase from about 60 percent in 1995 to almost 70 percent in 2025.

Table 9-12: Change in Labour Force Between 1995-2025

Indicator	Both sexes	Males	Females
Total labour force	123,167	81,727	41,440
Median age (years)	2.18	1.55	3.96
Outside labour force	95,929	27,520	68,409
Annual average growth rate (%):			
All ages	3.41	3.22	3.89
Participation rates:			
Actual (percentage points)	2.43	-0.4	5.67
Due to:			
Age specific rate changes	0.38	-3.81	4.64
Age composition changes	2.04	3.41	1.03

It can be seen from Table 9-12 that the annual growth of the labour force is expected to average about 3.4 percent during the period 1995 to 2025 and the participation rates are expected to increase by 2.43 percentage points during this period. While some of this increase is caused by the assumed increase in the female labour force participation rates, most of this change will be caused by changes in the age composition of the population during this period. The

implications of these changes for the management of human capital will be discussed in Chapter 10.

9.4 Summary and Conclusions

Records of the population of Maldives dating back to the beginning of the 20th Century show that after periods of population decline and fluctuations, the rapid growth of population occurred during the last few decades of the century. The early fluctuations may be attributed to, apart from possible enumeration errors, the prevalence of high levels of mortality through epidemics and famine.

Mortality decline, which appears to have begun during the 60s, and the high levels of fertility that has prevailed until the late 80s, has resulted in a 'younging' of the population of the Maldives during the past two decades. This has increased the young dependency of the population, with implications for the social and economic development of the country. The swelling of numbers of the younger persons in the population pyramid would also have longer term effects, even if fertility declines that are being observed continues rapidly in the near future. The ripple effect caused as the large cohorts of currently young children, and their children after them, reach their childbearing ages, schooling ages, and entry to the labour force, will put the socio economic infrastructure through periods of strain. Society will not only have to maintain the existing standards, but improve their quality and quantity in order to cater to the growing demands.

Population projections prepared by the cohort component method, using the adjusted age distribution of the 1995 census, and under different assumptions of fertility and mortality suggest that, according to the medium variant, the population of Maldives would double by the year 2025. The high variant and the low variant projections are slightly more and slightly less, respectively, than the medium variant projection.

The projections also suggest that the age structure of the population of Maldives would change significantly in the future, if the assumptions of

fertility and mortality were not violated. The most positive change would be the increasing proportions of the working age population and corresponding decreases in the young dependent age population. At the same time, increasing proportions of elderly persons in the population would create new concerns in the future.

Most significant would be the increasing numbers in the respective age groups, namely; dependent school going ages, working ages, and the elderly. Although there will be significant shifts in the composition of the population in these broad age groups, for a resource scarce nation like the Maldives, the absolute numbers projected in these categories would mean high social and economic costs of catering to their needs. As a result, the issue of careful planning and sound investments in the development of human capital becomes important. We will now turn to an analysis of human capital in the Maldives.

Chapter 10: Human Capital

It is widely accepted at the highest levels of policy making in the country, that well planned investment in the development of human capital and formulation of strategies for their efficient management holds the promise for sustainable socio-economic development in the Maldives (see Chapter 2). At the dawn of the new millennium, Maldives is at crucial crossroads in its path of socio-economic development. Never before, in the history of the nation, has it been presented with such potentials. On the one hand, the opening of the country to international tourism has exposed its people to a cash economy that has created growing affluence and awareness. In order to benefit from the socio-economic development that is taking place in the country, education of their children is widely regarded as the most essential form of investment by the peoples from all walks of life. Demand for education has never been so high.

On the other hand, high fertility and declining mortality in the recent decades have produced high proportions at school ages. The challenges faced by the nation in making these two forces to converge in a smooth, coordinated manner are immense. Substantial investments in providing basic universal education and investment in developing the human capital to undertake these tasks are of equal significance.

The importance of the role of human capital for economic development has been recognised in economic-demographic research for some time (Becker, 1960, 1981; Romer, 1986; Lucas, 1988; Mankiw *et al.*, 1992; Willis, 1994; Gundlach, 1999). Benefits accruing from investing in human capital are not only economic. Investments in human capital are also seen as a valuable consumption good, and an important avenue for fertility reduction (Streeten, 1983). The link between human capital and population growth, and human capital and development are widely researched areas of the relationships between population and development. The interest in the research between these factors increased as the differences in the levels of economic development between the countries of South Asia, and East and South-East

Asia increased (see for example, Ogawa, Jones and Williamson, 1993; ESCAP, 1986).

This chapter looks at the development of human capital (as defined by education) and the labour force in the Maldives, tracing historical developments in the country up to the present. The broad trends and differentials in educational attainment and the changes in these differentials over time are reviewed. The levels, trends and differentials in labour force participation and changes over time are analysed. The shifts in occupational specialisations and types of skills among the Maldivian population are also studied. With the aid of the population projections, assessments are made of the emerging issues in the development and the management of human capital in the Maldives in the next two decades.

10.1 Education and Training

Probably from the days since the people of Maldives embraced Islam, during 1153 – 1154 A.D., basic religious education has prevailed in some form or the other among its various communities. Such religious education was provided from houses where children gathered to study the basics of the Arabic alphabet to enable them to read the Koran, and the Dhivehi language, as well as, basic numeracy (Hakluyt Society, 1994).

Table 10-1: Literacy Rates by Age and Sex for Population Aged 10 and Over, Maldives 1977, 1985 and 1995 Censuses

Age Groups	1977		1985		1995	
	Female	Male	Female	Male	Female	Male
10-14	73.5	68.5	94.2	91.3	97.4	96.7
15-24	86.9	83.7	94.8	93.9	92.7	93.1
25-49	79.4	81.6	85.9	89.0	94.1	93.0
50+	65.6	68.2	82.9	86.1	89.0	89.0

Source: Computed by the author from census data

The census of 1921 indicated that 53 percent of males and 45 percent of females were literate at that time. In some atolls, especially in the south of the country, the literacy rates were over 70 for both males, as well as females, even at that time. At present, Maldives enjoys one of the highest literacy rates in the region of South Asia and does not fall far behind the 'high literate' populations

of the world (see Table 10-1, see also Chaudhury, 1996) It can be seen that literacy levels have been improving in the recent decades. Particularly noticeable is the recent improvement in female literacy as seen in the female advantage in literacy in the younger age groups and the gradual closing of gaps in the older age groups with progressive censuses.

It should be noted that information on literacy in all censuses were based on a single question that asked the respondent if he or she could read and write with understanding. A survey of island women of the Maldives in 1979, which collected information on the literacy of rural women and men in the Maldives asked the respondents to read a section of a newspaper; the interviewer then decided which category the respondent belonged (National Planning Agency, 1980). The survey found that 61.7 percent of interviewed women and 89.2 percent of interviewed men were literate. However, among these a higher percentage of women were found to have 'very good' literacy levels compared to men (see National Planning Agency, 1980:36).

The survey report cautions that the high levels of literacy observed do not reflect an educated population; rather, it is the sole outcome of school attendance, as the levels of schooling were very basic. This situation has been changing in the Maldives during the years since the survey was conducted. In fact, the educational system in the Maldives has changed significantly throughout the latter half of this century. However, the changes that are most significant for the country's labour force, present and future, have occurred since the 1960s (Ministry of Education, unpublished data).

According to the 1921 census of the Maldives (Department of Census and Statistics, 1979), there were 839 Koranic schools and 18 navigation schools in the country. The navigation schools were probably the more advanced form of education available in the country then. Although it is unclear what was actually taught at these navigation schools, considering the skills of the locally certified navigators who had had similar education, it was probably mostly mathematical expertise that would enable one to navigate a ship with the aid of basic navigational equipment such as a sexton. Such education was not

widespread throughout the country and only a handful of people participated (Department of Census and Statistics, 1979).

The first government school in the country was established in Male' island in 1927. Initially restricted to the education of boys, its doors were later opened for young women and girls as well. Instruction was limited to Arabic, Dhivehi, arithmetic and Islam. This school later evolved into two schools, one for boys and the other for girls which continue to be the leading schools in the country even today (Ministry of Education, unpublished data).

Significant strides were taken in the development of education in the country under the President of the first Republic, during the 1940s and early 1950s. Under his encouragement and instruction every inhabited island in the country established some form of school, which provided education at the lower primary (*makthab*) level. Atoll level schools (*madhrasa*) were established offering a broader curriculum, taking students to a higher level of education than the island schools. These schools enrolled outstanding students from each atoll. At the national level education continued to be upgraded during the early 1950s and textbooks were printed in the *Dhivehi* language for the first time. Boarding houses were established in Male' island to accommodate outstanding island students who were awarded places in Male' schools³⁹.

With the fall of the first republic, the nation went back to a Sultanate form of government and the growth of education in the atolls virtually came to a halt. In some islands education actually underwent a decline (from qualitative data collected by the author in Mahibadhoo island, 1998 – see Appendix 2). The two government schools in Male' were transformed to English medium schools in 1960 (Ministry of Education, unpublished data).

The second Republic was established in 1968 (Ministry of Information, Arts and Culture, 2000) and with it the new government's initial focus was to stabilise the economy. However, during the 1970s, measures were taken to

³⁹ The boarding houses were short-lived and after their closure during the 60s no such attempt has been made to the author's knowledge.

revive education in the atolls. This change in policy eventually led to the establishment of Atoll Education Centres in each atoll and Atoll Primary Schools in all but one atoll.

The initial objectives of Atoll Education Centres were to provide a central role at the atoll level in providing administrative, dissemination, non-formal, and model school roles for the island schools within the respective atoll. However, the unforeseen high social demand for education has largely prevented the Atoll Education Centres from performing such a role and instead has struggled to meet the growing demand for education in the atolls

During the 1990s two secondary schools were established in two strategic locations in the atolls. These are located in the two islands that are being developed as the regional growth centres in the atolls, with modern telecommunication and socio-economic infrastructure being established to support the needs of the populations of the surrounding atolls.

Apart from the formal school system, there existed a system of vocational education that provided people, mainly with clerical, lithographic, calligraphic and administrative skills in order to prepare them for entry into the public sector employment. These training classes were operated, mostly privately in the form of tuition classes, but under a nationally standardised syllabus. At the end of the various stages of training a person can sit a national exam conducted by the government and on passing a given level, will be awarded a certificate. With the introduction of computers and word-processing software and equipment, and the modernisation of the workplace in general, and public sector administration in particular, the relevance of such training for competency in the workplace has been diminishing in the recent years. These types of training are giving way to training in computer literacy and modern office technology skills through training programmes conducted by private and public sector training centres.

The education and training machinery of the country is being continuously reviewed and improved. In the past most of these measures were remedial in

nature, taken to deal with a problem when it arises, rather than as preventive measures that are thought of in advance so that increasing demands for education and training are taken care of in good time.

Although university education is, up to now, non-existent in the Maldives, some form of tertiary training is provided through some four institutions: Institute of Teacher Education, Institute of Health Sciences, Institute of Islamic Studies, and Institute of Management and Administration. The Institute of Teacher Education mainly provides training for primary and middle school teachers who are both in service and pre-service, in the English and Dhivehi mediums. It has recently introduced secondary teacher training. The Institute of Health Sciences provides training for nurse aides, midwives, family health workers, pharmacy assistants and community health workers. It also conducts a two-year nursing Diploma course. The Institute for Management and Administration was established in 1991 with the objective of providing management training and consultancy services to the public and private sectors. It offers short courses on management and administration and a two-year course in accountancy, leading to a Diploma. The Institute of Islamic Studies, apart from providing secondary level education in Arabic and Islamic Studies in order to prepare candidates for entrance to Middle-Eastern universities, also offers Diploma courses and provides training in Islamic law.

Those seeking university education, however, have to travel overseas, either under a bilateral scholarship from a foreign government, a Maldivian government scholarship, or with private funding. With the growing numbers of students graduating at the secondary and higher secondary levels and the changing international aid environment, the opportunity for Maldivians to go overseas for university education is becoming extremely difficult and competitive.

The growing demand for tertiary education has prompted the government to seek alternative measures. One such measure is the establishment of a tertiary education institute incorporating the existing tertiary training institutes under

one umbrella body with the objective of developing it into a full-fledged university in the future (Government of Maldives, 1999)⁴⁰.

Apart from the tertiary institutions mentioned above, there are two vocational training centres, one providing training in areas such as engine repair and maintenance, electric workshop, woodcarving, construction, refrigeration and air conditioning and the other providing training in different vocations of the hospitality industry.

Information on educational attainment obtained from the census 1995 is used to compute various indices of educational attainment in the Maldives. This information is based on the question; what is the highest level of education completed? Census data on educational attainment is known to be affected by misreporting errors. Such errors can be caused due to intentional (such as reporting higher levels for prestige) or unintentional (such as inability by older persons to recall past events) or due to inadequate information on the person about which information is provided by the respondent (Shryock, 1976:185). The likelihood of such errors cannot be ruled out in the case of the data used for this analysis.

The effects of the spread of educational facilities in the atolls and the growing demand for education can be seen in the levels of educational attainment between urban and rural areas over time (Table 10-2). In 1985 a high proportion of persons in the age group 10 to 19 for both males and females reported high proportions in the no grade category. In fact, for the younger age groups there has been a significant shift in the proportions from no grade to the higher levels of schooling. While this is more evident in the urban areas, significant shifts can be observed even in the rural areas.

The increase in percentages in the no grade category in the age groups above 30 in the urban and in the age groups above 20 in the rural areas probably reflect the effects of selective out migration in the case of the rural areas.

40 Beginning in 2000, undergraduate degree courses have been introduced in some of these training institutes in collaboration with overseas universities.

However the existence of this pattern in the urban areas creates some doubt about the quality of reporting educational attainment by older persons. It can be assumed that the increase is due to improvements in enumeration in 1995, compared to 1985. Among those under 30 in the urban area and those under 20 in the rural area, the trend appears to be more credible. It can be seen that there has been a significant improvement in the educational levels of the population in these age groups, for both males and females.

Table 10-2: Percentage Distribution of Population in Age Group by Level of Educational Attainment, by Sex and Region, Maldives, 1985 and 1995 censuses

Level of education by sex	Region and age group							
	Urban				Rural			
	10-19	20-29	30-39	40+	10-19	20-29	30-39	40+
1985								
Females								
No grade completed	18.54	31.14	40.25	54.52	18.24	28.98	31.71	45.77
Primary	59.05	49.55	48.74	42.77	79.40	69.85	67.42	53.78
Middle	14.98	7.02	5.45	1.75	2.23	0.97	0.71	0.40
Secondary plus	7.43	12.30	5.56	0.96	0.13	0.20	0.15	0.04
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Males								
No grade completed	20.08	30.03	32.56	46.05	21.04	27.39	27.75	40.39
Primary	60.96	51.73	50.04	47.35	76.24	66.07	67.03	57.39
Middle	12.63	7.55	7.72	4.73	2.40	4.54	3.71	1.90
Secondary plus	6.33	10.69	9.68	1.86	0.32	2.01	1.52	0.33
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1995								
Females								
No grade completed	3.12	15.86	42.01	68.64	7.77	37.83	64.08	73.98
Primary	35.03	20.28	24.70	16.16	62.49	38.53	30.52	22.34
Middle	34.48	22.99	14.27	5.50	25.15	17.76	2.56	0.83
Secondary plus	26.27	38.60	14.80	4.06	3.76	3.75	0.56	0.21
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
Males								
No grade completed	2.84	16.20	37.80	60.13	7.00	33.02	57.65	69.93
Primary	37.44	20.20	23.12	18.94	66.97	33.84	29.59	24.37
Middle	35.45	24.02	15.01	6.15	21.22	21.26	6.30	1.95
Secondary plus	23.13	37.14	20.96	10.03	4.03	10.09	4.03	1.29
	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00

Source: Computed by the author from census data

Although females in the Maldives enjoy a higher literacy rate than males as we have seen earlier, Maldivian women seem to be disadvantaged at the higher

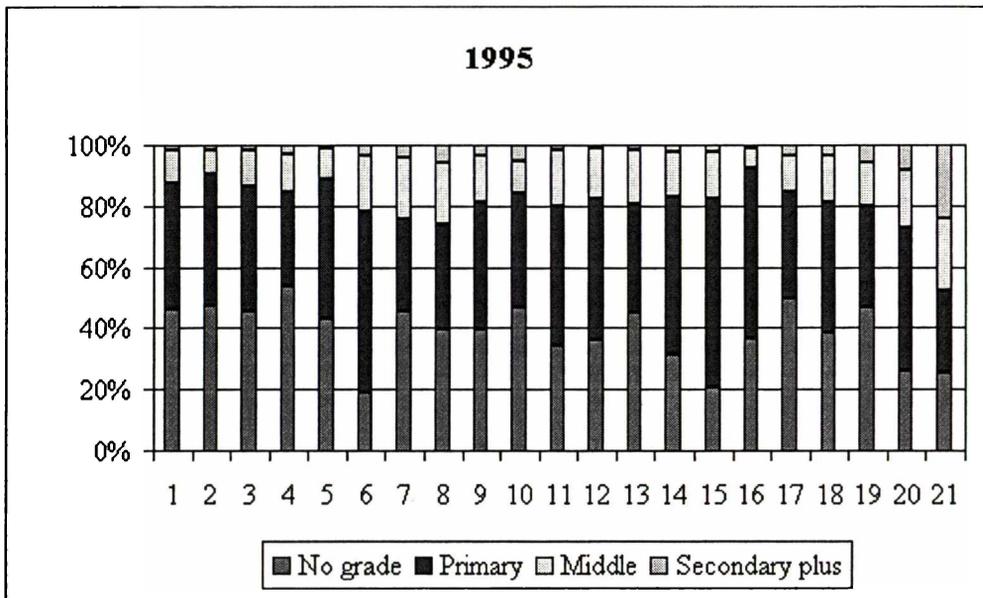
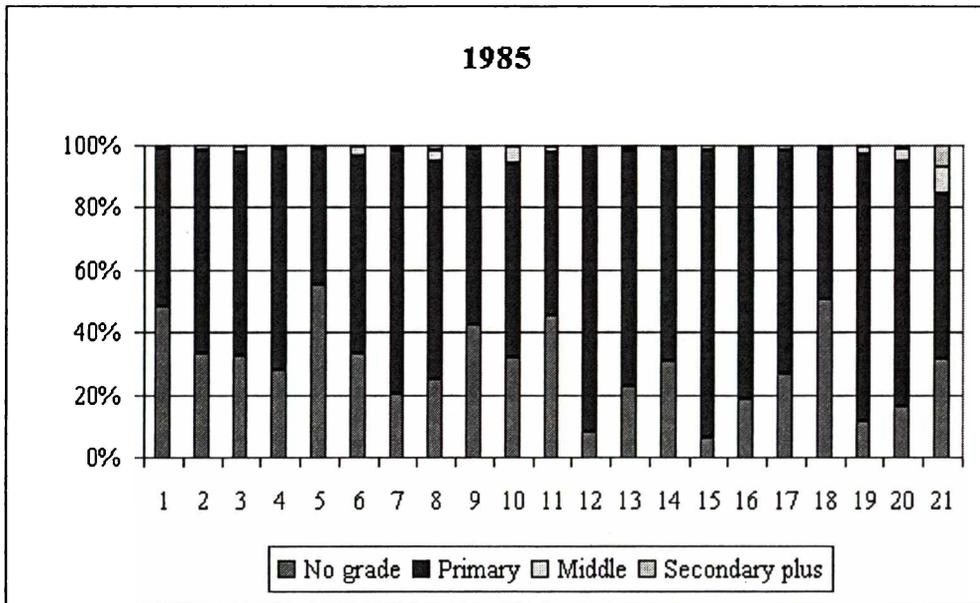
levels of attainment. There are higher proportions of women reported in the no grade category for almost all age groups, especially among the urban population in 1985. In 1995 this difference appears to be less obvious and the male-female gap seems to be disappearing at the schooling levels although, at the tertiary levels, proportions of women were still lower.

Figure 10-1 shows the development of education in the country during the ten-year period, 1985-1995. The top chart indicates educational attainment by level by administrative region (atoll) for 1985. The bottom chart indicates corresponding information for 1995. Each bar represents an administrative atoll except the last bar (bar number 21), which indicates Male' island. It can be seen that in 1985 and 1995, the distribution of educational attainment in Male' island differs considerably from the rest of the regions. Most of the difference is due to the growth in middle school and secondary school opportunities in Male' island, which has attracted school age population and also educated persons to Male' island. Currently, the most significant components of the schooling population in the Maldives are the pre-primary, primary and middle school populations.

While the government sponsors many of the primary teachers in the schools in the atolls, some island communities have managed to raise their own funds to sponsor expatriate teachers for their island schools (Qualitative data collected by the author in Mahibadhoo island, 1998). Such community initiatives in some islands may have played a significant role in more rapid improvement of educational attainment in some regions compared to others.

The importance attached to the human capital development by the public sector can be seen from the proportion of budget allocated for education. Total government expenditure increased during the period 1986 to 1996 by 449 percent, whereas expenditure on education increased during this period by 936 percent, the overall increase in the social services was 690 percent. Government expenditure on economic services increased only by 212 percent during this period (Statistical Yearbooks of Maldives 1996 and 1997).

Figure 10-1: Proportions of the Population Aged 10 Years and Over by Level of Educational Attainment and Atoll of Residence, Maldives, 1985 and 1995



Source: Prepared by the author from census data

At the pre-primary level in the atolls, school fees per child per month vary between Rufiyaa 10 and 25. In Male' fees average Rufiyaa 25 per month, additional costs for parents at this level being for the purchase of school

uniforms and materials such as books and pencils (Ministry of Education, Unpublished data). Data from the same source also indicate that in 1994, the government expenditure per pupil at the primary and middle school levels of education ranged from Rufiyaa 2,057 in Male' schools to Rufiyaa 1,161 in the atoll schools that are funded by the government. On the other hand, costs for parents also increase at these levels of schooling. It has been estimated that at the primary level parents spend about Rufiyaa 600 per child per year for uniforms, textbooks and supplies, while at the middle school level the cost of these items is about Rufiyaa 700 per child per year. In addition to these contributions, parents also provide additional support for their children's school by participating in fundraising and maintenance activities although this is more common to schools in the islands.

At the secondary and higher secondary levels it has been estimated that the government spent on average about Rufiyaa 6,500 per pupil in 1994. The cost for parents at these levels are around Rufiyaa 1,000 to 1,440 per pupil in private schools for fees, Rufiyaa 1,450 per pupil per year for textbooks and stationary, Rufiyaa 600 per pupil per year for uniforms and extra for tuition (Ministry of Education, Unpublished data).

Significant disparities exist between urban and rural areas in the pupil teacher ratios. In 1997 the pupil teacher ratio for the Maldives was 25.1 but in Male' it was 22 and in the atolls 26.5. There are considerable variations among the atolls. In some atolls the pupil teacher ratio was close to 40 while in other atolls it was a little over 20 (Statistical Yearbook of Maldives, 1998). These figures include only teachers provided by the government and does not include privately recruited teachers.

Of the 3,728 teachers on government payroll in 1997, 23.9 percent were temporary. The actual qualifications of these temporary teachers is not known but it is most likely that the Maldivians, who form about half of the temporary teacher population, are not formally trained. Among the teachers holding permanent positions, 67.6 percent were trained non-graduate teachers while 18.7 percent were trained graduates. Untrained graduate teachers comprised

another 3.8 percent and untrained non-graduates 9.9 percent (Statistical Yearbook of Maldives, 1998).

The current National Development Plan envisages to give particular attention to three criteria in the development and delivery of educational services, namely; affordability, sustainability and management capacity. The plan intends to allow the student teacher ratio in basic education classes to increase to 32 and to maintain a ratio of 25 to 30 in secondary level classes (Ministry of Planning, Human Resources and Environment, 1998). With the assistance of external donors, the government continues to construct new facilities and upgrade the existing facilities in Male' and the atolls in order to cope with the increasing demand for primary and secondary education and to achieve the objective of universal basic education by the year 2000.

The growth in demand for secondary education, especially in Male' island where it is overwhelming, is being catered for by transferring the extended primary levels (grades 6 and 7) from the existing secondary schools that include these grades, to additional primary school places created by the construction of new primary schools, thus increasing the capacity of existing secondary schools. The government also continues to support private secondary schools and encourage provision of secondary schooling in the atolls through existing Atoll Education Centres (Ministry of Planning, Human Resources and Environment, 1998).

Growth in demand for secondary education has necessitated the government to recruit large numbers of expatriate teachers to fill the gap. In 1996 almost 70 percent of secondary teachers in the country were expatriates. Training of sufficient numbers of primary and secondary teachers, but more crucially secondary teachers (human capital) required for the expanding educational facilities will be the greatest problem facing the country in the near future. With the inception of the secondary teacher-training programme at the Institute of Teacher Education, the government envisages to train adequate numbers of local teachers to cater to the secondary schooling demands by the year 2020 (Haveeru News Service, 1999). Achieving this goal would be an onerous task,

especially when the quality of teachers trained should not be compromised for quantity.

It would be interesting to analyse the characteristics of the schooling population at higher levels of education and vocational training. However, due to the small numbers at higher levels of education, especially in the rural areas, it was not possible to do such an analysis. This also makes it difficult to predict the population with such skills in the future.

10.2 Labour Force – Entry and Progression

Labour force status of a population is generally classified into three categories: employed, unemployed, and not economically active. The employed and unemployed, are together classified as the economically active population.

- a) **Employed:** all persons, including family workers, who worked during the reference period, for pay or for profit, or who had a job in which they had already worked but from which they were temporarily absent because of illness or injury, industrial dispute, vacation or other leave of absence, absence without leave, or temporary disorganisation of work due to such reasons as bad weather or mechanical breakdown.
- b) **Unemployed:** all persons who, during the reference period, were not working but who were seeking work for pay or for profit, including those who never worked before. Also included are persons who, during the reference period, were not seeking work because of temporary illness, because they made arrangements to start a new job subsequent to the reference period, or because they were on temporary or indefinite lay-off without pay.

The not economically active population comprises of those in the working ages and fall into one of the following categories:

- a) **Homemakers:** persons of either sex, not economically active, who are engaged in household duties in their own home; for example, housewives and other relatives responsible for the care of their

home, children and the elderly. (Domestic helpers working for pay are classified as economically active).

- b) Students: persons of either sex, not economically active, who attend any regular educational institution, public or private, for systematic instruction at any level of education.
- c) Income recipients: persons of either sex, not economically active, who receive income from property or other investment, royalties or pensions from former activities.
- d) Others: persons of either sex, not economically active, who are receiving public aid or private support, and all other persons not falling in any of the above categories, such as children not attending school. (Ministry of Planning, Human Resources and Environment, 1995, unpublished).

Maldivian women, similar to men, have demonstrated high levels of labour force participation in historical times. When the first census of the Maldives was conducted in 1911, 55 percent of the total population of 72,237 were reported to be employed in various occupations. The proportions employed were high for males, as well as for females, although males enjoyed a slightly higher rate of employment than females; 59 percent for males compared to 50 percent for females. In spite of a population decline between 1911 and 1921 (see Chapter 8) the absolute numbers and the proportions of employed population increased over 1911 levels. In 1921, 57.5 percent of the total population were employed. This was mostly due to an increase in the proportion of employed males from 59 percent in 1911 to 64 percent in 1921, while the proportion of employed females remained at 50 percent in 1921.

Although the size of the labour force increased during the period 1911 to 1921, declines were already clearly visible in many types of traditional occupations in 1921. Some important indigenous skills were beginning to disappear from the Maldivian labour force as early as the beginning of this century. Of special significance are the types of occupations that involved long term exposure to

master the skills, such as artistic mat weaving, handicraft lacquer work, net making, gold and silver smithing, and less skilled occupations such as toddy tapping. Probably some of those who were leaving these occupations moved to fishing and related activities, as the numbers of fishermen increased during the period 1911 to 1921 from 14,386 to 14,760.

Records from these early censuses do not provide any information on the age composition of the labour force. Although several censuses were conducted at different intervals during the years that followed, none of these provide detailed tabulations either. It is therefore, impossible to exclude the effects of changes that may have occurred in the age structure of the population during the 10-year period between 1911 and 1921. It is almost certain that certain changes would have occurred due to the effects of influenza and famine. However, it is also probable that the age group most affected would be the very young and the very old. In the absence of other evidence it is assumed that the impact of the two incidents on the working age population was minimal.

The census of 1977 was the first to provide such detailed tabulations on the labour force. Compared to the beginning of the century, labour force participation rates in the Maldives have declined significantly. The proportions of employed persons aged 10 years and over in the population in 1977 were, 72 percent of the males and 51 percent of the females. Employment data were collected for the population age 5 years and over in 1977. This information indicated that in 1977, the labour force participation of males aged 10 to 14 was almost 33 percent and that for females 20 percent. By 1985 these rates have declined to 8.6 and 3.2 and by 1995 to 1.6 and 0.9 percent for males and females, respectively (Table 10-3). These changes can be largely attributed to the improvements in the accessibility to schooling during this period in all parts of the country, including the urban area.

The most significant change in the employment patterns in the Maldives also occurred during the intercensal period 1977 to 1985. This was the decline in the labour force participation rates of both males and females, but more significantly for females, across all broad age groups. For those in the age

group 15 to 24, part of the decline may be attributed to growth in education, although this effect is likely to be restricted to those in the lower end of the age group. However, for those in the upper end of the age group and in the older age groups the decline in the labour force participation is likely to be caused by the changes that occurred in the fisheries sector and the removal of the Royal Air Force Base from Gan (as briefly mentioned in Chapter 2 and elaborated in Chapter 11). Due to the particular nature of these two areas of employment and the type of changes that occurred in the fisheries sector the effect of the former change is likely to be most heavily felt by the female labour force and the latter by the male labour force. The impact of the changes in the fisheries sector being more widespread than the impact of changes in employment opportunities in Gan, the magnitude of these changes on the labour force participation of women were also greater.

Table 10-3: Labour Force Participation Rates by Broad Age Groups and Sex for Census Years, 1977, 1985 and 1995, Maldives.

Broad Age Group	1977		1985		1995	
	Males	Females	Male	Female	Male	Female
10-14	32.7	19.9	8.6	3.2	1.6	0.9
15-24	84.5	56.3	69.7	21.7	53.3	22.4
25-49	96.2	68.8	88.8	25.9	90.8	32.3
50-64	92.9	62.3	80.3	26.6	80.7	32.8
65+	65.1	35.1	51.0	16.9	50.9	18.7
Total employed	37,311	22,772	40,310	11,116	48,879	18,060
Population 10 +	52,093	45,119	57,675	51,772	76,772	74,971
Percent employed	71.6	50.5	69.9	21.5	63.7	24.1

Source: Computed by the author from census data

By 1995 the labour force participation of both males and females have improved slightly across all age groups except for males in the age group 15 to 24. The continued decline in the male labour force participation in this age group can be explained by the growth in secondary educational opportunities. The increase in female labour force participation in this age group in 1995 is not likely to be caused by a bias in educational accessibility against females but female labour force participation in this age group being considerably lower than males, it merely suggests the improvements in the accessibility to

employment opportunities, probably of educated females in the modern sectors..

10.3 Employment and Unemployment

The data on employment collected in the Maldives' censuses of 1985 and 1995 can be used to compute the activity status of persons, using the above-mentioned definitions of labour force status. Employment and unemployment rates for the census years 1977, 1985 and 1995 are presented in Table 10-4.

Table 10-4: Employment* and Unemployment* by Sex and Region, Maldives, 1977, 1985 and 1995.

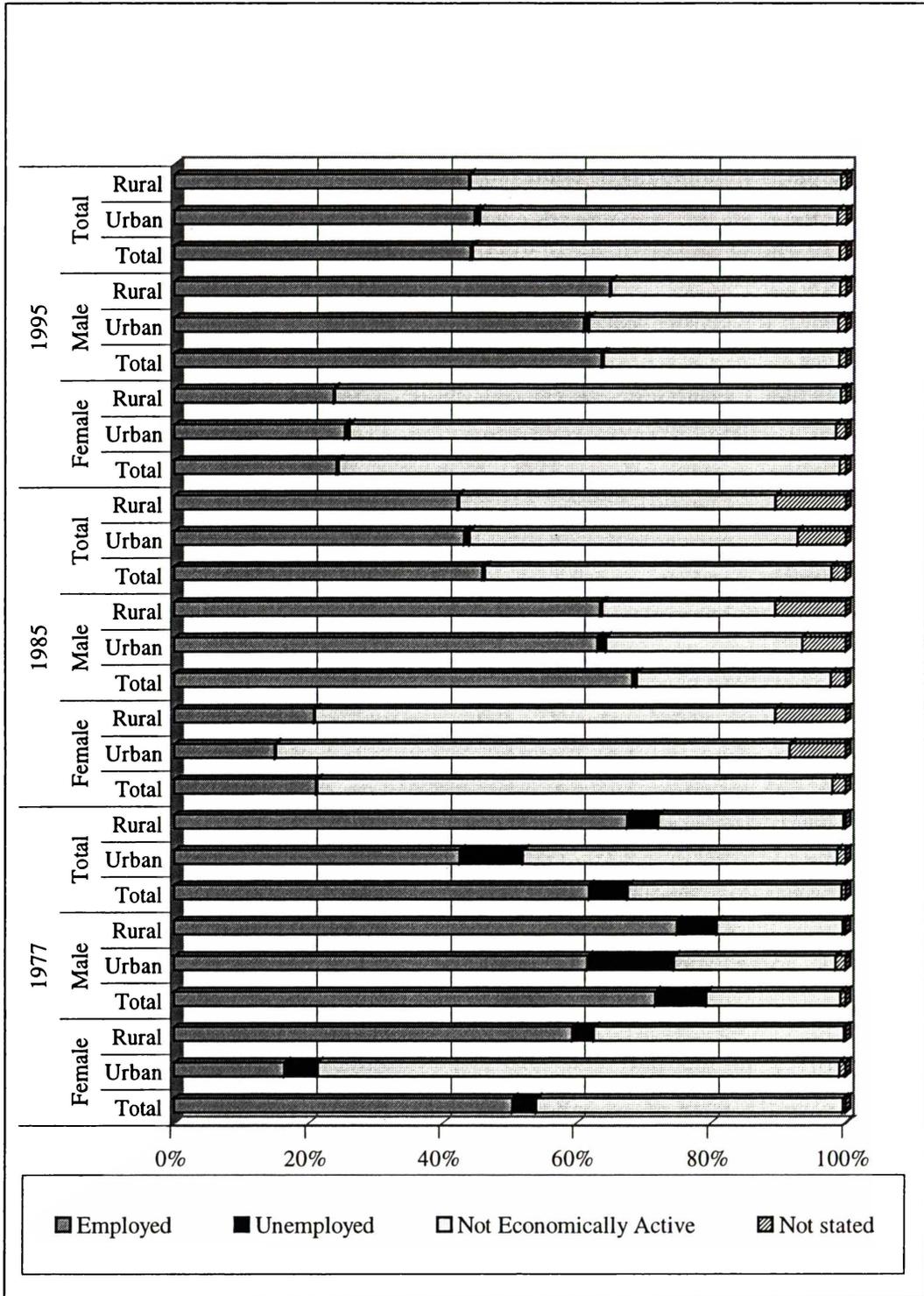
Region	1977		1985		1995	
	Males	Females	Males	Females	Males	Females
Total	100.0	100.0	100.0	100.0	100.0	100.0
Employment Rate	90.3	93.4	99.0	99.2	99.4	98.7
Unemployment Rate	9.7	6.6	1.0	0.8	0.6	1.3
Urban	100.0	100.0	100.0	100.0	100.0	100.0
Employment Rate	82.7	77.1	98.0	99.0	98.6	97.1
Unemployment Rate	17.3	22.9	2.0	1.0	1.4	2.9
Rural	100.0	100.0	100.0	100.0	100.0	100.0
Employment Rate	92.5	94.8	99.5	99.2	99.8	99.4
Unemployment Rate	7.5	5.2	0.5	0.8	0.2	0.6

* Rates expressed as a percentage of labour force aged 10+

Source: figures for 1977 obtained from National Planning Agency, 1981; figures for 1985 and 1995 computed by the author from census data.

While appreciating that there could be errors in the reporting of employment and unemployment in the census, it is assumed that reporting is likely to have improved in the past and any improvements in the reporting is likely to increase the rates of unemployment rather than decrease it. Table 10-4 shows that the unemployment rate has declined since its high levels in 1977. These trends seem credible since they compare with the economic changes that have take place in the country roughly coinciding with the period, 1977 to 1995 (see chapter 11).

Figure 10-2: Population Aged 10 Years and Over, by Activity Status, Region and Sex, Maldives, 1977, 1985 and 1995



Source: Computed by the author from census data

Unemployment dropped from 8.6 percent in 1977 to 0.94 percent by 1985, further declining to 0.79 percent by 1995. This overall drop in the rate of unemployment, however, appears to conceal a more unfavourable situation;

female unemployment appears to have increased slightly, both in the rural and the urban areas (more so in the urban area) between 1985 and 1995. This could be either the result of some improvements in the quality of reporting or the effect of a growth in female educational levels that have encouraged more females to look for employment. The differential trends in the levels of unemployment for males and females in the urban area are likely to be the effect of unequal access to modern sector employment for females, thus limiting their employment opportunities. The distribution of population aged 10 years and over according to region of enumeration, sex and census year by proportions in different economic activity categories are shown in Figure 10-2.

While the levels of unemployment were high in 1977, the levels of employment were also high. However, it can be seen that in 1985 the levels of employment have fallen and unemployment has also declined. The proportion of the working age population classified as not economically active increased. Particularly significant are levels of inactivity among the female population, both in the rural and the urban areas. Increased accessibility to schooling and lack of access to modern sector employment are the likely factors associated with this trend.

10.4 Occupations and Skills

Traditionally, Maldivians were known among the international trading posts of the region for the superior quality coir rope, cowry shells, lacquer ware, 'Maldivian fish', and hand made cloth and also their boat- building skills, (Hakluyt Society, 1994; Pyrard, 1619 and references therein). In fact, some of the early writers on the Maldives categorised the islands into two groups – the coir islands and the cowry islands (Department of Census and Statistics, 1979). Cowry shells and coir rope were exported in large quantities to the regional countries in exchange for rice and other goods.

Today, while most of these skills have largely disappeared, the production of Maldivian fish remains a major export oriented industry in the Maldives. The craft of boat building is also sustained although most of it is done at present in boat yards using modern technology. The main type of boat built in the

country has always been small fishing craft, which are locally known as 'dhoni', as fishing continues to be the livelihood of a substantial proportion of the Maldivian population (see Chapter 11).

Although none of the early censuses of 1911 and 1921 (Department of Census and Statistics, 1979) recorded females in any of the fisheries related occupation, the large numbers of women involved in fish processing recorded in the census of 1977 suggest that women have traditionally played a significant role in the home based processing of fish in the Maldives. Prior to the 1970s when the local fishing dhonis were powered by sail, the distances that one could travel in a given day were short and the chances of taking the catch fresh to a market were almost negligible. The only option was to take the daily catch back to the base island and process it at home before it can be taken to the markets in Male' for sale to exporters (Qualitative data collection by the author in Mahibadhoo, 1998). With the introduction of diesel engines to the existing fishing vessels under a government-co-ordinated programme, the traditional fishing fleet went through full mechanisation during the 1970s and the 1980s. This and several other developments in the fishing industry (see chapter 11) made women's involvement in the fishing industry redundant (National Development Plans, various years). However, with the developments in the fish processing and improvements in the marketability of raw fish, the families of fishermen were able to enjoy better incomes from fishing and women were not encouraged to look for alternative sources of employment, nor were there many such opportunities available in the islands.

Another reason for the diminishing numbers of women in the Maldivian labour force can be attributed to the environmental effects of over population. Deforestation of inhabited islands leading to the depletion of raw materials needed for the manufacture of traditional crafts such as coir rope, straw mats, baskets and thatch, have excluded a lot of women who were otherwise active in the production of such items, although these products are in high demand for the decoration of the tourist resorts.

Some attempts have been made to attract women into factory jobs by attracting foreign investors to set up garments factories in some atolls. However, Maldivians, not being used to the rigid and sometimes demanding routines of factory employment, have not been able to keep up to the expectations of the employers and thus have not benefited greatly from them. The investors had to look for expatriate labour to enable them to run their operations in the Maldives.

Table 10-5: Employed Population 15 Years of Age and Over by Occupational Categories and Sex, Maldives, 1977 (percent)

Males		Females	
Occupational category	Percent	Occupational category	Percent
Fishermen	51.98	Other production*	44.89
Crews and boats men	5.45	Fish processing workers	25.58
Farmers and farm labourers	4.40	Farmers and farm labourers	13.40
Labourers and craftsmen	4.13	Private service cooks and maids	2.68
Carpenters and wood workers	3.41	Other agricultural workers	2.50
Toddy tappers and related	3.09	Tailors and dressmakers	2.20
Brick layers and reinforced concreters	2.60	Secretaries, stenographers	1.15
Other production	2.59	Other service	1.10
Salesmen and related	2.17	Cowry and shell collectors	0.90
Other service	1.87	Medical technicians, public health..	0.86
Fish processing workers	1.18	Livestock dairy and poultry farmers	0.63
Watch men	1.16	Bakers	0.55
Secretaries, stenographers	1.09	Salesmen and related	0.55
Fishing boat owners	1.05	School teachers and administrators	0.42
Quarrymen	0.93	Labourers and craftsmen	0.38
Sales other	0.87	Toddy tappers and related	0.36
Mail clerks, messengers	0.78	Sales other	0.28
Policemen	0.70	Tobacco product makers	0.28
Private service cooks and maids	0.67	Fishing boat owners	0.21
Cooks waiters and related workers	0.63	Transport equipment operators	0.14
Other categories	9.87	Other categories	1.08

* Includes production of processed food, coir, cadjan and similar items.

Source: National Planning Agency, 1981

In 1977, the most important occupation for Maldivian men still remained fishing with 52 percent of employed males in this activity and fish processing was reported as the single most important activity for women with 25 percent of employed women engaged in this activity. For males and females agricultural activities were also important. Occupations in the transport sector were also important for men. The occupational category with the largest percentage of women reported was 'other production'. This category is likely to include all sorts of home based production, other than fish processing,

including sewing, coir rope making, thatch making, mat weaving, and others (Table 10-5).

The census of 1995 shows substantial changes in the occupational composition of the labour force from the 1977 situation, appropriately reflecting the changes in the country's economic structure in the past two decades⁴¹. In 1995, the employed population were in 345 occupational categories. Numbers of people in some of these unit level categories were small (table not shown). It would therefore be appropriate to look at a more aggregate level of classification (see Table 10-6).

Table 10-6: Employed Population 15 Years of Age and Over by Occupational Category, Region and Sex, Maldives, 1995 (Percentage Distribution)

Occupational category	Male		Female		Total	
	Urban	Rural	Urban	Rural	Urban	Rural
Legislators and senior officials	2.2	1.2	0.8	0.1	1.8	0.9
Managers	10.1	3.3	2.7	1.6	8.2	2.9
Professionals other than teachers	17.0	6.9	13.1	8.0	16.0	7.2
Teaching professionals	4.2	3.2	16.1	9.8	7.3	5.0
Clerks	7.2	3.3	27.0	3.4	12.3	3.3
Service workers	11.4	6.5	3.5	3.9	9.3	5.8
Market oriented skilled agr workers	0.3	3.2	0.3	10.9	0.3	5.3
Market oriented skilled fishery workers	3.5	33.0	0.0	1.1	2.6	24.3
Building and metal trades workers	11.2	15.3	0.3	0.4	8.4	11.2
Crafts and other trades	1.7	3.5	16.1	49.8	5.4	16.3
Stationary plant and machine operators	0.2	0.7	0.2	0.1	0.2	0.5
Drivers and mobile plant operators	8.8	6.6	0.2	0.1	6.6	4.8
Other occupational categories	22.2	13.4	19.7	10.6	21.6	12.6
All categories	100.0	100.0	100.0	100.0	100.0	100.0
Total numbers employed	11,433	25,574	4242	12,329	15,675	37,903

Source: Computed by the author from census data

Fisheries continued to be one of the most important sectors of the economy in terms of foreign exchange earnings, employing 33 percent of the employed rural males in 1995. Occupations in the tourism sector are distributed over a diverse range, from managers and administrators to service workers and

⁴¹ The occupational classification of the censuses of 1977 was based on the International Standard Classification of Occupations (ISCO) while the classifications of 1995 were based on the 1988 version of the classification (ISCO-88). ISCO-88 provides a coding structure for 390 different occupations (units) categorised in to 116 minor groups and 10 major groups.

transport workers to elementary occupations. In this context, service workers, managers, and drivers (which includes the transport sector), together account for close to 30 percent of all employed males in the urban area. Professionals other than teachers also appear to be an attractive area of employment for urban males, with 17 percent of all employed males in this category.

Females in both areas, but more so in the urban area, appear to find teaching, professional occupations other than teaching, and office work such as clerical occupations more attractive. However, the most important occupation for females in the rural areas is undoubtedly in the area of crafts making. The high proportion of females in craft and related workers category is due to their high involvement in handicrafts, garments production, tailoring and embroidery making. For reasons mentioned earlier, it is most likely that those who were engaged in garments production were self-employed persons working from their own homes and not those who were in factory employment. Table 10-7 provides some evidence to this effect.

Table 10-7: Population Employed in Crafts and Related Work by Status in Employment, Maldives 1995

Status in Employment	Male	Female	Total
Not Known	0.1	0.1	0.1
Employer	5.1	2.0	3.7
Employee	35.1	1.8	19.5
Own Account Worker (No Employees)	52.3	73.7	62.2
Unpaid Family Worker	4.3	18.9	11.1
Not Stated	3.2	3.6	3.4

Source: Computed by the author from census data

It can be seen that almost 74 percent of all women engaged in the production of crafts and related products were, in fact, self employed and working without any employees. A further 19 percent were classified as unpaid family workers. Although a significant proportion of males in this industrial category are employees working for pay, the majority of them are also self-employed. Significant proportions of rural women are also engaged in market-oriented agricultural production.

It is evident from the above information that while the men and women in the Maldives are involved in diverse types of occupations, there are certain types

of occupation that are gender specific. For instance, occupations in the transport, fishing, and construction sectors are more popular among men, while occupations such as teaching, nursing, midwives, and crafts making are more popular among women. In the qualitative interviews conducted by the author in selected islands of the Maldives during December 1998 to February 1999, several parents reported teaching as the most appropriate career choice for girls after they complete secondary school (see Appendix 2)

10.5 Human Capital Development and Management: Emerging Issues

10.5.1 Human Capital Development

Using the population projections discussed in Chapter 9, the resource implications of the projected growth in the school age population are estimated. These estimates are based on certain assumptions about the future levels of pupil/teacher ratios at different levels of schooling, the number of students per classroom at different levels of schooling, and the cost per year per student at different levels of schooling.

The most recent estimates of the levels of these indicators, as discussed in Section 10.1 were assumed to represent the base year of projections, 1995. However, the estimates of expenditure on school uniforms were changed to represent the increasing trend in the amount spent by parents with higher levels of schooling. These estimates are based on the author's personal knowledge about the levels of these expenses in the Maldives. Assumptions of the levels of pupil/teacher ratios and pupil per classroom at different levels of schooling were made on the basis of the targets set in the Fifth National Development Plan (Ministry of Planning, Human Resources and Environment, 1998). These have been discussed in Section 10.1 in detail. However, it is important to clarify the exact pupil teacher ratios and pupil per class room ratios used in assessing the resource requirements at different levels of schooling in the future. It was assumed that the pupil teacher ratio and the pupil classroom ratio would be 32 at the primary and middle school levels and that it would improve to 30 and 25 at the secondary and higher secondary school levels.

Table 10-8: Estimated Annual Expenditure for Education Per Pupil by Level of Schooling, Maldives 1995 (Amounts in Rufiyaa)

Level of Schooling	Govt	Fees	Textbooks and stationary		Total
				Uniforms	
Pre-Primary	2057	360	255	300	2972
Primary	2057	360	255	400	3072
Middle	2057	360	408	500	3325
Secondary	6500	1440	1450	600	9990
High Secondary	6500	1440	1450	600	9990

Source: Ministry of Education, Unpublished data.

The past trend of per capita government current expenditure on education was used to determine the rate of growth in current expenditure on education in the future (Table 10-8). In view of the fluctuating nature of per capita expenditure in the past, it seems a fixed growth rate of 10 percent per annum in per capita expenditure would provide a reasonable set of projections of the likely cost of schooling in the future. It is also assumed that the combined public and private cost of education per child will increase at the same rate throughout the period of projections, which is up to the year 2020.

These costs only include recurrent expenditure per pupil and hence the projected costs would be a reflection of the recurrent costs on education at different levels of schooling. The capital expenditure can be estimated from the projected numbers of classrooms that would be needed by level of schooling (Table 10-9). The actual capital expenditure would depend on, among other things, the number of school shifts per day. As indicated earlier, at present, all classrooms in all schools in the country are used on a double shift basis. The continued use of such a system would help reduce the cost of further capital expenditure by maximising the use of classroom space, and at the same time facilitate sharing of other school resources among a larger school population. Against this, the number of classroom hours spent per pupil will continue to be minimal, thereby affecting the quality and quantity of classroom instruction and curriculum covered.

Table 10-9: Per Capita Government Current Expenditure on Education in Rufiyaa, 1988-1997

Year	Expenditure (in millions of Rufiyaa)	Enrolled Students	Per Capita Expenditure	
			Amount	Percent Increase
1988	30.4	55487	547.88	
1989	45.6	59969	760.39	38.79
1990	57.5	63370	907.37	19.33
1991	83.6	68095	1227.70	35.30
1992	111.8	73642	1518.16	23.66
1993	131.2	78639	1668.38	9.90
1994	137.0	83855	1633.77	-2.07
1995	147.2	87878	1675.05	2.53
1996	196.4	90597	2167.84	29.42
1997	247.7	93375	2652.74	22.37

Source: Statistical Yearbook of Maldives 1998

It is estimated that by the year 2010 a total of 1,573 classrooms will be required to accommodate the student demands at the primary school level. A further 634 classrooms will be required to accommodate the demands at the middle school level. These two levels combine to form the primary schools in the education structure in the Maldives. These are based on the assumption that there will be 32 pupils per classroom.

Table 10-10: Projected Classroom Requirements by Level, Maldives, 1995-2020

Year	Primary	Middle	Secondary	Higher Secondary	Total
1995	1048	435	547	233	2263
2000	1098	510	712	335	2656
2005	1348	439	665	368	2822
2010	1501	581	762	333	3177
2015	1572	607	892	420	3491
2020	1573	634	962	452	3620

Source: Computed by the author

If there is double shifting⁴² of classroom space, the number of classrooms required would be half of the above-mentioned numbers, which makes the total number of classrooms required at the extended primary level (primary and middle school level combined) in 2010 to be 1,041. By the year 2020 the number of extended primary level classes required is expected to decline

42 This refers to the use of classroom space in two different sessions by different groups of pupils – a morning session for boys and an afternoon session for girls.

slightly as a result of fertility decline. With double shifting this number is expected to be 1,103.

The current dynamics of population implies that the demand for classroom space at the secondary school and higher secondary school levels will continue to grow, gradually reaching 962 for secondary and 452 for higher secondary (see Table 10.13). The projections of classroom requirements, like enrolment levels at the higher secondary level are rather tentative due to the difficulties in projecting the demand for schooling at this level. However, since the government has made its target of high participation at the secondary schooling quite explicit in its vision for 2020 (Haveeru News Service, 1999), projections of resource demands for achieving high levels of participation at the secondary level of education are more definitive. Assuming double shifting, the projected number of classrooms required at the secondary level by the year 2020 would be 481.

Table 10-11: Projected Teacher Requirements by Level, Maldives, 1995-2020

<u>Year</u>	<u>Primary</u>	<u>Middle</u>	<u>Secondary</u>	<u>Higher Secondary</u>	<u>Total</u>
1995	1048	435	547	233	2263
2000	1098	510	712	335	2656
2005	1348	439	665	368	2822
2010	1501	581	762	333	3177
2015	1572	607	892	420	3491
2020	1573	634	962	452	3620

Source: Computed by the author

Pupil teacher ratios being assumed to be the same as pupil classroom ratios, the projected teacher requirements at various levels of schooling are the same as the projected classroom requirements without double shifting. Although the capital costs of providing classroom spaces can be minimised by double shifting, it is not a viable permanent option for human capital. Therefore, the projected numbers are the actual number of teachers that will be required in order to cope with the growth in demand for schooling at the primary, middle, and secondary levels. While the projected resource requirements at these levels are more definitive, they are highly tentative at the higher secondary level due to reasons mentioned earlier.

Finding the right numbers of secondary school graduates, who could be trained to take up the teaching opportunities in the primary schools, is expected to be quite straightforward. The bigger challenges will be to find suitably qualified persons to be trained as teachers to take up the secondary school level teaching positions and to find the means to provide them with the desired quality of training.

Assuming that expenditure on education will increase over the next two decades at the rate of 10 percent per annum, it is expected that the recurrent expenditure on education will increase tremendously. These costs do not include pre-primary levels of schooling, which is an essential component of early childhood development. The reason for not including this component in the projections is that in the Maldives, pre-primary education is run by the community, with the contributions from the parents and the community at large. Although some of the pre-primary classes, especially in Male' are subsidised by the government, there are no data on the types and levels of such subsidies available for analysis.

Table 10-12: Projected Actual and Relative Costs by Level of Schooling, Maldives, 1995-2020 (in Millions of Rufiyaa)

Level of schooling	Year					
	1995	2000	2005	2010	2015	2020
Primary						
Actual	103.05	118.77	145.80	162.35	169.94	170.10
Relative	100.00	115.30	141.50	157.50	164.90	165.10
Middle						
Actual	46.26	59.67	51.42	67.97	70.98	74.19
Relative	100.00	129.00	111.20	146.90	153.50	160.40
Secondary						
Actual	162.45	232.71	217.40	248.85	291.48	314.25
Relative	100.00	143.20	133.80	153.20	179.40	193.40
Advanced						
Actual	57.61	91.31	100.32	90.59	114.45	122.93
Relative	100.00	158.50	174.10	157.20	198.70	213.40
Total						
Actual	369.37	502.45	514.94	569.77	646.86	681.46
Relative	100.00	136.00	139.40	154.30	175.10	184.50

Source: Computed by the author

Total combined expenditure by the government and the parents, as indicated earlier, is expected to increase by 54 percent from its 1995 levels by the year 2010. In monetary terms this amounts to close to Rufiyaa 570 million by 2010.

By 2020, the total expenditure needed for the attainment of the levels of school enrolment discussed earlier in this section will be close to double the expenditure levels in 1995.

Expenditure on secondary education is set to increase at a faster pace than expenditure on primary education if high enrolment rates are to be attained at this level. It is expected that if the assumed rates of increase in secondary school enrolment are to be established, expenditure on secondary education would increase by 79 percent of its 1995 levels by the year 2015. In monetary terms this amounts to 291.5 million Rufiyaa, reaching 314.3 million by 2020.

Higher secondary school enrolments are assumed to increase to between 50 to 66 percent of the population in the higher secondary ages by the year 2020. It is expected that at these levels of enrolment, the total expenditure would increase to 114.5 million Rufiyaa by 2015. The total government current expenditure allocation for education in 1997 was 247.7 million Rufiyaa (Ministry of Planning, Human Resources and Environment, 1998b), and the estimated private expenditure by parents on their children's schooling in 1997 was 79.8 million Rufiyaa. Including the middle school expenditure of 73 million Rufiyaa in 2020, the total expenditure for schooling (from grades 1 to 12) in the Maldives in the year 2020 is expected to reach 681.5 million Rufiyaa (see Table 10-12).

Assuming that all pre-primary age children will be enrolled in pre-primary schooling and that the per capita cost of pre-primary schooling would be equal to that of primary schooling, the estimated expenditure for pre-primary education in the Maldives is projected up to year 2020. In projecting the costs it is also assumed that the per capita expenditure will increase by 10 percent every five years from 1995 to 2020. The resulting projections indicate that by the year 2020 it will cost the country 133.7 million Rufiyaa in current expenditure to provide pre-primary schooling for all children age 3 to 5 years old.

The above estimates of the cost of education at different levels of schooling includes the recurrent costs such as salaries for teachers, purchase of textbooks and stationary, provision of school uniforms and school fees. As mentioned earlier, the cost of providing training for teachers and the costs of overall administration of the education system would be extra burdens for the country in the medium term future.

10.5.2 Human Capital Management

The implications of the dynamics of population growth in the Maldives for the size of the current and future labour force have been discussed to some extent in Chapter 9. It has been mentioned that the growth in numbers in the working age population is most timely as the country is currently going through a phase of labour shortage fuelled by three decades of rapid economic growth.

Under the medium variant scenario of population growth and the growth rate of labour force assumed for the projections of labour force by sex (Chapter 9), it is expected that the labour force, or the economically active population in the Maldives will grow from 69,000 in 1995 to 167,700 by 2020, reaching 192,000 by the year 2025. That is, a labour force of 60,150 females and 132,000 males by 2025.

While the absolute numbers in the labour force is expected to increase between 1995 and 2025, the effect of the changes in the age structure on the future labour force can be seen in the fluctuations in the percentages in broad age groups shown in Table 10-13. Comparing the actual projected labour force participation rates with age standardised rates show that while the actual projected labour force participation rate of the total population is expected to increase steadily between the year 2000 and 2025, the increase in marginal under the assumption of a constant age structure. These projections are made of the basis of a slight increase in labour force participation of women and no change in the labour force participation of men from the current (1995) levels throughout the period of projections (See Chapter 9).

Table 10-13: Projected Labour Force, 1995-2025, Maldives

Projection Year	Percentage Distribution by Broad Age Group				Total Labour Force	Total Participation Rates	
	15-24	25-54	55+	All Ages		Actual Projected	Age Standardised
Males							
1995	24.1	60.2	15.7	100	50,327	75.5	75.5
2000	26.4	59.8	13.7	100	60,305	73.4	75.3
2005	29.2	59.5	11.3	100	73,805	74.0	75.0
2010	26.0	64.6	9.4	100	87,855	76.4	74.4
2015	22.0	68.4	9.6	100	101,838	76.0	73.6
2020	22.5	67.9	9.6	100	117,267	75.9	72.6
2025	21.3	69.8	8.9	100	132,054	75.1	71.3
Females							
1995	29.2	58.2	12.6	100	18,713	28.7	28.7
2000	29.1	58.8	12.1	100	22,958	28.3	28.8
2005	30.7	58.6	10.7	100	28,814	29.2	29.2
2010	27.4	63.4	9.2	100	35,132	30.8	29.9
2015	23.4	66.6	10.0	100	41,873	31.4	30.8
2020	24.6	65.1	10.3	100	50,457	32.8	32.0
2025	23.4	66.7	9.9	100	60,153	34.4	33.4
Total							
1995	25.5	59.7	14.8	100	69,040	52.3	52.3
2000	27.2	59.6	13.3	100	83,263	51.0	52.3
2005	29.6	59.3	11.2	100	102,619	51.7	52.4
2010	26.4	64.3	9.4	100	122,987	53.7	52.4
2015	22.4	67.9	9.7	100	143,711	53.8	52.4
2020	23.1	67.1	9.8	100	167,724	54.4	52.5
2025	22.0	68.8	9.2	100	192,207	54.8	52.6

Source: Computed by the author

The projected decline in the number of persons in the labour force in the age group 15-24 reflect the assumptions made in the growth in secondary and higher secondary education in the country. In fact, tertiary level education and vocational training, which should increase if the population is to be adequately skilled to replace the expatriate population in skilled occupations, is expected to retain increasing proportions of persons in this age group in the future.

The fluctuations in the percentage distribution of the projected labour force in the broad age groups are not likely to create major imbalances in the labour market in a small population like that of the Maldives. Much depends on the rate of economic growth in the future and the extent to which the growth in the labour force is able to match the demands of the labour force in terms of

absolute numbers. As long as excess demand exists in the labour market, the minor fluctuations can be adjusted from the numbers in the expatriate labour force.

There are two possible implications of the projected changes in the labour force. In fact, on the one hand, depending on the growth of the economy and the levels of social welfare services and the enthusiasm of the working age population to be economically active, the actual levels of labour force participation may be higher, which would also mean the age structural impacts would also be greater. On the other hand, with the expected growth in school enrolment at secondary and higher secondary levels, youth unemployment may increase as school leavers are unable to find the types of jobs that they desire. Such a situation would lead to serious social and economic problems that may hinder the socio-economic development aspirations of the country. This leads to the issue of human capital development that is applicable to the demands of the labour market. In addition to formal schooling, the importance of technical and vocational education is underlined.

10.6 Summary and Conclusions

The earliest available records show that the population of Maldives has enjoyed high rates of basic literacy for quite a long time. While the literacy levels of males were slightly higher than females in the earlier times, recent data show that at present, females enjoy higher literacy rates than males in the Maldives. This has probably been the most important factor that has contributed to the high demand for schooling among the Maldivian population, as parents aspire their children to achieve higher levels of schooling. The level of demand for schooling among the population appear to have been surprisingly high when modern schools were being introduced in the atolls during the latter part of the 70s and through the 80s. The country's education system went through constant change as the unforeseen demand for education grew.

It appears that the focus of the government hastily shifted from providing educational access to create an environment of demand for education, to a

continuous struggle to cope with a rapid growth in demand during the 80s and 90s. Instead of the government having to push people to meet its educational goals, the people seem to have pushed the government to set higher targets of education.

In terms of providing for the growing demand for education, the issue of population distribution once again seems to be the biggest obstacle. In spite of substantial expenditures on improving the accessibility of schooling to the entire rural population, the relative disadvantage for females in accessing higher levels of schooling still prevails. Even between the islands in the same atoll, the gaps in the quantity, and more crucially, the quality of schooling continues to be large. This would mean that the gap in educational attainment between Male' and the atolls, and between different island populations will continue, especially for females, thus adding to the disadvantage for females to seek modern sector employment.

As indicated in the medium variant scenario of projections in the demand for educational resources, the most testing times for the education sector would be the next 15 years. From then on, the volume of primary and extended primary age population seeking education is expected to decline although with the population momentum effect created by the present age structure the strain on educational infrastructure would continue to resurface at different points of time in the future. In view of this, the current system of double shifting of classroom space seems to be the most viable option for the Maldives. Even with double shifting, considerable investment will be required to create the extra classroom space projected in this chapter. The decline in the numbers seeking primary and extended primary education during the second decade of the 21st Century would mean that the surplus classroom space created could be utilised for the increasing numbers seeking secondary and higher secondary education, which is expected to continue to grow.

The most challenging human capital development task that lie ahead will be to find suitable candidates to train as secondary and higher secondary school teachers, especially from the atolls. The government will need to devise ways

to overcome such difficulties. Although there are plans to establish a higher education institute in the country and also to provide distance education by affiliation with regional universities, it is questionable as to whether such an approach would yield the desired outcomes in appropriate time.

Appropriate secondary qualifications are essential for further vocational education in order to equip the emerging labour force to be efficiently absorbed into the labour market. It is an issue that cannot be taken indolently. There already exists an emerging pattern of youth unemployment that is already causing concern in the society (Ministry of Youth and Sports, 1997).

The projected growth in the labour force is expected to reach levels where the current trend in the growth of expatriate labour may be abated in the near future. Proper management and training of the Maldivian labour force is expected to alleviate this heavy burden on the national economy by replacing expatriates in skilled and highly paid jobs by Maldivians.

The growth of a skilled labour force that has the right kinds of skills to match the types of skills required by the Maldivian economy is as important as achieving economic growth that would assure employment for the growing numbers in the labour force. The former would require that the country's human capital development programmes be adequately tailored to the current and future needs of the job market. If the current levels of economic growth continue (see chapter 2), the latter issue is likely to be of minor policy concern at least in the next decade or so. However, the projected age structural effects on the different age groups of the labour force are likely to have minor oscillatory effects on the supply of labour alternatively, at the entry levels and later at more mature ages.

A review of the levels and trends in economic development will show how the demands for the quality of human capital – education and skill levels – have changed in the past and identify the new skills that are in demand at present, in addition to the issues of the equitable distribution of the benefits of economic

growth to the entire population. We will now turn to an analysis of economic development in the Maldives in the next chapter.

Chapter 11: Economic Development

The present chapter attempts to provide an analysis of the levels, trends and differentials in economic development in the Maldives. The changes in the structure of the economy and some of the major implications of these changes for sustainable development will be discussed in this chapter.

Economic development, as defined by the conventional measures such as GDP alone does not measure the actual levels of development in a population, as it does not reveal the extent of disparities in the levels of living between the different sections of the population. Measurement of economic development has evolved accordingly as economists became increasingly aware of the existence of income disparities in spite of the attainment of certain targets of economic growth in many developing countries. The reduction or elimination of poverty, of inequality, and of unemployment within the context of economic growth came to be recognised as essential conditions of economic development. Following these changes in the thinking of development, Todaro (1997:16) asserted that,

...development must...be conceived of as a multidisciplinary process involving major changes in social structures, popular attitudes, and national institutions, as well as the acceleration of economic growth, the reduction of inequality, and the eradication of poverty. Development, in its essence, must represent the whole gamut of change by which an entire social system, tuned to the diverse basic needs and desires of individuals and social groups within that system, moves away from a condition of life widely perceived as unsatisfactory toward a situation or condition of life regarded as materially and spiritually better. (Todaro, 1997:16).

Being a small island-developing nation that remained until recently, virtually unknown to, and isolated from the rest of the world, Maldives' experience of economic development of the post-Second World War type is also fairly recent. This chapter looks at how and when, significant economic changes began to take place in the Maldives and how they have changed the structure of the economy at the macro-level. Compositional changes in the economy and the changes, as seen from the distribution of the workforce by economic

activities, are analysed to get an understanding of these factors at the macro-level of development.

In order to understand how the economy has evolved from a primary-sector economy to a largely tertiary-sector-oriented economy, it is important to begin the discussion from an historical perspective. Analysis in this chapter begins with some impressions of the early economic activities in the Maldives, based on the scanty ethnographic literature on the Maldives from some early observations. Subsequent analysis will be based on census data and from other published and unpublished sources.

11.1 Composition of the Economy and Changes

Earliest accounts of the Maldives, by ancient travellers who visited the islands, suggest a well-established system of production and export of quality products to the regional trading posts of the central Indian Ocean rim. The Arab traveller, Suleiman of the 9th Century A.D. provides some of the earliest accounts of the economic activities of the people of the Maldives:

...their money consists of cowries...they make tunics woven of a single web, with sleeves, ornaments and borders...they build their ships and houses, and load them with their produce in a like manner. Quoted in Gray, (1890:428)

These accounts illustrate the types of economic activities that prevailed in the Maldives in historical times. The earliest available quantitative data on the types of occupations in the Maldives are from the limited tabulations of economic activities from the 1911 and 1921 censuses of the Maldives.

As we have seen in Chapter 7, the most important economic activity for men at the beginning of the 20th Century was fishing and the most important economic activity for women was coir-rope making indicating that the economy of Maldives did not change much since historical times until fairly recently. With the demise of the use of Maldivian cowry shells as small money in the regional economies and in the Maldives, cowry collection ceased to be a major economic activity in any part of the Maldives in more recent times.

11.1.1 Changes as Percent of Gross Domestic Product

Significant economic change in the Maldives began only after it attained independence in 1965 and the subsequent political changes that occurred soon after (see chapter 2). Two main factors were instrumental in bringing about the economic changes: changes in the fisheries sector, and the introduction and growth of tourism.

Traditionally, the only type of fish export was *Maldivian fish* and the only market to which it was exported was Sri Lanka. The economy of Maldives was highly vulnerable. The first test of its vulnerability was displayed when, in the early 1970s, Sri Lanka was faced with a severe foreign exchange crisis, prompting their government to limit its imports of *Maldivian fish*. The sharp fall in export of *Maldivian fish* to Sri Lanka incited the Maldivian government to look for alternative means of fish export. Foreign companies were invited to send vessels to the Maldives to collect the catch of local fishermen in order to export the fish (The World Bank, 1980).

Assisted by a mechanisation programme of the country's fishing fleet that began in the 1970s, under a government credit scheme and backed by international aid, the export of fresh fish proved to be extremely successful. Today the entire commercial fishing fleet is mechanised and annual fish catch increased from 61,900 metric tonnes in 1986 to 107,358 metric tonnes in 1997. However, probably due to the diversification of the economy and emergence of other sectors, the contribution of the fisheries sector to the Gross Domestic Product (GDP) has declined. The contribution of fisheries to the GDP was 22.5 percent in 1981. In 1996 it amounted to only 10.7 percent (Table 11-1).

While the relative contribution of fisheries to the GDP has declined over the past two to three decades, the relative contributions of the tourism and the trade sectors have increased significantly. In 1981, tourism sector contribution amounted to 10.8 percent of the GDP and the contribution of the trade sector amounted to 9.9 percent. By 1996 these amounts have increased to 19.1 percent and 19.4 percent, respectively.

Table 11-1: Percentage Distribution of Gross Domestic Product (GDP), 1981 – 1996 (at 1985 Constant Prices)

Sector	1981	1986	1991	1996
GDP (in millions of Rufiyaa)	368.5	651.9	1,054.8	1448.0
Primary sector	43.2	30.1	25.5	19.7
Agriculture	18.3	11.7	8.6	7.3
Fisheries	22.5	16.6	15.1	10.7
Coral and sand mining	2.4	1.9	1.8	1.6
Secondary sector	13.0	13.6	14.6	15.8
Construction	7.7	8.1	8.8	9.7
Manufacturing (including Electricity)	5.2	5.5	5.8	6.1
Tertiary sector	43.8	56.2	60.0	64.5
Distribution	9.9	15.9	17.4	19.4
Transport	11.7	5.2	6.3	7.1
Tourism	10.8	17.2	17.4	19.1
Real Estate	4.2	4.3	4.2	4.2
Services	2.2	5.1	5.8	6.4
Government Administration	5.0	8.5	8.9	8.4
GDP per Capita (Rufiyaa)	2,290.0	3,427.0	4,724.2	5653.0
GDP per Capita (USD)	n.a.	482.8	665.6	796.4

Source: Statistical Yearbook of Maldives, various years.

Note: n.a. indicates data not available.

As discussed in Chapter 10, the trade sector and the construction sector have benefited from the growth of tourism. While some of the benefits are likely to be more directly related, others are more likely to be indirect. The direct benefits for the construction sector may be the numerous construction projects offered by the construction of new resorts and the continued up-grading and renovation works of the existing resorts. The indirect benefits may come from the added capacity of private households to construct better and bigger houses through the flow of wealth to these households from the tourism sector activities. The direct benefits for the trade sector are the increase in the demand for food, construction materials and hardware needed for the construction and running of the resorts. The indirect benefits come from the increased purchasing power of the individual households and the growing demand for capital and consumer goods by the general population. While the contribution of the construction sector to the GDP has grown from 7.7 percent in 1981 to 9.7 percent in 1996, the contribution of the trade sector grew much more rapidly, from 9.9 percent in 1981 to 19.4 percent in 1996.

As shown in Table 11-1, the total GDP grew two-fold between 1986 and 1996, from 652 million Rufiyaa to 1,448 million Rufiyaa (at 1985 constant prices). In spite of the high rates of population growth in the recent decades, the high rate of economic growth have enabled the per capita GDP to increase (at 1985 constant prices) from 3,427 Rufiyaa to 5,653 Rufiyaa during the same period (Statistical Yearbook of Maldives, 1998).

11.1.2 Changes as Percent of Workforce

While the overall economy has grown in the past, there appear to be significant urban rural differences in the patterns of economic development. Analysis of employment data from the census revealed the effects of the concentration of the national economy from the pattern of distribution of occupational types by urban and rural areas (see Chapter 10). In the rural areas, most males were more active in fishery and agricultural activities, while females were involved in crafts and related work. In the urban areas, there appears to be a high degree of concentration of females in clerical and related jobs, while males were distributed over a wider spectrum of occupations.

The variety of industrial categories of employment⁴³ of the population would indicate the diversity of the economy. Analysis of employment data from the past censuses of the Maldives by different industrial categories show, that there has been a significant expansion of the Maldivian economy during the course of the 20th Century. As indicated by these and other measures of development in the Maldives, most of the growth seems to have occurred since the 1970s.

Comparison of employed population by industry for 1985 and 1995 censuses shows a clear shift of employment from the traditional sectors towards the modern sectors of the economy. For instance, between 1985 and 1995 the percentage of persons employed in agriculture declined from 4.3 to 1.7 percent

⁴³The classifications of employed population by industrial categories were made on the basis of the International Standard Industrial Classification (ISIC-90) of the United Nations (United Nations, 1990). Although the classifications used for the coding of industrial data for the census of 1985 was the 1968 version (United Nations, 1968), these codes were updated using the Correspondence Table: ISIC, Rev.1 to Rev. 3 in ISIC-90 (United Nations, 1990).

for males and 12.3 to 7.5 percent for females. On the other hand those employed in tourism increased by over six percentage points and those employed in the transport and communication sector, which are closely linked to the tourism sector, increased by close to three percentage points. The increase in tourism sector participation was greater for males than for females (see Table 11-2). Interestingly, both for males, as well as females, the proportion of employed in public administration declined as a proportion of the employed. In the absence of a restructuring of the public sector, this shows the importance of the growth in private sector employment, facilitated by the growth of the economy.

Table 11-2: Employed Population Age 15+ by Industry and Sex, 1985 and 1995, Maldives

Industry	Males			Females			Both sexes		
	1985	1995	Chng	1985	1995	Chng	1985	1995	Chng
Agriculture	4.3	1.7	-2.6	12.3	7.5	-4.8	6.0	3.3	-2.7
Fishing	30.6	25.3	-5.3	2.2	1.3	-1.0	24.5	18.8	-5.7
Construction and quarrying	8.0	6.5	-1.5	0.6	0.3	-0.3	6.4	4.8	-1.6
Manufacture of apparel	3.4	1.0	-2.3	54.3	30.4	-23.9	14.3	9.0	-5.4
Other manufacturing	11.0	9.6	-1.4	5.0	12.5	7.5	9.7	10.4	0.7
Trade	6.4	9.1	2.8	2.7	4.6	1.9	5.6	7.9	2.3
Tourism	4.8	13.2	8.4	0.1	1.0	0.9	3.8	9.9	6.1
Restaurants	2.2	1.1	-1.1	0.1	0.4	0.3	1.8	0.9	-0.8
Transport and communication	8.4	11.9	3.5	0.9	3.1	2.2	6.8	9.5	2.8
Business services	1.0	2.8	1.8	0.6	3.7	3.1	0.9	3.0	2.2
Health and education	2.1	3.9	1.8	7.0	19.1	12.0	3.1	8.0	4.8
Public administration	15.5	8.7	-6.8	11.1	8.4	-2.7	14.5	8.6	-5.9
Others	2.5	5.2	2.7	3.0	7.6	4.6	2.6	5.9	3.3
Total	100.0	100.0		100.0	100.0		100.0	100.0	
Employed persons	39,056	48,716		10,729	17,972		49,785	66,688	

Source: Computed by the author from census data

Changes in the industrial structure of employment differ between the sexes. While the shift in male employment was mostly towards tourism, trade, transport and communication and related industries, female employment moved mostly towards the social sectors such as education and health care and

towards home based production such as handicraft making and preparation of food items for sale (other manufacturing)⁴⁴.

Among the industries where male employment as a proportion of employed have declined, industries such as the manufacture of furniture and construction are areas where the growth of expatriate employment has been the highest (see Chapter 7). The other sectors are those where female participation has increased recently.

Table 11-3: Employed Population 15+ By Industry (Percentage Distribution Within Broad Age Groups), Maldives, 1985 and 1995.

Industry	15-24		25-34		35-44		45-59		60+	
	1985	1995	1985	1995	1985	1995	1985	1995	1985	1995
Agriculture	3.3	1.2	4.8	2.4	6.7	3.4	9.5	5.8	10.5	6.9
Fisheries	20.9	12.8	24.1	18.4	23.5	22.9	29.3	21.8	29.9	23.0
Construction and quarrying	5.6	3.3	6.7	5.6	6.8	6.1	7.2	4.9	6.0	3.7
Apparel	15.2	7.2	13.5	8.9	13.5	9.7	13.6	9.5	17.2	11.7
Other manufacturing	9.0	8.0	10.4	10.1	9.9	11.9	9.4	11.9	11.0	11.6
Trade	4.4	7.0	6.1	8.3	7.6	9.0	5.9	8.3	4.1	6.1
Tourism	6.8	18.6	3.2	10.1	2.7	5.7	1.4	4.7	1.2	3.3
Restaurants	3.3	1.0	1.5	1.1	1.0	0.9	0.7	0.7	0.4	0.5
Transport and communication	7.4	10.3	9.4	11.8	7.3	10.1	4.0	6.6	2.3	4.3
Business services	1.2	2.0	1.4	2.2	0.8	2.4	0.3	4.9	0.1	6.6
Health and education	3.4	12.0	2.8	7.6	2.5	5.3	2.9	6.0	4.9	7.4
Public administration	17.1	10.4	13.8	7.9	14.7	7.0	12.7	9.0	10.4	8.7
Others	2.5	6.1	2.2	5.8	3.0	5.6	3.2	5.8	2.1	6.2
Total	100	100.0	100	100	100	100	100	100.0	100.0	100.0

Source: Computed by the author from census data

It is evident that Maldivians are moving away from more menial types of occupations towards occupations that are more skilled and better paid. The growth of tourism has created several supporting industries around it and many opportunities for employment. At the same time, the growing demand for social services is expanding the opportunities for employment in social sectors

⁴⁴ These sub-categories differ for males classified under other manufacturing; for males the more relevant sub-categories are boat building, metal fabrication and furniture

such as education, health care and other personal and social services. It is also apparent that while fisheries continue to dominate the labour market as the single most important sector of male employment, other sectors are attracting and providing employment for increasing proportions of the labour market.

It can be seen from Table 11-3 that while these shifts in the industrial distribution of the employed population are not restricted to a particular age group of the population the most significant movements, as expected, occurred among the younger age groups. For instance among the employed population aged 15 to 24 in 1985 only 6.8 percent were employed in tourism as opposed to 2.7 percent among 35 to 44 year olds. In 1995 these percentages increased to 18.6 percent and 5.7 percent for two age groups respectively. The only exception to this trend is other manufacturing where the proportions declined for younger persons while it increased for older persons.

These developments would call for the supply of skilled labour. This raises the issue of human capital development that is targeted at the types of skills that will be required by the high growth areas of the economy, namely tourism, distribution, transport and communication and even fisheries as this sector modernises and sophisticated skills are demanded. It is thus important to observe the dynamics of these sectors more closely.

11.2 Special Focus on the Vital Sectors of the Economy

11.2.1 Tourism

Over a period of 25 years, from its very inception in 1972, tourism has grown to become the most vibrant sector of the Maldivian economy. Contribution of the tourism sector to the GDP has increased rapidly since its introduction. In 1981 tourism contributed Rufiyaa 39.8 million to the GDP (11 percent). By the end of 1996 this amount has increased to Rufiyaa 276.9 million (19 percent) (Statistical Yearbook of Maldives, various years). Both these figures are given in 1985 constant prices and hence are comparable.

The development of tourism in the Maldives has, from its very beginning, been left to the private sector, with the government merely playing a regulatory role.

The most significant government input to the boost of tourism in the Maldives was perhaps the establishment of the Male' island International Airport which facilitated direct air links with the major tourism markets in Europe and East Asia.

Initially, when resort development was rather modest, funds for resort construction and maintenance came from the owners' resources. With the introduction of commercial banking in the country in 1975, they began to supplement the owners' resources. However, as resort construction reached so far unparalleled levels in 1979 with the opening of eight new resorts in that particular year, bank lending dried up, prompting resort operators to look for alternative sources of financing. Large tour operators from Europe provided the much-needed funds to the resort owners for the development and operation of their resorts by block-booking individual resorts and paying in advance (The World Bank, 1978). It is likely that with such arrangements, which exist even today, a large proportion of the costs of the tour packages are retained by the tour operators in the sending countries, while the profits made by the resort operators in the Maldives have been comparatively reduced.

Although most resorts are owned and managed by Maldivians, some important activities in the resorts, such as the establishment and the running of the diving school, were contracted to established diving clubs from Europe. European diving schools and tour operators, through their connections in the resorts in the Maldives have over the years secured full management contracts with some of the resort owners.

From the very beginnings of tourism in the Maldives, resort ownership was almost wholly in the hands of Maldivian entrepreneurs. However, the infrastructures of tourist resorts in the Maldives have changed tremendously over the years and with it the costs of investments have also increased. In addition to the sort of arrangements with overseas tour operators that was mentioned earlier, the increasing costs of investments have prompted increased numbers of local investors of tourist resorts to get into management contracts

with foreign parties, either handing over the full management or as management partnerships between local and foreign investors.

The islands on which the resorts are established are leased to resort owners by the government, as all land in the Maldives is government owned (Ministry of Tourism, 1998). The term 'resort ownership' therefore refers to the ownership of the investment. Up to now, only a small number of resorts in the Maldives have their investments fully owned by foreign parties, although the number has increased recently. In 1997, there were 73 tourist resorts in the Maldives; of which, 68 percent were owned by locals, 7 percent were foreign owned, and the rest were either jointly owned by the local private sector and foreign parties, or government and foreign parties, or just by the government (see Table 11-4).

Irrespective of the ownership of the resort investment, close to one third of all resorts in the Maldives are directly managed by foreign parties and a further 12 percent are under joint local and foreign management. Even in the latter case it is highly likely that much of the management power will lie with the foreign party with little active participation of the local party.

Table 11-4: Number of Tourist Resorts by Ownership and Management, Maldives, 1996 and 1997

Ownership	Management							
	Total		Local		Foreign		Foreign/local	
	1996	1997	1996	1997	1996	1997	1996	1997
Total	73	73	41	41	23	23	9	9
Local	56	50	34	35	17	13	5	2
Foreign	2	5	0	0	2	5	0	0
Foreign/local	4	7	0	0	1	2	3	5
Government	9	9	7	6	1	1	1	2
Government/foreign	2	2	0	0	2	2	0	0

Source: Table VIII-5: Statistical Yearbooks of Maldives, 1997 and 1998

In fact, as seen in Table 11-4, foreign control of the Maldivian tourism industry is gradually increasing. With the number of tourist resorts remaining the same at 73 in 1996 and 1997, the percentages appear to have shifted during the one-year period, towards foreign control. During this period, six resorts changed hands from full local ownership to either full foreign ownership or to joint

ownership between the local investor and a foreign party. Three of the resorts went into full foreign ownership with full foreign management, while three went into joint ownerships with foreign investors, either with full foreign management control with a joint management. As mentioned earlier, this in effect means that these six resorts went under foreign control.

Employment in the tourism sector has been beneficial for the general population in both directly and indirectly raising their standards of living. The diverse nature of the activities that actually contribute to the tourism sector makes it difficult to determine the exact volume of the tourism sector in terms of the population employed, whether it is categorised by occupation or by industry. The industrial categories that are directly related to tourism in the Maldives are, 'hotels; provision of short stay accommodation' and 'travel agencies and supporting activities to transport'. These two categories combined together comprise almost 12 percent of the employed population; second after fisheries, which comprises almost 19 percent of the employed population, in 1995. When sea and air transport (which involves transfer of tourists between the airport and their respective resorts) are accounted for, the actual share of the employed population by the tourism sector could be as high as 18 percent in 1995. There are still other categories such as retail sales of souvenir items through souvenir shops catering almost solely to tourists, which contribute to the tourism sector, but are not identified separately from the rest of the retail trade.

Due to the difficulties of sorting out what can be classified as the tourism sector, from those categories other than 'hotels; provision of short stay accommodation', the rest of the analysis in this section will focus largely on this category alone, which provides information on purely resort related employment. As mentioned elsewhere in this thesis, males have almost wholly dominated employment in the tourism sector in the Maldives. In 1985 only 0.7 percent of those employed in this sector were female. There has been a slight improvement since then – in 1995 females comprised 2.8 percent of those employed in the tourism sector. This is a very significant change considering

the reluctance of parents and the society to send their daughters for employment in the tourist resorts.

Some resorts located close to inhabited islands in the tourism zones outside Male' island atoll have expressed a willingness to provide daily transport between their home island and the resort, if these islands are able to provide sufficient numbers of secondary school graduates, for employment in the resort (Qualitative interviews conducted by the author in Mahibadhoo island, 1998). With growing numbers of secondary school graduates from the island schools there is good prospect that the capacity for island populations to cater to such demands will increase. As new tourism zones are established in the atolls in the future, under the new Tourism Master Plan, it is likely that the proportion of females in employment in tourism will continue to increase. In 1998, 12 new islands from new tourism zones were leased to be developed as tourist resorts. It is most likely that, in the near, if not immediate future, the majority of those seeking employment in these resorts will come from the surrounding inhabited islands in the atoll.

Table 11-5: Population* Employed in Industrial Category 'Hotels; provision of short stay accommodation', by Numbers and Percentage According to Occupational Category, Maldives 1985 and 1995

Occupational Category	1985		1995	
	Persons	Percent	Persons	Percent
Legislators and senior government officials	3	0.16	7	0.11
Directors, chief executives and managers	116	6.04	350	5.30
Technicians and associate professionals	80	4.16	584	8.84
Other associate professionals	26	1.35	275	4.16
Clerks, housekeeping and related workers	414	21.55	1987	30.07
Skilled building trades workers	99	5.15	682	10.32
Skilled handicraft and related trades workers	356	18.53	290	4.39
Elementary occupations	827	43.05	2402	36.34

* Data relate to Maldivian nationals only.

The participation of Maldivians at all levels of occupations in the tourism sector has been increasing. The most significant aspect of this is the growth of Maldivians in top management positions within the industry. Considering the small number of tourist resorts in the Maldives, the numbers of Maldivian personnel reported in management jobs are quite high. As seen in Table 11-5, those in the category 'Directors, chief executives and managers' increased by more than twice during 1985 to 1995. The most increase is, however, in the

number of professionals. These are often the most highly paid jobs below the managerial level in the tourist resorts and are believed to be dominated by expatriates. More recent data on employment will be needed to see if the changes in the resort ownership and management are having an effect on the ability of Maldivians to increase their participation in the top level jobs in management and services areas of the tourism industry.

The overall increases revealed from the census data in the proportions of workers in skilled occupations are most positive. The decline in the numbers of skilled handicraft and related workers is perhaps due to the growth of handicraft making as a separate industry making it more convenient for the resort operators to buy handicraft products from the suppliers in Male' island rather than employing someone to make the products at the resort itself. An appreciable change is the decline in those employed in elementary occupations as a percentage of all employed persons in the tourism sector. This is one area where employment of expatriate labour has increased in the past years (see Chapter 7). It is likely that unless measures are taken to reduce the number of elementary occupations in the resorts, as well as in other sectors of the economy, the import of expatriate unskilled labour will be necessary to sustain the present levels of development.

It is most relevant to note that the growth of tourism has also brought about a revolutionary change in the local boat building industry, mainly to cater to a demand, from the tourism sector, for high quality floating accommodation for diving enthusiasts. Total bed capacity on such vessels increased from 546 in 1987 to 1484 in 1997, a growth of 172 percent. While the tourist arrivals for such accommodation is accounted for through regular reporting channels, the labour force aspect of this vital part of the tourism industry is included in the transport sector and not separately accounted for. This is an important consideration for future data collection exercises.

11.2.2 Fisheries

The main form of livelihood of the Maldivians has always been fishing. The predominant method of fishing in the Maldives has always been pole and line. It has been estimated that about 90 percent of all the fish caught in the Maldives is by this method (Statistical Yearbook of Maldives, 1998). Prior to the introduction of mechanisation of fishing boats, which are locally constructed fishing vessels called 'dhoni', fishing was conducted by sail powered dhoni. Due to its dependence on the weather, the distances travelled and the amount of fish caught varied greatly from year to year. The World Bank (1980) observed, from carefully recorded village level data on the fish catch, kept at the Ministry of Fisheries, that the annual fish catch in the pre-mechanisation days fluctuated from 27,900 metric tons in 1967 to 35,400 metric tons in 1974 down to 25,800 metric tons in 1978.

During the days of the sail powered fishing dhoni, it was quite common for fishermen to spend weeks away from their home island during some seasons, as the migratory nature of the tuna requires them to travel considerable distances from their home island to reach the fishing grounds. During such extended trips they put up camp on an uninhabited island close to where good fishing is found, returning to that island every evening with their catch and processing the catch on the island by boiling or salting and drying in the sun. They would stay in the island until such time when a considerable amount of processed fish is collected to justify a trip to Male' island where they sell them for cash. They will then return back to their families with rations and other necessities bought from the markets in Male' island. Life was rather simple and more or less at subsistence levels (Qualitative studies by the author in Mahibadhoo, 1998).

In predominantly fishing villages (islands), where men do the fish catching and women participate actively in the processing, by the time fishermen return back to their home island from a day's fishing trip, it is mostly after sunset. By the time the fish is cut and ready for boiling a considerable part of the night is gone. This is usually where the role of the woman begins. After having

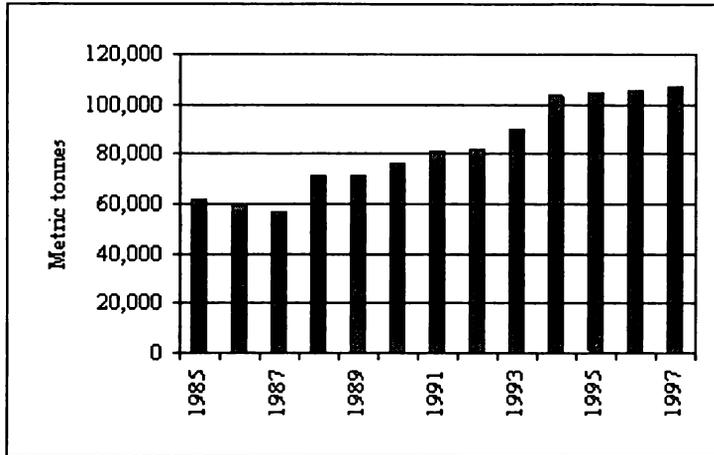
worked the whole day, taking care of the children, cleaning the house, and several other activities, it would be the time when she should be taking a rest, that the task of fish processing has to begin, thus depriving her of the much needed rest.

The environment in which home based fish processing is done in the traditional island setting is usually a smoke filled environment which may not be particularly favourable for the health of those who work in this area. It is not only the working environment that would affect women's health, but the hours of work is also likely to have a negative impact of their health, too.

The main economic benefit for the fishing families that came through the changes in the marketability of fish is by being able to sell the days fish catch to the fish collecting vessels, or the canning factory, or to the markets in Male' island, for ready cash. The family income of fishermen is likely to be better than what they would have fetched by selling processed fish to the only markets in Male' island. In fact, fishermen themselves see these changes positively (Qualitative studies by the author in Mahibadhoo island, 1998).

Mechanisation of the fishing fleet, establishment of a fish canning facility in the country and dispatch of fresh fish collecting vessels to the atolls, partly to supply to the fish canning facility and to export as frozen fish to South East Asian markets during the 70s, has changed all this. Except for a few sluggish years in 1986, 1987 and 1989, the annual fish catch has increased gradually with continuous modernisation of the fishing dhoni, from 61,900 metric tons in 1985 to 107,358 metric tons in 1997. Fish processing shifted from a largely home-based enterprise to a more institutional enterprise.

The other effect of mechanisation is the decline in the number of crew per fishing dhoni. A mechanised dhoni requires a smaller crew to operate it. With the mechanisation of the dhoni, local fishermen have invented automated labour saving devices such as the devise used on board to attract the fish toward the fishing dhoni. Previously one person was needed to do this job.

Figure 11-1: Annual Fish Catch, Maldives, 1985 - 1995

Source: Statistical Yearbook of Maldives, 1998

In 1985, the census recorded 12,137 fishery workers in the country. The census of 1995 recorded 11,614 fishery workers - a decline of 617 persons. This means that per capita fish catch has increased from 4.9 metric tons per fisherman per year in 1985 to 9.1 metric tons per fisherman per year in 1995.

In the presence of a vibrant sector such as the tourism sector, it is widely believed that the fisheries sector will fail to attract younger people and its workforce will gradually age unless it can be made more attractive for younger persons (Ministry of Planning, Human Resources and Environment, 1998). The government has recognised this early on and has taken measures to positively project the status of fishermen in the society and increase the general awareness of the younger, educated persons on fisheries. In this context, among the several programmes for the recognition of the fishermen's role in the national identity, a National Fisherman's Day has been marked annually since 1980.

Apart from such symbolic recognition, other more substantial measures such as the introduction of fisheries science in the national curriculum as a separate subject taught at the secondary school level, offering papers at the General Certificate of Education (London) Ordinary and Advanced levels would probably be more beneficial in modernising and sustaining the fishing industry.

Besides such measures, perhaps the most important attraction would be the improvements in the financial rewards gained from fishing.

Although, traditionally, the only type of fish that was exported from the Maldives, or for that matter, caught in the Maldives in significant quantities, has been tuna. Today, however, in addition to tuna fishery, Maldivians have discovered the high financial returns from certain types of reef fishery, such as the grouper. As the demand for reef fish grew with the increasing demand for such varieties for the consumption by the tourist population and also with the discovery of more lucrative export markets in the countries of East Asia by Maldivian fish exporters, the types of fish that are caught for commercial purposes have also been diversified. Recent years have seen a boom in exports of live grouper to exotic markets of East Asia such as Hong Kong and Japan. The high prices paid for such varieties by exporters have prompted the participation of younger persons in the fisheries industry and for several fishermen to switch to grouper fishing in the recent years.

Glamorous as it is, the sustainability of high levels of income for fishermen through exploitation of marine resources such as the grouper fisheries remains highly questionable. Some scientific studies that are being conducted by the government is expected to provide a knowledge base on different types of marine resources and the extent of their availability in the Maldivian seas (Ministry of Planning, Human Resources and Environment, 1998). Such studies are crucial for the formulation of guidelines and policies to ensure that all marine resources in the Maldives are sustained without being over-exploited to extinction. For example; it is believed that the sizes of grouper that is being caught by local fishermen are becoming smaller in size, indicating that this valuable resource is being over exploited (Hamdhoon, 1999).

Over exploitation of certain types of marine resources such as the 'sea cucumber' in the past has prompted the government to restrict its exports. Previously, the government, through the State Trading Organisation had a monopoly on the export of reef fish and salted, dried tuna. This monopoly was abolished in 1989 and soon the private sector dominated the exports of these

varieties. These two varieties continue to be the major form of private sector fish exports. Other forms of private sector export of marine products include dried *Maldivian fish*, sashimi grade fresh and chilled tuna, live tropical fish and other varieties. The fresh and chilled tuna is being supplied to the sashimi markets in East Asia and Japan (Ministry of Planning, Human Resources and Environment, 1998).

Some fishermen from islands located in close proximity to the tourist resorts have been benefiting from other types of reef fisheries. Several resorts have made contracts with fishermen to provide them with all sorts of reef fish. Getting into such a contract is seen to be highly beneficial for these fishermen as they are then able to have a guaranteed market as well as ready cash at a fixed rate of pay for their catch. In addition to this there are other fringe benefits (Qualitative studies conducted by the author in Mahibadhoo, 1998).

So far the ability of the Maldivian fishermen to exploit the vast area of the Maldives Exclusive Economic Zone (EEZ) remains strictly limited. In 1996, when the government issued licenses to several foreign fishing vessels to fish in the EEZ, it reserved a 75-mile zone for the exclusive use of the local fishermen. However, the existing local fishing fleet is unable to effectively exploit beyond 45 miles from the shores (Ministry of Planning, Human Resources and Environment, 1998). This leaves much room for the unpoliced foreign fishing vessels to abuse their fishing privileges within the EEZ and within the 75-mile exclusive zone. Several overseas vessels have been caught poaching in the Maldivian waters, often by local fishing vessels, well within the radius reserved for the local fishermen.

Although the current fishing fleet of the Maldivian fishermen lacks the capacity to venture beyond 45 miles of the 200-mile EEZ, recent developments in this area indicate that capacity of Maldivian fishermen to exploit the fishery resources well beyond the 45 miles may not be a distant dream. With private initiatives, fishing dhoni building is going through a rapid stage of development. Larger and better dhonis, with sleeping accommodation for the entire crew and up to date communication devices installed, are being built

with lightweight fibreglass material. These are accompanied with powerful engines that allow them to travel greater distances in less time. On board fish freezing facilities are also an emerging feature in these new generation fishing dhonis (Latheef, and Naseer, 1999).

With such active participation and initiative from the private sector, the fisheries industry in the Maldives is likely to expand and continue to be a major source of employment for the population and a vital source of export earnings for the national economy in the future. However, private sector participation in the expansion and modernisation of the fisheries sector will not be sustainable if the returns for the private sector are not economically attractive. While several incentives are provided to the private sector by the government to improve the fish catch, several restrictions also exist that limit the involvement of the private sector in the development of the fisheries industry in the Maldives. Most of these restrictions are of a protectionist nature, laid down to protect the state owned enterprises that are involved in the processing, packaging and export of fish and fish products, to maintain high profits.

Availability of bigger and faster fishing dhonis for fishing that can travel greater distances is likely to increase the fish catch significantly. However, as local fishermen have experienced frequently during the peak fishing season, if the fish-collecting vessels and the freezing plants that normally buy the fish catch from local fishermen in bulk are unable to absorb their catch, the fishermen not only loose by wasted effort and loss of income, but large quantities of fish get wasted and have to be simply dumped back into the ocean. Sometimes, some amount of such excess catch are bought by the private sector fish processors who prepare salted dried fish or dried *Maldivian Fish* for export. During the low fishing season the local fish canning factory reports deficit supply of fish and the factory operates at far less than its capacity (Haveeru Daily Online, 1999).

11.2.3 Trade

Throughout its recorded history, Male' island has been seat of the government and the centre of trade in the Maldives. In fact, Male' island has been the country's only port for trade with the rest of the world, except during the days of the British Air Force Base in Gan island when overseas goods were imported directly to Gan without first passing through Male' island (The World Bank, 1980). This link was severed with the closure of the Royal Air Force base in Gan in 1976 and remained so until recently when air and sea links were re-established. Although the re-establishment was mainly for the purposes of the apparel export processing industry and the tourist hotel in Gan, this link is likely to develop with the development of Addu atoll as a regional growth centre for the southern islands (Ministry of Planning, Human Resources and Environment, 1998).

Foreign traders played a dominant role in early Maldivian commerce since Bora (Muslim) traders from western India were, for the first time, allowed to settle and establish godowns in Male' island in the 1860s (The World Bank, 1980). They continued to dominate trade in the Maldives until the 1960s when in a bold step taken by the then government, all foreign traders were revoked of their trading permits and expelled from the country. The government established its own trading company and took on the task of importing the essential food requirements for the population and the export of local produce such as processed fish and other marine products. This company, which later evolved into the present State Trading Organisation had the sole authority of importing essential food items and exporting of dried *Maldivian fish* until fairly recently.

With the controls of the local trade by the Bora traders gone, small local businesses began to flourish, largely nourished by a thriving entrepot business that was created as a result of restrictive trade policies in neighbouring India and Sri Lanka. Goods were imported to the Maldives, mainly from Singapore and informally re-exported to these countries. Male' island remained a duty free port until 1986 when, for the first time, customs duties were levied on all

goods imported into the Maldives. Even today this informal business continues to India by way of Indian ‘tourists’ who visit the Maldives on a regular basis, but probably on a far more limited scale. With import liberalisation in Sri Lanka in 1977, re-exports to that country has diminished in importance (The World Bank, 1980).

With the growth in tourist arrivals, resort construction, and increased per capita income levels, the trade sector has become the leading sector of the GDP. With almost all food items and consumer goods being imported from abroad, the trade sector in the Maldives is a largely import based system. Other than marine products, few items are exported from the country. In 1981, the percentage of GDP contributed by the trade sector was 9.9 percent. In 1997, this sector contributed 19.7 percent of the GDP. (Statistical Yearbooks of Maldives, various years).

Table 11-6: Trade Sector Workers by Region and Sex, Maldives, 1985 and 1995

Year	Male' island			Atolls			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
1985	1726	59	1785	788	235	1023	2514	294	2808
1995	2986	249	3235	1496	575	2071	4482	824	5306
% increase	73.0	322.0	81.2	89.8	144.7	102.4	78.3	180.3	89.0

Source: Computed by the author

Employment in the trade sector increased between 1985 and 1995 from 2,808 to 5,306 persons (see Table 11-6). The most significant of this increase is the rate at which women’s participation in employment in this sector increased. As expected, the increase in the participation of females in the trades sector is more pronounced in Male’ island than in the atolls although the increase in the rural areas was also high. The overall increase in trade sector employment during the 10-year period appears to have occurred at the very top-level occupations.

The proportions of managers and corporate managers grew from nearly 15 percent of total employment in the trade sector to almost 29 percent (see Table 11-7). This is reflective of the emergence and growth of new businesses during

this period. The increase is significantly higher in the rural areas compared to Male' island. This reflects, to a great extent, the growth of mostly retail trade outlets in the rural areas and the increase in trade within atolls, between atolls, and between the rural atolls and Male' island. The decline in the proportion of persons in elementary occupations corresponds with the growth of expatriate employment in such occupations in the country (see Chapter 7).

Table 11-7: Percentage Distribution of Trade Sector Workers by Occupational Category, Maldives, 1985 and 1995

Occupational category	1985			1995		
	Urban	Rural	Total	Urban	Rural	Total
Managers	15.6	12.8	14.6	24.4	35.6	28.8
Professionals and associate professionals	8.1	3.1	6.3	11.0	7.0	9.5
Shop sales personnel	57.7	70.0	62.2	35.7	44.7	39.2
Sales and services, elementary occupations	10.3	8.4	9.6	10.1	4.4	7.9
Others	7.6	5.4	6.8	14.4	5.8	11.0
Not stated	0.7	0.4	0.6	4.3	2.4	3.6

Source: Computed by the author

Formerly, the private sector has not contributed to the development of human capital needed for the national workforce in any significant way. In fact, the need for investing in human capital development was not felt by the private sector. Like the overall economic structure, the diversification of the trade sector in recent years have instilled the need for more skilled human capital in the areas of accounting, management, marketing and other business activities in the trade sector. With large numbers of secondary school graduates leaving schools each year, the basis for specialised training in these fields is in abundance. Some private sector enterprises are now making initiatives to invest in the development of human capital needed for the development and strengthening of their businesses. A highly significant move was made in this direction by one of the leading trade and tourism businesses in the country, recently, by setting up a scholarship fund to finance overseas university studies for local students (Haveeru Daily Online, 1999).

11.2.4 Transport and Communication

11.2.4.1 Transport

Being a nation of islands, the main form of transport within the country has been by boat. As a result of this, Maldivian boat builders have mastered the

craft of boat building to a level of perfection that has attracted praise of eminent foreigners who visited the Maldives, such as the famous Norwegian archaeologist Thor Heyerdal (1982).

Due to the lack of inter atoll trade⁴⁵, and hence a lack in demand for inter-atoll travel in the past, almost all traffic from the atolls have operated between the island of origin and Male' island. An established system of regular transport between most of the islands and Male' island has been virtually non-existent, although the average waiting time for one to catch a vessel to either travel from another island to Male' island or from Male' island to a particular island, unless in times of extremely bad weather, does not exceed more than a week.

With the growth of tourism in the country, high-speed motorboats of varying sizes have appeared on the transport scene in a big way. However, this development in the transport sector is only marginally beneficial for the local population, as these high-speed boats are mainly used for the transfer of tourist between the airport and their island resorts. For those islands that are located close to tourist resort, the operators of these transport services arrange transfer of islanders whenever the carrying capacity permits. In many instances these transfers are provided either free of cost or at a minimal charge for the locals.

Maldives has established a fairly effective national shipping line during the 1960s that has helped the country to overcome several developmental obstacles that are created by its remoteness from the main trade routes of the world, which would have otherwise left the country at the mercy of foreign shipping lines (see Chapter 2). More recently, the private sector involvement in the international shipping business has grown. In fact, the majority of ships that call at the international seaport at Male' presently are locally owned and registered (Ministry of Planning, Human Resources and Environment, 1998).

Since the initial establishment of a regional airport in Hadhdhummathi Atoll in the mid 1980s domestic air transport has expanded significantly in the

⁴⁵ Almost all atoll products are marketed through Male' island, although there appears to be a growing trend in inter island and inter atoll trade.

Maldives. In 1997 there were four regional airports and one international airport in operation in the country, with a total volume of passengers in the domestic operations amounting to 278,738 and the total volume of international operations amounting to 994,728 (Table 11-8).

Table 11-8: Passenger Movement at Male' International Airport, 1997

Flight type	Arrivals	Departures	Transit	Total handled
International	447,823	443,311	103,594	994,728
Domestic	137,120	141,618	-	278,738

Source: Statistical Yearbook of Maldives, 1998.

The growth in the importance of the transport sector for the economy of the Maldives can be seen from the growth of the employment of Maldivians in this sector over the period 1985 to 1995. As shown in Table 11-9 the population employed in transport and supporting activities increased by 79 percent between 1985 and 1995. While the proportionate increase was highest in air transport due to the small numbers of employed persons in this category in 1985, the absolute increase was highest in sea transport. In 1985 and 1995 sea transport shared the highest percentage of employed persons in the transport sector. However, comparison of the percentage distribution by type of transport between 1985 and 1995 indicate the rapid growth of air transport and travel agencies and activities supporting transport during this period.

Table 11-9: Population Employed in Transport by Sector

Sector	1985				1995			
	Urban	Rural	Total		Urban	Rural	Total	
			Persons	Percent			Persons	Percent
Land transport	379	46	425	12.9	486	141	627	10.7
Sea transport	918	1396	2314	70.3	1797	1709	3506	59.6
Air transport	12	3	15	0.5	333	27	360	6.1
Travel agencies and activities auxiliary to transport	303	236	539	16.4	1071	323	1394	23.7
Total	1612	1681	3293	100.0	3687	2200	5887	100.0

Source: Computed by the author from census data

Apart from the domestic air services to the four regional airports, the use of sea planes and helicopters to transfer international tourist passengers between the airport and distant tourist resorts were introduced and expanded during the

1990s. This component of air transport probably contributed significantly to employment in this sector during the 1990s.

11.2.4.2 Communication

Perhaps the most important component of development infrastructure in the modern day is communication. The indispensable role of communication in socio-economic development is evident from the revolutionary growth in businesses through out the world and across continents that has accompanied the astounding advances made in communication and information technology. The significance of the role of efficient communication for the socio-economic development of a people cannot be more vivid than in an island nation of widely scattered population settlements such as those of the Maldives. However, the heavy cost of providing the initial infrastructure has meant that the communication sector has been one of the least developed and hence a persistent factor in the socio-economic disparities between Male' and the atoll populations and a major drawback in forging some essential linkages between Male' island and the other islands of the Maldives.

Male' island, the nation's business and administrative capital and the hub of the country's link with the rest of the world, first established satellite communications with the outside world in 1977. The initial link was made by setting up a satellite earth station in Male' island. Due to the lack of local expertise to run such an operation, the initial running of this facility was awarded to the British telecommunications company Cable and Wireless Worldwide P.L.C., under a sole rights agreement with the Government of Maldives (The World Bank, 1980). This arrangement has since evolved into a joint venture company that was named Dhiraagu P.L.C with 55 percent shares being owned by the Maldivian Government and 45 percent by the Cable and Wireless P.L.C. A significant feature of the newly formed company was that it consisted of mainly local staff.

At the beginning of tourism in the Maldives, all communications between the resorts and their managements in Male' island were conducted through walkie-talkie, which were later on upgraded to VHF radio-telephone (The World

Bank, 1980). Until the 80s most inter island communication was also conducted by walkie-talkie, with the only contact being with the atoll capital and other nearby islands. All communication between the atoll capitals and Male' island were conducted via HF transceivers, which often failed due to problems of power supplies (Dhiraagu, 1999).

Although the first telephone system was introduced in Male' island with a 300 line manual exchange in 1968, it was not until the 1990s that telephone links were first introduced into the atolls. The first telephone links outside Male' island atoll were established in Ari atoll with the establishment of the Second Tourism Zone in that atoll. Currently 111 out of the 200 inhabited islands of the country are connected to the national telephone network, providing access to telephone for about 77 percent of the total population. By the end of 1999 Dhiraagu envisages to provide telephone access to 100 percent of the population (Dhiraagu, 1999).

While these advances are being made in linking the islands of the Maldives with the national telecommunications network, postal services are more at the mercy of the irregular sea transport that exist between the atolls and Male' island. The exceptions are those islands that are located in close proximity to either a regional airport or one of the air links in the tourism zones.

There is no direct inter atoll or inter island postal service that bypasses the central postal authority in Male' island. All mail from the inhabited islands of the Maldives are first forwarded to Male' island, where they are sorted and re-directed to other atolls and overseas. For an island nation like the Maldives, this is probably the most efficient and cost effective option for postal communications. The atoll postal system was introduced only during the 90s. It was established through a system of Agency Post Offices run by private businesses in the atolls in arrangement with the Maldives Post Limited, a fully government owned company.

11.3 Summary and Conclusions

Since historical times, the economy of the Maldives has remained simple, with most males involved in fishing and most females involved in the manufacture of coir rope, thatch and mats. Major exports were limited, both in terms of products and markets. It remained, more or less so, until, during the 70s, when disruptions in its export of fish prompted the government to look for alternative markets and diverse methods of marketing its only abundant natural resource, fish. Steps taken in this direction led to the modernisation of the fishing industry and growth in production and exports of fish and fish products. Modernisation of the fishing fleet, through the mechanisation and remodelling of the fishing *dhoni*, brought with it, complementary developments in inter atoll transport, providing easier access for the islanders to the markets in Male' island.

Changes in the fisheries sector is believed to have brought about a rapid decline in the numbers of economically active females, by moving the processing of fish away from home to factory based processing and export of frozen fish direct to overseas markets. While several women got relegated to the not economically active category, to some extent, this outcome can be regarded as positive for two reasons. Firstly, by reducing the likely impact on the health of women caused by the environment in which they work in fish processing and the long hours of work, and secondly, by being able to have more time to relax and being able to devote more quality time to the care of their children, which is so crucial for human capital development (Leibowitz, 1974; Murnane, *et. al.*, 1981; Hanushek, 1992).

There are, however, two areas of concern arising from the recent developments in the fisheries sector. The question of sustainability arises with the rapid growth in the export of live and frozen grouper fish as the highly attractive financial gains from this particular type of fish have prompted large amounts of catch all year round. The most vivid indication of over fishing of this type of fish is the difficulties expressed by some in getting reasonable sized fish suitable for export. The other area of concern is the recent granting of fishing

rights to foreign companies to fish in the exclusive economic zone (EEZ) of the Maldives. Considering that the country faces the problem of foreign poachers intruding into its EEZ and the inability of the country to police its territorial waters, such licensees are likely to take advantage of their permission to fish in the EEZ of the Maldives. Experiences of other countries show evidence of over fishing if there is inefficient regulation (The World Bank, 1996:50).

Modernisation of the fisheries sector occurred almost concomitantly with the introduction and growth of tourism. Fuelled by the tourism sector demands and probably the flow of tourism revenue to the households, trade, construction and transport sectors grew, providing employment opportunities for the growing population. Rapid growth in these sectors and the overall economy is reflected in the GDP. Between 1988 and 1997, the GDP at current prices grew nearly five fold.

In spite of rapid economic growth and the compositional changes in the GDP that has been brought about by the increasing importance of some secondary and tertiary sectors of the economy, fisheries sector still continues to be the major employer for rural males, while, production of garments and related activities continue to be the main source of employment for rural females in the Maldives.

At first impression, it seems that a large proportion of the employed females are in the garments factories that have been set up around the country. Close examination of the status of employment of women working in this area reveals that most of them are own account workers working from their homes. Home-based production of garments is an area that a lot of rural females currently see as a suitable form of employment for females in the rural Maldives (Qualitative interviews conducted by the author in Maradhoo-Feydhoo island, Addu atoll, 1999). However, many of them lack access to machinery, training and even markets. Lack of easy access to markets appears to be a major drawback for the development of agriculture and cottage industries in the rural islands of the Maldives.

Where there have been shifts in the economic structure of employment, differential patterns exist between males and females; and to some extent, between the different age groups. While male employment shifted towards secondary and tertiary economic sector occupations, female employment moved mostly towards social sectors with the movements towards tourism and other modern sectors and the human capital sectors (health and education) strongest among the youngest age groups of the labour force. Although the traditional rural sectors appear to be the most areas of the economy that are negatively affected by this trend, public sector employment also appears to be less attractive for the younger cohorts of the workforce. It appears that these shifts are the results of increasing opportunities for better paid, higher status occupations in the growth sectors, especially for the male workforce, and the increasing numbers of persons of both sexes completing higher levels of schooling, increasing their aspirations for higher paid jobs in the private sector. In the private sector, those occupations that were less attractive for Maldivians were filled in by expatriate workers and in the public sector the transformation has been from males to females, as more males seek employment in the private sector, while females, having limited access to work in the tourism sector, find the opportunities in the public sector more attractive.

Participation in tourism and related sectors provide employment for urban, as well as atoll populations. However, due to the location of tourism zones around Male' island, there has been a lot of restrictions for atoll populations, especially family persons, to work away from their families for long periods of time. Populations in inhabited islands located close to tourist resorts benefit greatly from the resorts in several ways; getting opportunities for permanent employment close to home, getting access to contract work on the resort island as masons, carpenters and fishermen, and getting access to convenient transport to Male' island on their transfer vessels.

While the majority of jobs held by Maldivians in the resorts, except at the top management, have been mostly of elementary levels, there has been a significant increase in Maldivian participation in professional and managerial jobs in the recent years and a marked decline in the proportions employed in

elementary occupations. This trend is not only observed in tourist resort employment but also in other areas of the economy as well.

Although the tourism industry in the Maldives, from its very inception, has been firmly in the hands of the Maldivians, difficulties in getting investment financing for resort construction and management have meant that several Maldivian resort owners have had to get into financial arrangements with overseas tour operators from the sending countries in Europe. Indirectly, such arrangements have transferred a lot of control of the tourism revenue to the overseas investors resulting in the large portion of the revenue being retained by the tour operators in the sending countries. In some cases, such arrangements have even resulted in the transfer of management rights of the resorts to the foreign investors. Recently, there has been an increase in the ownership of Maldivian tourist resorts by foreign parties, and it is likely that this trend will continue, gradually transferring the control of the Maldivian tourism industry from local hands to foreign hands.

With the constant evolution of the fishing dhoni and the increasing ability of local fishermen to exploit the vast areas of sea that surrounds the islands of the Maldives, it is expected that fisheries will continue to be the main sector of employment for Maldivian males in the foreseeable future. However, tourism sector employment is likely to increase as tourist resorts are established in the outer atolls making them more easily accessible for the island populations.

The expansion of tourism and other modern sector activities are becoming more possible with the development of the communication between Male' and the atolls. These developments are likely to minimise the negative effects of isolation and dispersion that has been a major obstacle for the development of the modern sector industries such as tourism in the outer atolls of the country. With the increasing accessibility it is also expected that the participation of females in the tourism and other modern sector employment will increase.

Developments in communication will not only be beneficial for the creation of employment opportunities in the atolls. They will also play a crucial role in

closing the rural urban gap in the delivery of services such as schooling and health care through the use of computers in classrooms and tele-medicine in rural health posts⁴⁶. Such developments are already taking place in some islands of the Maldives, highlighting the importance of efficient communication for human capital development and economic growth in a small island state like the Maldives.

The benefits of macro economic development appear to have its direct and indirect implications on the urban and rural populations of the Maldives; directly through the ability of Maldivians to participate in various economic activities and the increasing productivity of the fisheries sector, and indirectly through the increased ability of the public sector to provide the basic social and economic infrastructure that is essential for the development of the island populations.

⁴⁶ This observation is based on news articles published on the Haveeru Daily Online (<http://www.haveeru.com.mv>), several issues.

Chapter 12: Macro-level Synthesis

Analysis of the levels, trends and differentials in the demographic, economic and human capital variables provides a clear understanding of the socio economic developments and demographic changes that have taken place at the macro-level in the Maldives. In analysing the trends attempt was made to go back as far as the available data permits, mainly in order to get a clearer understanding of the stage of development that the Maldives has reached and the time frame within which most of these demographic and socio-economic changes have occurred.

Review of historical accounts and early censuses have shown that in spite of its geographical remoteness and the dearth of natural resources, Maldives has always sustained economic and political independence and relatively reasonable levels of social development and unity. These factors have obligated the people of the Maldives to be entrepreneurial in order to survive in an environment with limited resources and free from colonial dependency. These qualities have proved to be the key assets that provided a head-start to national economic development, when new opportunities opened up with the introduction of tourism in the country during the early 70s.

Mortality decline and gradual acceleration of population growth occurred more or less synchronous with almost radical changes to the economy that induced levels of economic growth that the country has never witnessed before. The economic structure transformed from an economy almost wholly dependent on a primitive fishing fleet, home processed fish products and a highly restricted export market, to one that is largely financed by a modernised and expanded fisheries industry, a booming tourism industry, and more diversified markets, within the past 30 years.

Fertility declines have been observed among the urban population and most rural populations of the Maldives during the period 1985 – 1995. Nine atolls, noticeably five of them clustered together in the south central region of the archipelago, and the other four atolls located in the central and northern regions

experienced fertility increases during the ten-year period. It is possible that these increases noticed at the atoll level are caused by fertility patterns in some islands within these atolls. Micro-level demographic and socio-economic factors are likely to be responsible for these differences.

The observed fertility declines may be attributed to shifts in the patterns of childbearing among women, shifts in the age structure of the population, and delayed age at first marriage especially among the younger cohorts entering the reproductive age groups. The observation of considerably lower fertility by several socio-economic characteristics of females in the urban areas compared to rural atolls suggests that several factors may be involved in the recent fertility decline in the Maldives. Among these, five key factors seem to be of special significance. Firstly, increasing levels and accessibility to schooling for the urban and rural populations, especially girls have increased the age at first marriage. This has had a delaying effect on their exposure to conception.

Secondly, the changing attitudes towards the use of modern contraceptive methods to limit and space childbearing appear to be significant factor. Awareness programmes primarily targeted to alleviate the high levels of infant and childhood mortality and maternal mortality may have probably played an important role in increased contraceptive use.

Thirdly, in large population centres in the urban and the rural areas, the pressures of population densities and shortages of housing land have created some urban problems such as overcrowding in homes and social service institutions, depletion of the fresh water aquifers, and waste disposal. These pressures coupled with the increasing costs of providing human capital inputs for the children are likely to be responsible for prompting people to think rationally about fertility regulation and family size control.

Fourthly, starting from the introduction of a child spacing and maternal and child health programme during the 80s, the government has recently been more explicit about the issues of population growth and the need to control fertility in order to achieve sustainable development and higher standards of living. To

some extent, the incentives for community achievements in fertility control and awareness programmes on population matters through the mass media may have supplemented the more tangible effects of population growth that are being observed by the people.

The Fifth, and by far the most important factor seem to be education. Mass education has been found to be one of the most important determinants of the timing of fertility in developing countries (Findlay and Findlay, 1991:22). Long before fertility levels began to decline, mortality has been declining steadily. In spite of rapid declines in mortality, there has been little progress made in improving the nutritional status of the people. Of special significance is the nutritional inadequacy of women and children because of the implications for the quality of human capital. Nutritional deficiencies in the Maldives may be attributed to dietary habits rather than poverty because as the author has consistently observed that although vegetables and fruits are easily and freely available in their communities, people are not in the habit of regularly including them in their meals.

With fertility levels declining in the recent years, the age structure of the population is set to change in the future. Population projections made on the basis of declining mortality and declining fertility have shown that there will be a major shift in the age structure from a young population to a more mature population. Implications of such a shift on the labour force is most appealing as these populations trends are likely to create the size of labour force that the country so badly needs for economic expansion, at the same time reducing the dependency burden of the population.

If the prospective numbers that will be joining the labour force are to be adequately skilled to replace the existing expatriate labour force, at least in the skilled and semi-skilled occupations, and at the same time cater for the increasing skill demands of the growing economy, the projected figures of the school age cohorts throughout the projections appear daunting. Substantial investments will be needed in providing the needed classroom space and preparing the human capital needed for the additional classrooms at all levels

of schooling. These age-structural transformations are likely to be affected by the high population momentum created by high fertility and declining mortality in the past, and the rapid decline in fertility that has begun during the period 1985 to 1995. The effects would be in the form of population waves created by disordered cohorts, as abrupt declines in cohort size and large numbers of women in other cohorts pass through the various life-cycle stages of schooling, labour force entry, childbearing, and old age. (Pool, 1994, 2000). The population projections suggest the effects of such disruptions.

In the urban area, the effects of high fertility and declining mortality have been further aggravated by the heavy flow of internal migration from the rural areas imposing heavy strains on the infrastructure and services. However, population growth and internal migration has a major beneficial effect on the economy by creating an economy of scale that is conducive for the growth of various economic activities in the urban area. Growth of the economy, although it is concentrated in the urban area has created attractive employment opportunities for the rural populations and competitive markets for the atoll products, indirectly benefiting the development of the rural households. However, the concentration of the economy in the Male' region has, by virtue of societal factors, left large numbers of working age populations, namely women, out of the economically active workforce.

As primary and secondary education spreads throughout the country, males are moving away from menial occupations to professional and managerial occupations and from the public sector to the more lucrative private sector employment. Females are replacing males in the entry-level jobs in the public sector. Employment in the social sectors is also becoming an attractive area for female population. In fact, parents and the society at large encourage girls to pursue careers in either teaching or health care professions after they graduate from secondary school.

Factors such as increasing levels of schooling, abundance of employment opportunities in the public and private sectors, and the low social status associated with certain types of menial elementary occupations, are likely to be

the causes of a lack of interest among locals in such elementary occupations. Large numbers of expatriates have replaced Maldivians in these occupations during the past decade. Factory oriented occupations, which are new to Maldivians, has also failed to attract Maldivian workers and thus has had to rely on imported expatriate labour for their operation.

In other areas where expatriate employment is high, it is the shortage of local skills rather than interest that has attracted expatriates to these occupations. These are often professional jobs that are relatively well paid. The tourism industry is one such area where expatriates dominate the skilled occupations. At present, the most negative impact of this is the significant flows of the national income as remittances abroad. Since these jobs are often the most lucrative, they may also be the more desirable to be replaced by Maldivians when they acquire the necessary levels of skills that are demanded by these occupations.

The garment industry, almost wholly owned and operated by foreign investors, is an industry specifically targeted for women's employment. However, due to socio-cultural factors, married local women and local women with children are unable to participate in this industry. The result is that garment processing factories operating in different parts of the country may be of little benefit for the local populations.

As the economy expands further and the demand for higher qualities of social services increases, so will the demand for the quality and quantity of human capital. The changing dynamics of the age structure ensures that adequate numbers of locals will be available to cater to such demands. The more perturbing question is whether these numbers would be adequately qualified to handle the human capital demands of the evolving labour market. In order to assure this, it is important to understand the interlinkages between population growth, human capital and development at the micro-level. This will be the aim of the next part of this thesis. Since employment provides the link between economic growth and human capital, the factors associated with employment and unemployment are also important.

**PART C: DEVELOPMENT AT THE MICRO-LEVEL:
DRIVERS AND IMPACTS**

Chapter 13: Description of Analytical Variables

In Part B of this thesis we provided an analysis of the levels and trends in fertility and family formation, mortality and health, migration, human capital, and development in the Maldives in the past, with particular focus on the intercensal period 1985 to 1995. It has been shown that the effects of past trends in mortality and fertility have resulted in a young age structure although recent data suggests that the base of the population age structure have started to narrow. The impact of the existing age structure on the present and future human capital development programmes based on population projections proposed in this thesis has also been appraised. The impacts of the large numbers of secondary school age population that arrive on the labour market have also been discussed. In order to adequately address the issues of population change, human capital and economic development at the macro-level, it is necessary to understand the various socio-economic and cultural factors that are associated with these variables at the micro-level, for it is the actions of the individuals and families at the macro-level that leads to macro-level issues, their problems and solutions. The present part (Part C) will be concerned with a micro-level analysis of the links between population, human capital and development in the Maldives.

The study of inter-linkages between population growth (fertility), human resources (education, and as the link between human capital and development, employment), and development (index of the household level of development) will be based on multinomial logistic regression analyses of the relationships between these variables as dependent variables and several independent variables. Analyses of the inter-linkages are performed through several regression equations, which study how and to what extent each of the above factors are affected by the effects of different socio-economic and demographic variables. Dependent variables representing human capital, population growth, and development inter-relationships and the proposed independent variables that, from the review of literature (Chapter 3), are known to influence these dependent variables are given in Table 13-1.

Table 13-1: List of Variables in the Regression Analyses

Dependent variables	Independent variables
a) Fertility: Children ever born to a woman (Controlled for broad age group of women)	Current age of woman Age at first marriage Type of household Level of HH development (IHD) Number of persons married Educational attainment Activity status Migrant status
b) Education: School attendance (ages 15 to 17)	No. of household members under 15 Level of HH development (IHD) Household type Education of household head Activity status of head Sex of household head Sex of child Presence of other children in household Migration status of child
c) Employment: Labour force status of head (Controlled for age and sex of household head)	No. of household members under 15 Location of island in relation to tourism zone Nature of island economy Type of household Educational attainment Marital status No. of household members economically active Labour force status of spouse of head
Labour force status of child (Controlled for age and sex of child)	All of the above excluding the last two variables
d) Development: Index of Household Level of Development (IHD) (Controlled for age and sex of household head)	No. of household members under 15 Nature of island economy Location of island in relation to tourism zone Type of household Education of household head Number of economically active members Lifetime migration status of household head

Many of these are standard indicators from information collected in the census, such as, activity status, educational attainment, and demographic characteristics of household members. However, some variables are more

complex and are computed by combining different variables from the census data and other variables from sources other than the census data. These more complex variables need elaboration on how they were derived.

This chapter discusses the variables used in the multivariate analysis and how the more complex of these variables were developed. The chapter will close with an introduction of the methodology adopted in analysing the interlinkages between development, human capital and fertility at the level of the household, which will be the focus of the rest of the chapters in this part of the thesis.

13.1 Index of Household level of Development (IHD)

A composite index of household level of development (IHD) is computed from information on the quality of housing structure and availability of certain household possessions that reflect the level of household affluence such as; television, video player, refrigerator, washing machine, radio, and stereo. This index, which will be referred to as Index of Household Development (IHD), has been adapted from Kishor and Neitzel (1996:6) who developed an Amenities and Possessions Index (API) for the purpose of studying women's status.

The API was based on an individual's access to the basic amenities of toilet facilities, water, and electricity, and to four consumer durables, radio, television, refrigerator, and car. Individuals were assigned to one of the four index values, ranging from high API to low API, according to whether their household has the specified combination of basic amenities and consumer durables.

The index of the household level of development (IHD), in addition to information on household possession of consumer durables, incorporates information on the quality of material used for the construction of the dwelling unit of the household. It does not, however, include information on the possession of vehicles of any type, as data on household possession of vehicles is not available from the census or any other sources.

The census of 1995 collected information on the materials used for the construction of houses and availability of seven different consumer durables by the members of the household. In addition, information was also collected on the type of drinking water and type of cooking fuel used, but was not used in computing the IHD. The variables used in computing the Index of Household level of Development include; materials used in the construction of the walls and roof of housing units and the six of the seven different consumer durables (radio, television, stereo, video, washing machine, refrigerator). The consumer durable that was excluded from the index is sewing machine as it is more likely to be used for income earning purposes than any of the others. The excluded categories, while being important aspects of household health and wealth, in the present context are not likely to provide a true reflection of the household level of socio-economic development for two reasons.

Firstly, most islanders have access to rainwater from the government installed water tanks in public places on the islands. Even those who have their own water tanks may sometimes have to resort to drinking well water when long spells of dry season dry up the small rainwater storage tanks. Secondly, the type of fuel used for cooking, especially in the rural islands of the country depend on the availability of free firewood, either from the island or from a nearby, uninhabited island.

The 1995 census data set are used for the development of the IHD. A frequency distribution of households by quality of housing revealed a significant proportion of households (7.9 percent) for which information on housing quality was missing. A close examination of the cases for which information on this variable was missing showed that the problem was a simple one – when more than one household was found in a given dwelling unit, information on household characteristics were recorded only for the first household while a separate household number was assigned for each

household⁴⁷. It was found that for all cases where information was missing were households other than the first household in multi-household dwellings. The missing information was imputed using the information provided for household number one. This is justified by the fact that it is fairly common, especially in the more densely populated islands of the Maldives, for dwelling units to be shared by more than one household.

It is likely that the cost of construction of the housing unit and some consumer durables used may be shared by all the households of the same dwelling unit while, in fact, the cost of these may be born by one or more of the households. This would cause an upward shift in the proportion of persons in a given level of household level of development. However, this may not be a totally negative effect as the index of household level of development is concerned with the accessibility of households to a given level of living.

Since the information used in computing the index of development is at the household level, all institutional households and mobile dwellings such as sea going vessels were excluded from the data set. In addition to this, all households that consisted of only foreigners were also excluded as such households are beyond the scope of the present thesis. All those households for which information on housing quality was 'not stated' as opposed to 'missing' were also excluded. The original data set contained a total of 34,427 households. The modified data set included 31,484 households.

The development of a composite index of development at the level of the household will be based on a 10 percent sample of all households included in the modified data set. The method of selection of the sample is simple random sampling using the SPSS for Windows (version 9.0.1) for the selection. The total number of households thus selected was 3168.

47 A household was defined as a group of related or unrelated persons sharing the cost of all meals and living in the same dwelling unit (Ministry of Planning, Human Resources and Environment, 1995)

The original classifications of materials used in the construction walls, roof, and floor of the dwelling units were sometimes overlapping. For instance, walls built of cement blocks and walls built of coral stone were classified into two separate categories although they are generally perceived to be of similar quality. Such categories were reclassified due to the small proportions in some of the categories. Weights were assigned to each category in order of their relative quality. The detailed procedure followed in arriving at the Index of Household level of Development (IHD) shown in Table 13-1 is presented in

Table 13-2: Categories of the Index of Household Level of Development

Index	Categories
1	High
2	Medium
3	Low

Since there are significant differences in the levels of accessibility to the various social and economic services between Male' island and the rest of the country, discussions of the following variables employ a 10 percent sample of the all households outside of Male' island. Exclusion of Male' households for the present purpose is important in understanding the effects of factors such as the distance from tourism zone and the nature of the island economy in relation to the household levels of development.

13.2 Distance from Tourism Zone

The tourism zone in the Maldives is located in a clearly defined area - in the atolls surrounding the capital island, Male'. More recently, however, new resorts are being opened in the atolls that in the present categorisation are either 'outside zone' or 'distant from zone'. Since these new developments have occurred after 1995 the effects of these new tourism zones will be ignored for the present study.

It would seem that, being located either in a tourism zone surrounded by tourist resorts, or being located close to a tourism zone would enable the population of

an island easy access to salaried employment and contract work on the tourist resorts, and also be able to attract tourists on excursion trips to their islands, encouraging the growth of tourism oriented retail trade and services providing more revenue for the inhabitants. Being further away is likely to restrict such opportunities. It would, therefore, imply that the proximity of an island to the tourism zone is an important indicator of the extent of the participation of its people in tourism sector employment. A variable is computed to indicate whether an island is 1) in the tourism zone 2) adjacent to a tourism zone 3) more distant from a tourism zone, or 4) physically very far from the tourism zone as the southern most four atolls are.

Being a measure of the physical proximity to the tourism zone, this variable is purely based on the geographic location of a given atoll on the map. No distinction is made between the locations of different islands within a given atoll reef, although the distances between the nearest tourist resort and the island may vary considerably from island to island in one atoll. This is especially true in atolls that are adjacent to the tourism zone atolls.

Table 13-3: Categorisation of Atolls in Relation to Tourism Zones

Categories	Number of Atolls	Total	
		Population	Percent
1 Within zone	3	86149	35.2
2 Periphery of zone	4	21593	8.8
3 Outside zone	9	91912	37.5
4 Distant from zone	4	45160	18.4
All categories	19	244814	100.0

It can be seen from Table 13-3 that, over a third of the population of the country resides in the tourism zones. However, it should be noted that this proportion includes the population of Male' island, which has not only easy access to tourist resort employment, but also to all other sectors of the economy.

Validity of classifying the islands of the Maldives into the above mentioned categories could be seen by cross tabulating the nature of island economy by the IHD. Table 13-4 shows that there is a significant pattern of relationship

between the level of household development and the location of the island in terms of the administrative atoll to which it belongs. What is apparent from the distribution of households in relation to the tourism zone is that there are particular atolls that have benefited more from the development of tourism in the Maldives.

Table 13-4: Distance From Tourism Zone by Index of Household Level of Development (IHD)

Distance from tourism zone	Index of Household level of Development (IHD)				
	High	Medium	Low	Total	Total
Within zone	28.2	25.7	46.1	100.0	245
Periphery of zone	18.1	15.6	66.3	100.0	282
Outside zone	10.9	12.2	77.0	100.0	1371
Distant from zone ⁴⁸	20.6	17.2	62.2	100.0	675
Total	15.9	15.2	69.0	100.0	2573

13.3 Nature of Island Economy

Inhabited islands of the Maldives, each being a self-contained population settlement, have displayed a form of identity in terms of the occupational specialisation of its people. Some islands are known for their fisherman, while others are known for a particular kind of craftsmanship. It is, therefore, vital that in a study of population, human capital and development inter-linkages, a variable that indicates the nature of an island's economy be included. The nature of an island's economy or the levels of income remitted to the island families depend on the industry of employment of individuals of those islands.

This variable is computed from the information on the industrial category of employment of individuals according to their place of birth. The place of birth, rather than the place of residence at the time of the census, is taken to ensure that all those who belong to a certain island, but lived elsewhere at the time of the census to sell their skills, are also considered as part of a particular island's community contributing to its economy. Classification of people by their place of birth also captures the effect one's birthplace has on the kinds of skills possessed by the person later in life, irrespective of where the person is

⁴⁸ The higher IHD for distant atolls is explained by the high participation of the males of these atolls in the tourism sector employment and before that at the Royal Air Force Base in Gan (Addu).

employed. It has been discussed in the preceding chapters that there is a high level of internal migration, mostly by male members of island households, to work in urban sectors such as tourism, trade, construction and other related areas. These migrant workers remit most of their income to their families in their home islands. These remittances are made in cash, in the form of consumption goods, and in the form of capital goods for housing; all of which enrich the lives of the island populations. Even if one is settled in the urban area, most families are likely to keep in touch with their extended families in their home islands continuing to provide financial support to them although this may not always be the case. Similar situations have been observed in other small island countries of the Pacific (Bertram and Watters, 1985, 1986; Connell, 1990). In spite of this, the bias introduced by considering people by their birthplace is likely to introduce some bias into this variable. Hence, the findings based on the basis of this variable should be viewed within the broader picture provided by the qualitative studies conducted by the author.

From the macro-level analysis of employment data it was found that, while a substantial number of island populations reported employment in the manufacture of apparels and textile goods, most of them were female own account workers working from their own homes. The incomes they receive from these activities are only supplementary to the incomes received by the males working in areas such as fishing and tourism. When employed population is classified according to the primary economic activity and island of birth, the most striking factor is the large proportions of persons involved in fisheries, and manufacture of apparels, straw, paper and wood products. Although some individual families in some communities derive good income from such activities, these activities do not create much income at the island level. Hence, the primary industries that employed males in 1995, which are tourism and fisheries, are taken as the major determinants of the indicator of the nature of island economy.

However, for the purposes of this analysis, an island is identified according to the most dominant primary occupation of its economically active population and are distributed into 5 categories: 1) tourism; 2) fisheries; 3) tourism and

fisheries; 3) agriculture; and 4) no particular dominant category identifiable. Several factors are considered in determining the categories.

Those islands where over 50 percent of the employed males were in the tourism sector are considered to be purely tourism economies; three islands were identified in this category. Those islands with 40 to 50 percent of employed males in the tourism sector are considered as highly tourism oriented economies; four islands were identified in this category. Those islands where the proportion of employed males in the tourism sector was between 20 to 40 percent while employment in the fisheries or other sectors remained considerably lower are classified as tourism oriented economies; 15 islands were identified in this category.

While the distinction has been made in the dominance of either tourism sector employment or fisheries sector employment in categorising islands into two distinct groups, some islands exhibit more or less equal importance in these two sectors. These islands are grouped into a third category – tourism and fisheries based economies; nineteen islands were identified in this category.

Considerable numbers of islands were identified as predominantly agricultural islands. These islands are those where the highest proportions of employed males and females were reported to be in agriculture more than any other sector of the economy. Careful attention was given to select those islands that reported at least 20 percent of employed males and at least 50 percent of employed females in agricultural activities, while the rest of the employed population were distributed across the rest of the sectors of the economy; nine islands were identified in this category.

After excluding these islands from the list of all islands, the rest were classified according to their importance in fisheries. This group forms the second category. However, due to the wide range of the percentage of labour force engaged in fishing in different islands; ranging from 87 percent to under ten percent, these islands are grouped into three categories according to the

proportion of males engaged in fisheries sector employment: 1) 50% and over; 2) 35 –49%; 3) 20-34%.

Those islands where no single sector dominated the economy were classified as a fifth category. It should be noted that the urban population of Male' fall into this category. This was expected as the urban nature of the economy in Male' offers a more diverse range of skills and jobs for employment.

Table 13-5: Nature of Island Economy by Index of Household Level of Development (IHD)

Nature of island economy	Index of Household level of Development (IHD)				
	High	Medium	Low	% Total	Total (n)
Tourism	25.5	23.2	51.3	100.0	530
Tourism and fisheries	15.0	18.8	66.3	100.0	160
Mixed	13.4	13.0	73.6	100.0	440
Fisheries	13.4	12.5	74.1	100.0	1331
Agriculture	9.8	12.5	77.7	100.0	112
Total	15.9	15.2	69.0	100.0	2573

It can be seen from Table 13-5 that the relationship between the nature of island economy as defined above and the level of household development (IHD) is generally in the expected pattern. Once again the percent distribution of households suggest that employment in the tourism sector enables households to improve their quality of life more than any other economic activity. It can also be seen that those islands that are unable to participate in tourism sector employment are more likely to have lower levels of household development (IHD). It appears that the islands of the Maldives can be classified into two distinctive groups in terms of economic activities of their inhabitants - Tourism oriented economies and the rest.

The analysis of interlinkages is performed through several regression models. The independent variables and the dependent variables in the different models were presented in Table 13-1. Results of the different regression models are discussed in the following chapters.

The purpose of the analysis presented in the following analytical chapters is not to provide a comprehensive analysis of the determinants of the dependent variables presented in each of the models (fertility, education, employment, development) in the Maldives. Such an effort would be too extensive, given

the complexities of factors involved, as is evident from the theoretical aspects presented in Chapter 1. Rather, the aim is to understand the links between population growth (fertility) human capital (education, and as the link between human capital and development; employment) and development (IHD) and several independent variables that are theoretically linked to these variables to the extent that the available data permits.

Chapter 14: Determinants of Fertility at the Micro-Level

Ever-since the formal link between population and development was first made (Malthus, 1798), fertility has been seen as perhaps the most important factor in the growth of populations. Thus the theories of demographic transition (Notestein, 1945; Becker, 1960; Easterlin, 1969; Caldwell, 1976a, 1980) attempt to explain fertility behaviour of couples as the key demographic factor linking population and economic development. This is not to say that age structural effects are less important influencing population growth.

Using fertility as a proxy for population growth at the micro (household) level, this chapter examines how the human capital and development factors are associated with fertility at the micro-level in the present context. Fertility of a woman is known to be affected by several 'direct' and 'indirect' factors (Davis and Blake, 1956; Bongaarts, 1978; Bongaarts, 1993; Stover, 1998). Indirect factors are the socio-economic and environmental factors of individuals and families, such as education, employment, family type and composition, while the direct factors are the so-called 'exposure factors', 'deliberate fertility control factors' and 'natural factors that are known to affect fertility' (Bongaarts, 1978).

This chapter concerns with socio-economic and environmental factors and some exposure factors affecting the fertility of Maldivian women. The nature of available data limits the number and types of independent variables and the dependent variable in the present analysis. However, the individual level data from the 1995 census provides information on several socio-economic characteristics that are important for fertility, and some demographic variables, which can also be used as exposure variables such as the current age and the age at first marriage of women and the number of different marital partners a woman has had during her lifetime⁴⁹.

⁴⁹The variable used is the number of different persons to which a woman marries during her lifetime. This variable is preferred over the number of times married in the present context because of the high divorce and remarriage rates between the same couple in the Maldivian

While some of the factors such as the number of persons a woman marries and the number of children ever born are 'time varying' factors (mostly dependent on the age of the individual), it is expected that the biases introduced to our estimates due to the age effects on these factors will be minimised by controlling for the age group of women. Separate models for the urban and the rural populations are also likely to minimise these effects (see Cochrane, 1983). Age of women is also used as an explanatory variable in the present models. While the number of children ever born alive to a woman is used as the dependent variable measuring fertility, the independent variables used in the explanation of the levels of fertility of Maldivian women in the present study are; age of a woman at the time of the census, her age at first marriage, household type, level of household development, number of persons a woman has married in her life, level of education attained, her labour force participation, and her lifetime migration status. Due to the retrospective nature of the data used, some of these variables, particularly the last two variables present some problems. For instance, labour force participation being a fairly volatile factor, susceptible to seasonal fluctuations, may not be reflective of the normal status if observed at a given point in time. Similarly, a migrant may have had all her children prior to migration and hence may not at all be affected by her migrations status. The results of our analysis should thus be interpreted with these issues in mind.

The general theories linking population growth, human capital and development have been discussed in Chapter 3 of this thesis. The extensive nature of this thesis does not permit a detailed discussion of the large volume of theoretical literature on the determinants of fertility change (the topic of this chapter) or of any other dimensions of the population growth, human capital and development (the rest of the chapters in Part C). Attempt would be made to provide the major theoretical underpinnings for the explanatory variables used in each model discussed.

Bulatao and Lee (1983) provide an extensive collection of articles on the determinants of fertility in the developing countries. Drawing from these works and other literature, the following discussion provides a theoretical background of the different variables used in the present analysis and fertility.

An increase in the age at which a woman enters her first marital union will, undoubtedly, reduce her total exposure to fertility, having a downward effect on her completed fertility. The fertility transitions in Europe have not shown a significant role of delayed marriage in reducing fertility levels (Watkins, 1981; Dyson and Murphy, 1985). While the fertility experiences of Latin American countries also suggest that, for the region as a whole, nuptiality has not played a significant role in fertility decline (Rosero-Bixby, 1996), Asian experiences suggest that changing marriage patterns may indeed be an important factor in birth rate reduction in these societies (Cho and Retherford, 1973; Mauldin and Berelson, 1978; Smith, 1983; Coale et al., 1979; Kobayashi, 1979; Mosk, 1981; Retherford, *et al.*, 1999).

Another factor that determines exposure to fertility in a society such as the Maldives is the frequency of marital disruptions due to divorce. The effect of marital disruption in traditional third world societies varies greatly, with much of the variation dependent on cultural factors (Burch, 1983). In fact, in some societies a positive association between the frequency of marital disruption and fertility has been observed by Harewood (1984) using data from Guyana, Jamaica, and Trinidad and Tobago (see also Downing and Yaukey, 1979) contend that a woman's fertility is affected by marital disruption through a balance of two counteracting forces: the negative effect of reproductive time lost and the positive effect of remarriage. Their analysis of South American data suggest that in societies with high fertility the frequency of marital disruption and re-marriage would have a pro-natalist effect while in low fertility situations the anti-natalist effect would dominate. In a study of three populations of the Maghreb region of North Africa, Tabutin (1979) found some evidence of a negative relationship between the frequency of divorce and remarriage and fertility.

Turning to the socio-economic factors of fertility, the type of household (nuclear family/extended family) is believed to have an indirect effect on fertility of women. In pre-transitional societies, where subsistence means of production prevail, the flow of wealth is from the younger to the older. This flow is reversed as the economy modernises and the costs of providing education and other services increase, while at the same time the role of children as contributors to household production is diminished, and the net flow of wealth tips from parents in favour of their children (Caldwell, 1976a, 1979, 1981, 1983). Caldwell argued that family nucleation is a key factor in the reversal of wealth flows from the older to the younger thus making lower fertility more economically rational. Thus extended family systems are likely to encourage higher fertility than nuclear family households, if they facilitate early marriage and reproduction and spread the costs and responsibilities of childbearing (Burch, 1983; Nag, 1967, 1974, 1980)⁵⁰.

The most widely documented and perhaps the most important factor of fertility decline in the theories of demographic transition is education (Becker, 1960, 1980, 1990; Becker and Lewis, 1973; Becker and Tomes, 1976; Becker *et al.*, 1990; Willis, 1994; Schultz and Tomes, 1976; Schultz, 1993; Easterlin, 1969, 1975, 1983; Caldwell, 1976, 1979, 1980, 1982). Education, as Caldwell (1980) puts it, can impact fertility in at least five ways: by reducing the child's potential for work inside and outside the home; by increasing the cost of children; by increasing the dependency burden within the families and in societies; by speeding up cultural change; and by changing societal values through westernisation. Improvements in female educational attainment are likely to increase the bargaining power of females in household decision-making. This in turn will have a positive effect on children's welfare and their

⁵⁰ In spite of strong criticisms on the Caldwell's restatement of the transition theory (see chapter 3) it continues to influence research on fertility transition in the developing world (Mundigo 1996; Potter, 1996; Burch, 1983; Smith, 1983; Lloyd *et al.*, 1999).

human capital investments (Schultz, 1993; Thomas, 1993, cited in Willis, 1994)⁵¹.

In addition to these, and of more relevance to our analysis, are the effects of schooling of women on their fertility through the postponement of first marriage (Cochrane, 1983; Blossfeld and Huinink, 1991; Freedman *et al.*, 1994), and due to the increasing cost of time of women as education also would encourage labour force participation (Ogawa, Jones and Williamson, 1993; Willis, 1994). Education increases a woman's potential income, which also means raising the opportunity cost of bearing and rearing an additional child (Schultz, 1993), thus having a negative effect on fertility.

Women's income earning capacities through their labour force participation outside the subsistence sector is also seen to be related to their levels of fertility in varying ways from society to society (Heitlinger, 1993; Standing, 1983 and references therein) and between different types of occupations (Boserup, 1974; Heitlinger, 1993; Standing, 1983 and references therein; Shapiro and Tambashe, 1993). Standing (1983) outlines six types of conditions that are least likely to make women's work incompatible with high fertility; when elderly relatives in closely knit extended family share the burden of childcare; when the cost of domestic labour for substitute childcare is low; when the desired input of parental time is small; when women work out of necessity than out of intrinsic interest; when the types of women's work such as home based production that is characteristic of rural settings of developing countries allow childcare to be combined with work; or when the time constraints due to childcare is adjusted in leisure time rather than work time.

Fertility becomes negatively affected by women's work when such socio-cultural factors making childcare compatible with women's work are eroded, and the financial and time costs of childcare become incompatible with

51 However, a number of authors (see Bledsoe, *et al.*, eds., 1999) point out that a woman's education is highly correlated with her husband's education, suggesting that factors such as women's autonomy associated with women's education may not be as strong in household decision making as argued here.

women's work due to improvements, among other factors, in schooling opportunities (especially of women), availability of waged employment, and occupational mobility (Standing, 1983; Oppong, 1983). It is not only a woman's current work but also her premarital work experience and future work prospects, that have a downward effect on fertility (Standing, 1978, 1983); the greater the premarital work experience, the stronger would be the desire for fertility limitation. In most societies, fertility is lower among women who are better educated and can therefore expect better paid jobs (Willis, 1994).

The effects of rural to urban migration on fertility levels of women have been well documented (Long, 1970; Goldstein, 1978; Hertz, 1985; Lee and Pol, 1993; Brockerhoff, 1996). In general, migrants are known to have lower fertility than non-migrants (Brockerhoff, 1996).

Several theories have been put forward that seek to explain the link between migrants and fertility. There are four commonly used hypotheses: socialisation, adaptation, selectivity, and disruption (Goldstein and Goldstein, 1982; Hertz, 1985), although more recent literature seem to ignore the first one (Brockerhoff, 1996; Lee and Pol, 1993). Socialisation argument holds that fertility of rural to urban migrants are higher than the urban born and are similar to those who remain in the rural areas due to their rural socialisation, and that it will take at least a generation for their fertility to adjust to the urban levels. In contrast, the adaptation theory argues that the fertility levels of migrants would gradually adapt to the economic, social and cultural environments in the urban area and their fertility levels would converge to the levels of the urban born quite rapidly, within several years.

Ample empirical evidence exists in support of the different theoretical arguments discussed above (Bach, 1981; Goldstein, 1973; Goldstein and Goldstein, 1982; Hertz, 1985; Lee and Pol, 1993). Most of these studies provide evidence of more than one of these effects on the fertility of migrant women.

Return migrants from urban areas can also impact the fertility levels of the non-migrants in the rural areas. To the extent where small family norms, more favourable attitudes towards family planning and the knowledge of multiple methods of contraception prevail in the urban areas the return migrants, through the effects of diffusion (Montgomery and Casterline, 1993, 1996; Retherford and Palmore, 1993; Montgomery and Chung, 1999; Rosero-Bixby, 1999) and social interaction (Watkins, 1991; Bongaarts and Watkins, 1996; Rosero-Bixby, 1999) are likely to influence the fertility behaviour of rural women.

14.1 Data

The analysis in this chapter is based on all currently married women (at the time of 1995 census) in the age group 15 to 49 from the 30 percent samples of households from the rural and the urban areas. Due to reporting errors for women in the higher ages, age 49 is widely regarded as the appropriate upper limit for fertility analysis, using children ever born data (see Chapter 5 for references). Age effects of women are controlled by separate analyses for women aged 15 to 29 and 30 to 49. The dependent variable is categorised on the basis of an analysis of the plots of children ever born alive within the two age groups⁵². For the younger age group, since significant numbers of women were found to be childless, it was decided that four categories should be formed (childless, one child, two children and three or more children). For the older age group the distribution of children ever born figures were positively skewed, peaking at the open-ended category seven or more children, with significantly few numbers childless, one birth, two births, and three births. Thus, the dependent variable for older women was categorised into three groups – three children or less, four to six children, and seven children or more.

Although indicators of recent fertility such as the occurrence of a live birth within the past year, are likely to be more desirable measures of current fertility, the problems associated with correctly situating the birth within the

⁵² Refer to Chapter 13 for a discussion of the independent variables in the analysis.

given reference period (in this case one year) prior to the census (Shryock et al, 1976: 275), makes them less suitable for measuring fertility than the number of children ever born alive reported by women in the age group 15 to 49. However, this is not to say that data on children ever born are free of errors. While children ever born data are subject to errors such as the recall lapse for older women, and inability to correctly report the information by a proxy respondent (see Shryock et al, 1976: 304, and references therein)⁵³ the restriction of analysis for currently married women aged 15 to 49 is expected to limit the effects of such errors.

In order to see the effects of different categorisations of the dependent variable on the direction and the strengths of the relationship between the independent variables and the dependent variable, various models were also run using a different categorisation of the dependent variable (Table not shown). That is, one child (reference category) against childless, two children, and three or more children. The results revealed no significant change in either the strength or the directions of the relationships. A further test was done by excluding all childless women from the model and was found that this made no significant impact on the coefficients of the model either. Thus it was assumed that the former model would yield more robust estimates of the odds ratios within a given age group of women. The results of the regression analyses are presented in Table 14-1, Table 14-2, Table 14-3 and Table 14-4.

⁵³ The issues relating to children ever born data have been discussed in detail in Chapter 5 of this thesis

Table 14-1: Determinants of Fertility, Rural Women Aged 15 to 29. Results of Multinomial Logistic Models (Reference category = childless), n = 4077

Independent variables	One child		Two children		Three or more children	
	Wald statistic	Odds ratio	Wald statistic	Odds ratio	Wald statistic	Odds ratio
Intercept	1.54	-	5.11**	-	41.24**	-
Current age	99.81**	1.27	372.75**	1.65	848.88**	2.30
Age at first marriage	47.97**	0.81	221.18**	0.60	456.32**	0.45
Type of household						
Extended	-	1.00	-	1.00	-	1.00
Nuclear	16.40**	0.58	0.09	0.96	9.92**	1.56
Index of Household level of Development						
Low	-	1.00	-	1.00	-	1.00
High	0.15	0.95	0.04	0.97	4.79**	0.71
Medium	3.58*	0.76	0.69	0.88	0.66	0.87
Number of persons married						
One	-	1.00	-	1.00	-	1.00
Two	1.67	0.80	10.08**	0.57	14.03**	0.51
Three plus	5.43**	0.55	20.11**	0.31	29.88**	0.24
Educational attainment						
No education	-	1.00	-	1.00	-	1.00
Some education	0.03	0.98	1.39	0.85	2.79*	0.79
Labour force status						
Not economically active	-	1.00	-	1.00	-	1.00
Economically active	2.80*	0.82	12.04**	0.63	44.91**	0.38
Migrant status						
Non migrant	-	1.00	-	1.00	-	1.00
Migrant	1.66	1.19	0.87	0.86	4.24**	0.71

* p < .10; ** p < .05

Table 14-2: Determinants of Fertility, Rural Women Aged 30 to 49. Results of Multinomial Logistic Models. (Reference Category = three children or less), n = 3818

Independent variables	Four to six children		Seven plus children	
	Wald statistic	Odds ratio	Wald statistic	Odds ratio
Intercept	41.53**	-	3.83*	-
Current age	0.53	1.01	162.53**	1.13
Age at first marriage	47.32**	0.86	127.28**	0.76
Type of household				
Extended	-	1.00	-	1.00
Nuclear	28.85**	1.66	16.15**	1.50
Index of Household level of Development				
Low	-	1.00	-	1.00
High	4.52**	0.78	0.94	0.89
Medium	0.57	1.10	2.26	1.22
Number of persons married				
One	-	1.00	-	1.00
Two	3.50*	0.80	3.39*	0.79
Three plus	28.83**	0.55	58.94**	0.40
Educational attainment				
No education	-	1.00	-	1.00
Some education	2.78*	0.85	5.57**	0.78
Labour force status				
Not economically active	-	1.00	-	1.00
Economically active	0.33	0.94	8.58**	0.73
Migrant status				
Non migrant	-	1.00	-	1.00
Migrant	8.17**	0.73	8.36**	0.71

* p < .10; ** p < .05

Table 14-3: Determinants of Fertility, Urban Women Aged 15 to 29. Results of Multinomial Logistic Models. (Reference Category = childless), n = 1171

Independent variables	One child		Two children		Three plus children	
	Wald statistic	Odds ratio	Wald statistic	Odds ratio	Wald statistic	Odds ratio
Intercept	3.27*	-	2.21	-	0.00	-
Current age	7.16**	1.10	67.39**	1.44	90.39**	1.58
Age at first marriage	1.01	0.95	49.84**	0.68	87.74**	0.55
Type of household						
Extended	-	1.00	-	1.00	-	1.00
Nuclear	0.39	1.18	4.68**	1.92	4.48**	1.92
Index of household level of development						
Low to medium	-	1.00	-	1.00	-	1.00
High	14.94**	0.29	1.69	0.59	6.84**	0.36
Number of persons married						
One	-	1.00	-	1.00	-	1.00
Two	0.21	0.87	6.50**	0.42	6.43**	0.43
Three plus	0.95	1.67	4.14**	0.26	0.14	1.20
Educational attainment						
No education	-	1.00	-	1.00	-	1.00
Primary	0.09	1.12	0.00	1.01	3.04*	0.55
Middle	6.54**	2.42	0.01	1.03	2.52	0.57
Secondary plus	1.96	1.69	0.31	1.26	1.13	0.62
Labour force status						
Not economically active	-	1.00	-	1.00	-	1.00
Economically active	0.05	0.95	11.09**	0.38	10.43**	0.38
Lifetime migrant status of individual						
Non migrant	-	1.00	-	1.00	-	1.00
Migrant	2.32	1.37	0.19	1.11	0.06	1.07

* p < .10; ** p < .05

Table 14-4: Determinants of Fertility, Urban Women Aged 30 to 49. Results of Multinomial Logistic Models. (Reference Category = three children or less), n = 1203

Independent variables	Four to six children		Seven plus children	
	Wald statistic	Odds ratio	Wald statistic	Odds ratio
Intercept	16.65**	-	4.90**	-
Current age	22.04**	1.07	26.38**	1.08
Age at first marriage	78.62**	0.76	57.94**	0.77
Type of household				
Extended	-	1.00	-	1.00
Nuclear	0.73	1.16	0.11	0.94
Index of household level of development				
Low to medium	-	1.00	-	1.00
High	2.14	0.70	0.02	1.04
Number of persons married				
One	-	1.00	-	1.00
Two	4.71**	0.65	1.34	0.78
Three plus	16.25**	0.44	7.61**	0.55
Educational attainment				
No education	-	1.00	-	1.00
Primary	0.05	1.04	0.97	0.82
Middle	0.08	0.93	0.46	0.83
Secondary plus	9.55**	0.42	14.11**	0.29
Labour force status				
Not economically active	-	1.00	-	1.00
Economically active	7.95**	0.62	6.59**	0.62
Lifetime migrant status of individual				
Non migrant	-	1.00	-	1.00
Migrant	7.08**	0.65	3.19*	0.73

* p < .10; ** p < .05

14.2 Exposure Factors

As has been mentioned elsewhere in this thesis, fertility outside wedlock is held in contempt in the Maldivian society. In the event of an extra-marital pregnancy the parents will hasten to convince the concerned parties to get married as soon as possible, thereby legitimising the child born (author's own observations). Therefore, 'exposure factors' (Davis and Blake, 1956) such as age at first marriage and the number of different marital partners a woman had, becomes important in determining the levels of fertility in the present context.

14.2.1 Age at First Marriage

The age at which a woman first enters into a marital union is known to be an important factor in determining the timing of first birth and subsequently her lifetime fertility (see for instance, Rao and Murty, 1987). The age at first marriage may therefore be one of the most important determinants of fertility in a society like the Maldives, where conscious measures of fertility control have been relatively low (see Chapter 5) and pre-marital fertility is minimal: It is marriage that freely exposes her to conception and childbearing.

The present analysis shows that age at first marriage is, as expected, negatively associated with the fertility of women in the rural and the urban Maldives. The higher the age at first marriage, the less likely it is for a woman to have a higher number of children ever born, irrespective of place of residence. The likelihood of a rural woman in the 15 to 29 year age group to have three or more children, as opposed to none, declines by 55 percent ($p < .05$) with every additional year that she remains never married (see variable 'age at first marriage'). Correspondingly, the likelihood of a rural woman aged 30 to 49 to have seven or more children as opposed to three or less decreases by 24 percent ($p < .05$).

In the urban area, the likelihood of a woman aged 15 to 29 to have three or more children, as opposed to none, decreases by 45 percent with every additional year she remains never married ($p < .05$). Similarly, the likelihood of an urban woman in the age group 30 to 49 to have seven or more children,

as opposed to three or less, declines by 23 percent ($p < .05$) with every additional year she remains never married. It can be seen from the tables that, a similar relationship between age at first marriage and fertility holds when comparison is made between lower fertility and any other higher level of fertility for both age groups of women. These odds ratios suggest the significance of delayed marriage for the reduction of fertility among Maldivian women. However, the observed differences in the strength of the relationship between the two age groups of women is likely to be partly due to the different reference categories used for the two groups.

14.2.2 Number of Persons Married

With high divorce rates and remarriage rates in the Maldives (Miralao, 1991), the number of different marriage partners a woman has during her lifetime⁵⁴ is also likely to be high. Assuming that the risk of conception is largely restricted to the time during which a woman remains married, a higher frequency of marital disruption also means less time exposed to sexual activity, and thus, lower chances of conception. Our analysis shows a strong negative effect of number of marriage partners on the lifetime fertility of women in the Maldives.

For a rural woman in the 15 to 29 year age group, the likelihood of having three or more children ever born (as opposed to none) is 50 percent less ($p < .05$), if she was married to her second marital partner (as opposed to the first) and 76 percent less ($p < .05$) if she was married to her third marital partner (as opposed to the first). Similarly, a woman in the age group 30 to 49 in the rural areas is 21 percent less likely ($p < .10$) to have seven or more children (as opposed to three or less) if she was married to her second marital partner (as opposed to the first), and 60 percent less likely ($p < .05$) if she was married to her third marital partner or higher (as opposed to the first).

⁵⁴ This is not polygamy. Rather it refers to marital unions that a woman had with different men. This is different from number of times married as, in the Maldivian society, it is not uncommon for a couple to get divorced and remarry each other a number of times.

In the urban area, a woman in the age group 15 to 29 is 57 percent less likely ($p < .05$) to have three or more children (as opposed to none) if she was married to her second marital partner (as opposed to the first). The chances of having seven or more children (as opposed to three or less) for an urban woman in the age group 30 to 49 is 45 percent lower ($p < .05$) if she was married to her third husband or higher (as opposed to the first). The odds ratios of a woman having two children as opposed to none (in the case of younger women) and four to six children as opposed to three or less (in the case of older women) ever born alive also decreases with every successive marital partner. Whenever there is a statistically significant relationship, it is negative.

14.3 Individual Level Demographic and Socio-Economic Factors

The socio-economic and demographic factors mentioned earlier in this chapter are examined to study how they affect the lifetime fertility of women in the Maldives. Our analysis shows that almost all of these variables are negatively associated with fertility.

14.3.1 Current Age

It needs no debate that of all variables, the age of an individual will be the most consistently, positively related to the level of a woman's lifetime fertility, whatever her social background may be. Inclusion of current age of women as a continuous explanatory variable in our model shows an important relationship between the age of women and fertility. As expected, there are significant differences in the strength of the relationship within the broad age groups of 15 to 29 and 30 to 49. For instance, among the younger women in the rural areas, every additional year of age increases her chances of having three or more children (as opposed to none) by 2.3 times ($p < .05$), while among the older women, while a statistically significant positive relationship exists at the very high levels of fertility (seven or more children as opposed to three or less), increasing age does not appear to be an important factor (odds ratio of 1.13 at $p < .05$).

In the urban area, the likelihood of a younger woman having three or more children (as opposed to none) increases by 1.58 times with every additional year of age ($p < .05$). Among older women, the effect of age on the chances of having seven or more children (as opposed to three or less) was 1.08 ($p < .05$). These observations suggest the high tempo of fertility of Maldivian women, most of which, occurring before the age of 30. This also indicates the possible impact of delayed first marriage on the completed fertility of Maldivian women.

14.3.2 The educational Attainment

Educational attainment of women appears to be an important negative factor in determining the fertility of younger women in the reproductive ages, both in the rural and the urban areas. Due to the small numbers of women in the higher levels of schooling in the rural areas, it was not possible to compare the effect of different levels of schooling on fertility in the rural areas. Therefore, in the rural areas, comparison is made between those with no formal level completed and those with some formal education. However, in the urban area, where significant numbers of women were found in different levels of schooling, comparison is made between the different levels of schooling and the reference category 'no formal level completed' or 'no education'.

In the rural areas, a woman in the age group 15 to 29 is 21 percent less likely ($p < .10$) to have three or more children (as opposed to none), if she has some education as opposed to no education. For a rural woman in the age group 30 to 49 the chances of having seven or more children (as opposed to three or less) are 22 less likely ($p < .05$) if she had some education as opposed to no education.

In the urban area while there appears to be a negative relationship between education and fertility it is only statistically significant at secondary or high levels in the urban area and primary level in the rural areas. The most interesting (statistically significant) relationship appears to exist among younger urban women where at lower levels of fertility the relationship is

positive for women with middle level of education and negative at higher levels of fertility. In the urban area, compared to women with no education, a younger woman with primary level education is 57 percent less likely ($p < .05$) to have three or more children ever born (as opposed to none). On the other hand the odds ratio of a younger woman having one child (as opposed to none) is 2.42 times higher ($p < .05$) if she has middle school level education as opposed to no formal education. The reverse directions of the relationship among younger urban women at lower and higher levels of fertility suggest the preference for smaller families among the younger urban women and possibly the higher preference for it against the option of remaining childless.

For an older urban women the chances of having seven or more children ever born (as opposed to three or less) is 72 percent less if she has secondary level education as opposed to no formal education and her chances of having four to six children ever born (as opposed to three or less) is 58 percent less ($p < .05$) if she had secondary level education (as opposed to no formal education). The negative association between fertility and education can be more consistently observed among older women, irrespective of place of residence. A possible reason for this may be that much of their fertility decision would already have been made at the time of the census while for the younger women it is less likely to be so.

14.3.3 Labour Force Status

As expected, a woman's labour force participation was found to be negatively associated with her fertility, both in the rural and the urban areas. The relationship is consistent and statistically significant at all levels of fertility and age groups in both the rural and urban areas.

In the rural areas, a woman in the age group 15 to 29 is 62 percent less likely ($p < .05$) to have three or more children ever born (as opposed to none) if she is economically active (as opposed to not active). For older rural women the chances of having seven or more children (as opposed to three or less) are 27 percent less ($p < .05$) if she is economically active (as opposed to not active).

In the urban area, a younger woman is 63 percent less likely ($p < .05$) to have three or more children ever born (as opposed to none) if she is economically active, while an older woman is 48 percent less likely ($p < .05$) to have seven or more children (as opposed to three or less) if she is economically active (as opposed to not economically active). Thus, our analysis shows a clear negative relationship between economic activity and fertility of women in the Maldives.

14.3.4 Lifetime Migration Status

Lifetime migrant status (see section 7.1.1 for the definition) was found to be a significant negative factor in determining the fertility of older women, both in the rural and the urban areas. However, for younger women it is statistically significant only at higher levels of fertility in the rural areas.

For older women in the rural areas, the chances of having seven or more children ever born (as opposed to three or less) is 30 percent less ($p < .05$) if she is a lifetime migrant while the corresponding figure for an older urban women is 27 percent ($p < .10$). Similarly an older rural woman's chances of having four to six children (as opposed to three or less) is 27 percent less ($p < .05$) if she is a lifetime migrant while the corresponding figure for an urban older women is 35 percent ($p < .10$). For a rural woman in the age group 15 to 29 the chances of having three or more children (as opposed to none) are 30 percent less ($p < .05$) if she is a lifetime migrant as opposed to a non-migrant.

The finding of a negative relationship in the rural area was expected as the rural women who have spent time in the urban area are likely to be influenced by urban lifestyles and are, therefore, less likely to have higher lifetime fertility than those rural women who have never lived elsewhere. On the other hand, for lifetime migrants in the urban area, having come from a rural background, their fertility would have been higher than that of the urban born women, if they carry the high fertility norms of their rural origins where fertility levels are on average higher than in the urban area. It is possible that some of the urban women that have reported to have lived elsewhere sometime in their life, rather than coming from the rural areas, may actually be urban born females who

have spent time overseas. If the number of such women is large enough to have a significant impact on the overall fertility levels of migrant women in the urban area, this could provide an explanation for the likelihood of lower fertility among migrant women in the urban area. It was not possible to assess this from the present data. Another explanation, and perhaps a more plausible one would be the effect of selectivity among rural to urban migrants: those who migrate from the rural areas to the urban area are more likely to possess low fertility characteristics (educated and more modernised) and hence more open to fertility control as a group, compared to all non-migrant females in the urban area, who will include women of different educational and family backgrounds.

14.4 Household Level Socio-Economic Characteristics

The variables describing the household characteristics included in the present model are: the type of household (nuclear family or extended family) and the level of development of the household (as measured by the IHD). While the household type measures the influence of the socio-cultural aspects of the household, the IHD measures the economic aspects.

14.4.1 Type of Household

While being in an extended family has been found to be more positive in some aspects such as the educational attainment of individuals, the labour force participation of male household heads, and the levels of household development in the urban area, it has also been found to have a negative effect on the levels of household development in the rural area, and the labour force participation of female household heads (see the analysis in the other chapters in this part – Part C – of this thesis). Nuclear family households appear to be associated with higher fertility than extended family households, both in the rural and the urban areas of the Maldives, whenever there is a statistically significant relationship, except for younger rural women at lower levels of fertility, where a woman in a nuclear household (as opposed to an extended household) was 42 percent less likely ($p < .05$) to have one child (as opposed to none).

In the rural areas, a woman in the age group 15 to 29 is one and a half times more likely ($p < .05$) than a similar aged woman in an extended family household, to have three or more children ever born (as opposed to none). The corresponding chances for an urban woman in the similar age group is 1.92 ($p < .05$).

For women in the age group 30 to 49, the chances of having seven or more children (as opposed to three or less) are 1.5 times higher ($p < .05$) in the rural areas if she is in a nuclear household (as opposed to an extended household). The relationship is not statistically significant for older urban women.

Several explanations can be offered for the observation of greater odds for women in nuclear households to have higher lifetime fertility as opposed to women in extended households. First, it can be explained by the likelihood for nuclear families with more children to move out of their extended family system, to set up their own households.

Second, it may be associated with the women's past experiences at the initial stages of their childbearing years of having lived within an extended family household which has already influenced her fertility before she has moved into a nuclear family household of her own family, or; a third explanation could be that while a woman lives in a nuclear household according to our definition, she may in fact be highly dependent on the extended family to an extent that they may exert much influence on the autonomy of her nuclear family, including family size decisions and fertility control measures.

In addition to these, there is a fourth factor, which may have a downward influence on a woman's fertility. Given the fact that there is a severe shortage of housing land in many of the more densely populated islands of the Maldives, including the capital island Male', living in an extended family household may be a matter of circumstance rather than choice. Such tangible factors as the physical limitations of housing space, is likely to be an important factor in

reducing the lifetime fertility of women in the Maldives⁵⁵. However, while living in an extended family household is more likely to contribute to the problems of housing space, there is not data to empirically support this argument. The possible association between extended family settings and housing congestion, if true, would also lead to the issue of less private time for couples leading to low fertility.

14.4.2 Household Level of Development

The household level of development, as indicated by the Index of the household level of development (IHD) appears to have a negative effect on the fertility of Maldivian women, whenever there is a statistically significant relationship. For instance among younger women the chances of having three or more children (as opposed to none) are 30 percent less ($p < .05$) if she is in a high IHD household (as opposed to low) in the rural areas. In the urban area, the corresponding chances are 64 percent lower if she is in a high IHD household (as opposed to low to medium).

For older women, a statistically significant relationship was found only in the rural areas. A rural woman in the age group 30 to 49 was 32 percent less likely ($p < .05$) to have four to six children (as opposed to three or less) if she is in a high IHD household (as opposed to low). These results suggest that there exists a significant association between a woman's lifetime fertility and household affluence in the Maldives.

In addition to above variables, the effect of the inclusion of other household level variables such as the presence of other ever married women of the similar age group and women of the alternative age group were also studied. It appears that the inclusion of these variables does not affect either the direction or the strength of any of the variables discussed in the present section, nor did they show a statistically significant relationship with fertility. Thus, they were excluded from the model presented here.

⁵⁵ This observation is based on the author's experience of the urban and rural communities of the Maldives over the years.

14.5 Discussion

The fertility differentials among currently married women in the urban and the rural areas of the Maldives, when controlled for the broad age group of women, show some interesting patterns of association with different socio-economic and some direct fertility control factors. Exposure factors, such as the age at first marriage and the number of persons married, were found to be important negative factors of fertility of Maldivian women although the strength of the relationship was found to be greater for younger women and considerably weaker in the case of the older women. In the absence of widespread use of deliberate measures to control fertility (see Chapter 5), the importance of age at first marriage for a woman's fertility becomes more evident. Our findings support similar findings from other developing countries, especially the experiences of other Asian countries (see for instance, Cho and Retherford, 1973).

The number of persons a woman marries during her lifetime, as expected, showed a negative association with her lifetime fertility. The negative effect of the number of persons married on fertility is due to the loss of time that a woman is exposed to the risk of conception due to the marital disruptions. While it has been argued by Downing and Yaukey (1979) that the frequency of marital disruption is likely to have an anti-natalistic effect on fertility in low fertility situations, with relatively high levels of fertility, the effect of marital disruptions in the Maldives appear to be negative on a woman's fertility. Chaudhury (1996) has also observed a negative relationship between frequency of marital disruption and fertility from Maldivian data. Similar findings have also been observed by Tabutin (1979) in some other Islamic societies.

Our analysis found, as expected, a positive link between age of women and her lifetime fertility. While this is a truism in itself, the finding of a significantly stronger relationship for women under the age of 30 suggests the high concentration of fertility in the early childbearing years of a woman's life.

As expected, education of women was found to have a significant negative effect on fertility in the Maldives. More educated women were found to be less likely to have a higher lifetime fertility than those with no education are. This is perhaps the most consistent observation in the studies of fertility. The delaying affect of schooling and increasing cost of children, both directly and indirectly, through increased cost of time of educated females on their fertility, are the most widely hypothesised factors in the literature (Ogawa, Jones and Williamson, 1993; Cochrane, 1983; Blossfeld and Huinink, 1991; Freedman *et al.*, 1994; Willis, 1994; Schultz, 1993). However, it is not only the educational levels of women or the increasing cost of women's time that is likely to significantly affect fertility. The increasing cost of providing education to children is also likely to be a significant factor, as evident from the following views expressed by a 45 year old carpenter (man) who heads an extended family household in an island of the Maldives (Mahibadhoo), when asked what the average family size in the island would be:

... on average there will be about five to six or eight children. These days people of this island practice birth control. I think it is a good thing to control. When one considers things like looking after children, the costs of providing them with their needs, providing education, more than three to four children is I think too much...when the family size is large there are some advantages but on the other hand there are disadvantages too...for instance in my family there are some disadvantages because it is large...there are advantages too...there are two sides of it isn't it? Expenses are high when the number of children is large...buying schoolbooks and paying for tuition fees, buying other things, all these things increase with the number of children (Qualitative interviews in Mahibadhoo, 1998).

A woman's labour force participation was also found to be negatively associated with her fertility. Those who were economically active were found to be less likely to have higher lifetime fertility than those who were not in the labour force. This finding is consistent with our findings of a positive relationship between labour force participation and education (chapters 15 and 16) and a negative link between education and fertility (this chapter). Thus, it appears that for those women in the labour force, the societal and familial supports of high fertility such as alternative low-cost childcare, are not likely to be strong either in the urban or the rural Maldives.

Urban exposure of rural women, as proxied by their lifetime migration status, was found to have a negative effect on fertility. However, contrary to the socialisation theory of fertility, a rural childhood, as proxied by the lifetime migration status of urban women, was also found to have a negative effect on fertility. This is probably because the majority of rural to urban migrant women are younger, and has migrated to attend schools in the urban area. Fertility of this select group of women are likely to be lower than the urban born women in the same age group from mixed socio-economic backgrounds. This suggests that rural to urban migrant women in the Maldives are a selective group, possibly those who migrate from rural schools to further their schooling in urban schools and those more egalitarian women who have higher than average aspirations and means to provide their children with superior education and are thus more adaptive. Evidence of such multiple effects exists from other developing countries (see for example; Hertz, 1985; Lee and Pol, 1993).

Extended family households appear to be less conducive for fertility of women in the Maldives than nuclear family households. While nuclear family households are likely to be those families that have grown out of the extended family households, limitations imposed by the shortage of housing land continues to force individuals to live in extended family households even after marriage in the more densely populated islands of the country. Although most theories contend that the extended family settings are more conducive to high fertility due to such factors as the dominance of the patriarch, which encourages early marriage and childbearing (Caldwell, 1976a, 1981; Burch, 1983), our findings contradict the dominance of such forces in the Maldives. In fact, it seems that housing congestion and the lack of privacy for couples, among other restrictions imposed by the extended family setting, discourages high fertility in the Maldives (see Nag (1967, 1980) for somewhat similar conclusions. Paydarfar (1995) based on data from Iran also finds that multifamily housing is associated with lower fertility.

Household affluence, as determined by the index of the household level of development (IHD) was not found to be an important factor in the fertility of

women, either in the rural or in the urban areas. Among the other household level factors, the presence of other women of childbearing ages, whether it is of the same age group, or of the opposite age group (older for younger women and younger for older women), was found to be negatively associated with a woman's lifetime fertility. This effect is explained by the likelihood of such households being extended family households, thus highlighting the role of some factors that may be associated with extended family households in determining the fertility of women in the Maldives.

In sum, in spite of some shortcomings in our data, the directions of the relationships between the various independent variables and the dependent variables in the present model are consistent with existing empirical literature. It underlines the important linkages between improvements in the socio-economic conditions at the level of the households and the reduction of population growth rates for sustaining the present levels of economic development in the Maldives. More specifically, it points out the crucial role of improved accessibility to schooling at the higher levels, which would further raise the mean age at marriage, especially of women, and also improved accessibility of employment in the modern sectors for young women prior to their childbearing years, both of which, will further accelerate the pace of fertility decline. Indirectly, this would also increase the participation of locals in the labour force, thereby alleviating the problem of rapid growth of the expatriate workforce in the Maldives.

Chapter 15: Education and Socio-Economic Characteristics

The measurement of the determinants of the educational aspect of human capital can be either the input or the output of the educational system, namely, schooling. Educational attainment has been used in studies of human capital as a measure of the level of human capital (see for example, Becker, Murphy and Tamura, 1990; Byron and Manaloto, 1990; Barro and Lee, 1993)⁵⁶, while school enrolment ratios have been used as a proxy for the investments in human capital (Barro, 1991). The present study chapter explores the link between various individual level and household level socio economic factors on the school attendance of 15 to 17 year olds as a measure of human capital. Deolalikar (1997) has used school attendance as a measure of human capital in a study of the determinants of human capital expenditure in Kenya.

Fertility and family size have a significant effect on the education of children in a family (Lindert, 1977). Numerous studies based on data from different societies have revealed the negative effects of large families on the education of siblings (Behrman and Wolfe, 1987; Parish and Willis, 1993; Shreeniwas, 1993). While there are several associated factors, parental time appears to be a major factor in this relationship. The amount of parental time received by a child at home is increased with smaller family size and more spacing of children within the family. While these findings are based on developed country data (Leibowitz, 1974, Murnane, *et. al.*, 1981, Hanushek, 1992), evidence from developing country populations suggest that significant differences exist in the relationship between family size and education of children, between cultures (Hossain, 1990; Harbison and Hanushek, 1992) and is believed to be related to the level of development (Lloyd, 1994) and is likely to be stronger in the urban area than in the rural areas.

⁵⁶ Mason (1993) points out that the number of years of schooling is actually a measure of the student's input rather than a result of the education process. Number of years of schooling is the measure commonly used to compute the different levels of educational attainment from census and survey data.

In some developing countries there is evidence that older siblings and members of the household pay for younger siblings' schooling (Hossain, 1990). Hanushek (1992) explains that in terms of parental time allocation, children in smaller families are at an advantage because it increases a particular child's chances of being the first born.

There are also differences between educational investments between girls and boys. With evidence from Taiwanese data, Parish and Willis (1993) conclude that, "early born children in large families perform poorly, particularly if they are female." One would suspect that gender discrimination in the distribution of education within the family would exist only when the family size is large. However, as evidenced from rural Maharashtra, there is some indication that in traditional societies where women's status is low and sex discrimination within the family is common, even in smaller families, girls may not be availed of an equal share of the extra family resources available for education, with her male siblings. Instead, greater educational attainment of boys in small families is made possible through the increased time contributed by their sisters to the family farm (Jejeebhoy, 1993). Lloyd (1994) argues that even with such findings, it is more likely that parents with more children would discriminate against their female children in the allocation of schooling and other forms of investment more than parents with fewer children.

Parental educational attainment has an important positive effect on the human capital of children (Deolalikar, 1997). Educated mothers are more likely to provide children with better care and be more able to help their children with schooling. They are also more capable of understanding the particular needs of individual children and to adequately address them (Murnane *et al.*, 1981). Using data from Malaysia, Lillard and Willis (1994) concluded that while mother's education had a stronger impact on the education of daughters, father's education had a stronger impact on the education of sons.

Murnane *et al.* (1981) also found that girls are more likely to be disadvantaged in schooling than boys, especially in rural areas as opposed to urban areas. It is not only girls that are more disadvantaged in rural areas but rural urban

differentials in educational accessibility and quality are known to exist in most developing countries and even in some developed countries (Muhsam, 1974).

15.1 Data

The present analysis uses census data on current school attendance for the population aged 15 to 17 from the rural and the urban areas of the Maldives. The data are from the 1995 Population and Housing Census. The specific cases of the data set used in the present analysis comes from the 30 percent samples of the rural and the urban households discussed in Chapter 13.

The decision to use this age group is based on several factors that are important for the analysis of the determinants of human capital decisions at the level of the households in the Maldives. Firstly, for reasons already discussed in Chapter 10, such as the expansion in the delivery of primary schooling facilities at minimal private cost to the entire population of the country, and the high demand for education on the part of the families, primary schooling has become almost universal in the Maldives.

Secondly, examination of school attendance figures for the secondary school age population revealed that only 10 to 12 percent of the selected population in the secondary school age group (13 to 15) were not schooling which does not provide adequate numbers to study the correlates of schooling (see Table 15-1).

Table 15-1: Current School Attendance, 13 to 15 Year Olds by Order of Selection, Rural Sample

Schooling status	Order of selection*			
	Youngest child		Oldest child	
	Number	Percent	Number	Percent
Schooling	2725	89.79	2663	87.74
Not schooling	310	10.21	372	12.26
Total	3035	100.00	3035	100.00

* In each household the youngest child and oldest child in the age group 13 to 15 were selected

Source: Computed by the author

This leads to the next level of education, which is the higher secondary, which consists of two years of schooling leading to the advanced level certificate of the General Certificate of Education (London). While accepting that this level

of education is only available in the urban area and selected islands in the rural areas, it is also recognised that a significant proportion of the population in the rural schools, and in some of the private schools in the urban area, are over-aged for the respective classes at the secondary level. Some students, especially those who come from the rural schools to study in the urban schools, remain in school even after the age of 17, in order to complete their secondary schooling⁵⁷.

Thirdly, the minimum legal age at marriage recently being set at 15, most children tend to remain in school until they are 15 years old. After this age, socio-economic factors of the parents and children themselves are likely to become more important in determining whether they continue schooling or drop out. Furthermore, participation in schooling at the secondary and higher secondary levels is likely to be an important factor for their future human capital levels, since the progression to the next levels – vocational and higher academic studies – depends, to a great extent, on the level of a person's competence at these levels.

The dependent variable in the present model is school attendance, where it can take either of the two values – 1) Schooling, or 2) Not schooling. Those who are 'not schooling' are taken as the reference category for the regressions. The information on schooling is based on a single question in the census which asked, 'is the respondent currently attending an educational institution?' This is a fairly straightforward question and is not likely to be erroneously reported for the age group in question.

The explanatory variables are mainly household level socio-economic characteristics, some of which measures household influences and others measure the influences of the household head. Individual level variables, sex of the child and the child's migration status are also included. The results of

⁵⁷ This can be seen by the participation of pupils from some secondary schools in the highest age category of '16 years and over' in the annual inter-school singing competitions organised by the Television Maldives.

the rural and the urban models are presented in Table 15-2 and Table 15-3, respectively.

Table 15-2: Determinants of Schooling, 15 to 17 Year Olds, Rural Maldives. Schooling vs Not Schooling (base category). Results of Logistic Models (n = 2240).

Independent variables	Order of selection ^a			
	Youngest		Oldest	
	Wald statistic	Odds ratio	Wald statistic	Odds ratio
Intercept	0.00	-	0.02	-
Number of household members under 15	0.60	1.02	1.11	1.03
Index of household level of development				
Low	-	1.00	-	1.00
Medium	7.07**	1.41	9.85**	1.48
High	2.70*	1.23	3.94**	1.28
Type of household				
Extended	-	1.00	-	1.00
Nuclear	13.08**	1.42	12.39**	1.39
Education of head				
No grade	-	1.00	-	1.00
Primary	1.88	1.16	0.26	1.05
Middle	1.14	1.27	2.31	1.41
Labour force status of head				
Not active	-	1.00	-	1.00
Economically active	1.51	1.15	1.18	1.12
Other children aged 15-17 in household				
Not present	-	1.00	-	1.00
Present	40.62**	2.86	7.69**	0.70
Sex of household head				
Female	-	1.00	-	1.00
Male	1.12	1.12	0.12	1.04
Sex of child				
Female	-	1.00	-	1.00
Male	5.64**	1.25	7.54**	1.29
Migrant status				
Non migrant	-	1.00	-	1.00
Migrant	0.00	1.00	0.29	1.08

* p < .10; ** p < .05

a In each household the youngest child and the oldest child in the age group 15-17 were selected.

Table 15-3: Determinants of Schooling, 15 to 17 Year Olds, Urban Maldives. Schooling vs Not Schooling (base category). Results of Logistic Models (n = 930)

Independent variables	Order of selection ^a			
	Youngest		Oldest	
	Wald statistic	Odds ratio	Wald statistic	Odds ratio
Intercept	1.35	-	5.46	-
Number of household members under 15	2.84*	0.93	4.35**	0.92
Index of household level of development				
Low	-	1.00	-	1.00
Medium	3.62*	2.66	0.05	1.10
High	5.32**	2.25	1.62	1.56
Type of household				
Extended	-	1.00	-	1.00
Nuclear	4.25**	1.61	1.31	1.26
Education of head				
No grade	-	1.00	-	1.00
Primary	1.86	1.37	0.20	1.09
Middle	0.49	1.17	0.44	1.14
Labour force status of head				
Not active	-	1.00	-	1.00
Economically active	0.47	0.85	3.80**	0.66
Other children aged 15-17 in household				
Not present	-	1.00	-	1.00
Present	17.71**	2.36	2.24	0.78
Sex of household head				
Female	-	1.00	-	1.00
Male	0.77	1.22	3.28*	1.44
Sex of child				
Female	-	1.00	-	1.00
Male	2.15	0.76	1.74	0.81
Migrant status				
Non migrant	-	1.00	-	1.00
Migrant	5.37**	1.55	16.75**	1.99

* p < .10; ** p < .05

a In each household the youngest child and the oldest child in the age group 15 -17 were selected.

15.2 Household Level Socio-Economic Factors

15.2.1 Number of Household Members Under Age 15

In the rural areas of the Maldives, the number of children under the age of 15 in the household does not appear to be an important factor in the schooling of children aged 15 to 17. However, in the urban area, there is a statistically significant negative relationship between schooling of children aged 15 to 17 and the number of children under 15 years of age in the household.

15.2.2 Level of Household Development (IHD)

The level of household development appears to have a positive effect on the schooling of children in the age group 15 to 17. This relationship exists for both rural and the urban households irrespective of the method of selection of child and is statistically significant except in the urban area when the oldest child in the age group is selected.

In the rural areas, when the youngest person in the age group is selected, the likelihood of schooling is 1.2 times higher ($p < .05$) if the level of IHD is high (as opposed to low). When the level of IHD is medium (as opposed to low) the corresponding likelihood is 1.4 times higher ($p < .05$). The chances of schooling by the different levels of IHD, when the oldest person in the age group 15 to 17 is selected, are similar to those when the youngest person in the age group is selected.

The effect is stronger in the urban area when there is a statistically significant relationship. When the youngest child in the age group is selected, the chances of schooling for a high IHD household is 2.3 ($p < .05$) and for a medium IHD household is 2.7 ($p < .10$) greater than for a similar aged child in a low IHD household. These findings provide strong evidence that household wealth is favourable for children's human capital development, both in the rural and the urban Maldives.

15.2.3 Type of Household

The type of household - nuclear family or extended family – seems to have an important effect on the schooling of children in the rural and the urban Maldives. In the rural areas, a younger person in the age group 15 to 17 is 1.4 times more likely ($p < .05$) to be schooling than not, if the household is a nuclear family as opposed to an extended family. The odds ratio for an older person in this age group is similar and highly significant ($p < .05$).

In the urban area, a younger person selected is 1.6 times more likely to be schooling if the household is a nuclear family unit as opposed to an extended family household ($p < .05$). These findings probably reflect the ability of parents in nuclear family settings to better care for their children's schooling than in extended family settings. In the extended family settings where there are other children of similar ages it is more likely that parents are able to effectively supervise their homework and other educational inputs. Housing in extended family households are also more likely to be crowded than in nuclear family households, thus adding further constraints to children's schooling input (Murnane *et al.*, 1981)⁵⁸.

15.2.4 Education of Household Head

Educational attainment of the household head appears to be positively related to the schooling of children aged 15 to 17 in the household, both in the rural and the urban areas of the Maldives. However, these odds ratios are not statistically significant.

15.2.5 Labour Force Status of Head

Labour force participation of household head appears to have a positive effect on the schooling of children aged 15 to 17 in the rural areas, but a negative effect in the urban area. However, in the rural area, it is not a statistically

⁵⁸ Although the study by Murnane et al (1981) did not find housing to be consistently related to children's schooling they cite that other studies have found significant association between these two variables.

significant relationship. When the oldest child in the age group in the urban area is selected, the chances of schooling is 34 percent lower if the household head is economically active, as opposed to not active ($p < .05$).

15.2.6 Presence of Other Children Aged 15 to 17 in Household

The effect of the presence of other household members aged 15 to 17 years on the schooling of the youngest child in the age group and the oldest child in the age group suggest some interesting household factors of human capital investments in the Maldives. For the youngest persons in this age group, the presence of older siblings or household members in this age group is likely to have a positive effect on their schooling, while for the oldest persons in the age group, the presence of younger household members in this age group is likely to have a negative effect.

In the rural areas, the youngest person in the age group 15 to 17 is nearly three times more likely ($p < .05$) to be schooling when there are older household members in this age group present. Similarly in the urban area the corresponding chances are 2.4 ($p < .05$). The oldest person in the age group 15 to 17, in a rural household, is 30 percent less likely to be schooling ($p < .05$) if there are younger persons in the age group present in the household. The corresponding odds ratio in an urban household is 22 percent ($p = .13$).

These findings suggest that, when there is sibling competition for household resources for schooling, the older children are likely to drop out and probably subsidise the cost of schooling of younger children, while the younger children are likely to benefit from the contributions of their older siblings (see for example, Parish and Willis, 1993 and references therein).

15.2.7 Sex of Household Head

Compared to female-headed households, male-headed households appear to be more favourable to the schooling of children in the age group 15 to 17 although the relationship is weak and statistically significant only in the urban area when

the oldest children in the age group is selected. They are 44 percent more likely to be schooling if they are in a male-headed household.

15.3 Individual Characteristics of the Child

15.3.1 Sex of the Child

Sex of child appears to be an important factor in the schooling of children in the age group 15 to 17 in the rural areas of the Maldives. However, it does not appear to be a significant factor in the urban area. If at all a relationship exists, it appears to favour girls although it is not statistically significant.

When the youngest child in the age group is selected, a male child in the age group 15 to 17 is 25 percent more likely to be schooling ($p < .05$) than a female child in the same age group in the rural areas. When the oldest child in the age group is selected, the corresponding chances are 1.29 ($p < .05$).

It seems that males are more likely to be encouraged to seek higher levels of schooling than girls in the rural Maldives, while in the urban area where such biases are likely to be minimal, females are more likely to continue to higher levels of schooling than males. The higher odds for females to continue schooling at higher levels in the urban area is probably due to the existence of attractive employment opportunities for females, mainly in the male dominated sectors, such as the tourism industry, concentrated in and around the urban area. These findings are consistent with findings from other countries (Murnane *et al.*, 1981; Muhsam, 1974).

15.3.2 Lifetime Migration Status of the Child

As will be recalled from Chapter 7, lifetime migration is defined as the change of usual place of residence at least once between birth and the time of census. There being only one urban area in the country, lifetime migrant status is likely to affect the schooling of individuals in the urban area, where lifetime migrants are almost invariably those that have moved from the rural areas. Lifetime migrants in the rural areas are most likely to be those that have lived in the urban area and returned back to their islands in the rural areas.

As expected, this variable does not appear to be important in the rural areas, but very important in the urban area. When the youngest person in the age group 15 to 17 was selected, the chances of schooling were 1.6 times higher for migrants as opposed to non-migrants ($p < .05$). Similarly, when the oldest person in the age group in the household was selected, the corresponding chances were twice ($p < .05$) that for non-migrants.

Although it is not possible to study the socio-economic backgrounds of those children who are able to attend schools in the urban area from the census data, qualitative data collected by the author suggests that they are mostly children of parents with networks in the urban area or those who can afford to move the entire household to the urban area. These aspects are important especially when there is no established system of boarding schools or other types of boarding for students from rural areas to live in the urban area while they attend urban schools. Following accounts provide some evidence:

My sister and her husband lives in Male' (urban area) for their children's education. My sister's husband works in a resort. They have been living in Male for the past ten years or so (as reported by a 39 year old woman in Maradhoo-Feydhoo).

I normally live in Male' (urban area) with my family...presently I am here to visit my daughter because it is school holidays and I am free from the duties of sending children to school in Male'... I will go back to Male' as soon as the school holidays are over...my husband works in a resort. He has been working there for a very long time now... he pays for the expenses of the family for staying and education in Male' (as reported by a middle aged woman from Maradhoo-Feydhoo).

We do not differentiate between girls and boys in providing education...maybe because I have more daughters...in fact I think we have given more attention to our girls...the quality of education given has improved with each child...when my two eldest children finished school from grade seven, I did not have enough means nor did I have friends in Male' to send them to a school in Male' to further their studies...so their education ended there...after that my eldest daughter was able to complete grade ten because that is available in the local school now...she is now employed by the school as a temporary teacher...she may go for training next year...one by one we will educate them up to as much as they desire and up to our abilities to provide for them (as reported by a 45 year old man from Mahibadhoo island).

15.4 Discussion

Several interesting findings emerge from the analysis of the relationships between different socio-economic factors at the individual and household level and the likelihood of schooling at the secondary and the higher secondary schooling ages in the rural and the urban Maldives. The patterns and strengths of the relationships suggest certain differences in the private costs of schooling, between those from rural backgrounds and those from the urban backgrounds.

While the level of child dependency at household level is not a significant factor in the schooling of children at higher grades in the rural areas, a negative relationship in the urban area probably reflects two aspects of costs and opportunities in the urban area. It is possible that the relatively higher private costs of schooling at higher grade levels in the urban area, such as high tuition fees, and the existence of numerous opportunities for employment mostly in the private sector, increases the opportunity cost of remaining in school at this level. Another factor for the urban rural differences in the importance of this variable for children's schooling in these age groups may be that, in the rural schools most children of this age group may still be attending secondary school grades leading to O'level⁵⁹ exams, while most children in this age group in the urban area would have completed their O'level exams, which gives them less incentive to continue schooling at that age group.

The positive relationship found between the levels of household affluence, as reflected by the IHD, and children's schooling at higher levels suggest the importance of private input for the schooling of children at higher grade levels. The stronger relationship for younger children in the age group in the urban area compared to rural children, both young and old, probably reflects the effects of the differences in the cost of living between the rural and the urban areas.

⁵⁹ General Certificate of Education of the University of London, Ordinary Level.

The present analysis shows that the nuclear family households are more favourable for the schooling of children at the higher levels than extended family households. It is most likely that this is related to the high density levels in extended family households and the relative lack of private time for study at home.

Education of household head was found to have a positive effect on the schooling of children aged 15 to 17. It appears that educated household heads are more likely to encourage their children to pursue higher levels of schooling than those with no education. Although these findings are not statistically significant, the direction of this relationship conforms to the existing theoretical and empirical literature (see Deolalikar, 1997; Lillard and Willis, 1994).

The positive link between the household level of development and schooling is also reflected to some extent in the existence of a positive relationship between the labour force participation of household head and the schooling of children aged 15 to 17 in the rural areas, although these are not at statistically significant levels. The more interesting finding is that of a negative relationship between these two variables at statistically significant levels for the oldest child in the urban areas. It is possible that employed heads are more capable of finding the desired types of employment opportunities for their secondary school leaving children through their networks and connections in the private and public sectors.

Our analysis shows that at the secondary and higher secondary school ages, schooling of older children is more likely to be disrupted when there are other siblings in the same age group in the household. On the other hand, when there are more siblings in this age group present in a household, the youngest are more likely to continue schooling than if they are alone. Similar effects have been observed in East Asia, where older children have been found to interrupt their schooling, to support the schooling of younger siblings (see for instance, Mason, 1993).

The positive association between male household head and children's schooling is likely to be caused by socio-cultural factors. Due to the patriarchal nature of the Maldivian society, female households may be less able to control their teenage children in the absence of a male authority in the household.

It is also interesting to find that while there was no significant difference between males and females in the chances of schooling in the urban area, males in the rural area are encouraged to seek higher levels of schooling than females. This differential attitude of parents is likely to be due to their perception of the roles of males and females in the society. While these factors have been considerably weakened in the urban area, they still remain significant in the rural Maldives.

Rural to urban migrants were found to be more likely to be schooling than the urban born children in the age group 15 to 17. This is probably because those rural to urban migrants do so primarily for the purpose of attending schools in the urban area and not primarily for work purposes. Since their schooling competency for age is likely to be lower than the urban born, they are likely to remain in school longer than the urban born in order to complete secondary or higher secondary levels of education. As indicated by the qualitative data, the urban rural disparities in educational accessibility are further exacerbated by the inequalities among the rural population in getting access to urban schools. Among the rural populations, those households that are able to finance the high urban costs of living for their family members in the urban area, or those who have connections with urban households are likely to be the more advantaged in this regard. Employment of the household head in the urban sector is an important way of getting access to, among other things, ways and means of getting their children to urban schools.

Chapter 16: Employment and Socio-Economic Characteristics

The previous chapter looked at the household level and individual level factors associated with a child's schooling at the secondary school ages as schooling at this level is important for human capital development because it provides a basis for further skill development and employment. The present chapter analyses the link between an individual's labour force participation and levels of human capital, household dependency, migration and other individual and household level socio-economic variables.

An individual's chances of employment will depend on several socio-economic and demographic characteristics of the particular individual and the characteristics of the household to which the individual belongs. Among the several factors that determine the supply of labour the induced factors are particularly interesting as they are related to economic factors, social factors and cultural and other factors which determine the labour force participation of individuals (Farooq and Ofusu, 1992; see also Chapter 3 of this thesis).

Labour force participation is determined by several factors such as incentives to work, opportunities available, expected income from work, opportunity cost, degree of job satisfaction associated the work, and demand (or the perceived need) for income (Standing, 1978). The opportunities available in the job market are likely to be transmitted through certain networks and the access to such opportunities may be restricted to those who are able to get access to such networks (Tenjo, 1990). On the other hand, the incentive to work is likely to be a factor of the opportunity costs, the demand for income, and the types of work available in relation to the types of work desired (Berry, 1975; Udall and Sinclair, 1982; Tenjo, 1990).

Some of the more prominent socio-economic factors that influence an individual's labour force participation are, the levels and geographical distribution of employment opportunities, availability of educational opportunities and the levels of educational attainment of individuals, level of

urbanisation, and traditional attitudes towards labour force participation of different groups (Durand, 1974; Standing, 1978; Farooq and Ofusu, 1992).

Migration and labour force participation are two closely linked events. Depending upon the definition of migration, virtually all forms of employment require some form of migration, some of which may be described as circulation or circular migration (see Chapman and Prothero, 1985 and references therein). Because of the effects of poor social networks, lower aspirations, and greater need for income from work, migrants are more likely to be employed than non-migrants in the urban areas (Standing, 1978).

While the labour force participation of males in the age group 20 to 59 is likely to be universal in most societies, the above factors are more important for the labour force participation of women and youth (Farooq and Ofusu, 1992). The measurement of the labour force participation of women from data sources such as census is problematic in developing countries, as they tend to classify women as economically inactive if they are engaged in activities such as subsistence agriculture, market gardening, and home based production (Boserup, 1974; Standing, 1978). However, in developing countries, female labour force participation is likely to be higher in the rural areas where the subsistence or the family mode of production in primary activities are important, while female participation rates are likely to decline as transition to wage employment and increasing incomes of male income earners occur (Standing, 1978 and references therein). Even in instances where the income of the particular family may not have increased significantly, increase in the levels of income of the average household is likely to discourage females from participating in the labour force, partly as a result of male prestige (Mencher, 1988). In this respect, marital status may be an important factor in influencing the labour force participation of women. Findings from Thailand (Cook and Leopropai, 1977) provide some support to this argument.

The role of educational attainment of women as a determinant of their labour force participation appears to differ from society to society depending upon the extent of spread of schooling. When the proportion of women with schooling

are low, those who get schooled are at considerable advantage over other women of similar ages in their community, in getting employed. This advantage declines as the amount of schooling increases, thus reducing the relative advantage at a given level of schooling to get employed (Diamond et al., 1999 and references therein).

In relation to the networks and aspirations effects of unemployment, two hypotheses have been put forward. An aspirations effect, which is reflective of the relative well-being of individuals or families, is caused when the people have higher aspirations for the types of jobs, wage rates, working conditions, and job status than those offered by the existing labour market (Berry, 1975). The other hypothesis is that individuals and their desired jobs interact through a system of networks connecting individuals with employers, which provides individuals with the right opportunities. When connections with such networks are lacking, individuals have few opportunities to find the types of jobs they seek (Tenjo, 1990). While the aspirations effect is more relevant to the middle and upper income levels of the society, and also to those with higher levels of schooling, the opportunities effect is more relevant to the lower income rural workforce (Tenjo, 1990).

This chapter looks at the relationship between different individual and household level socio-economic and demographic characteristics and the labour force participation of household members from the randomly selected households discussed in chapter 13. Labour force status of an individual is the dependent variable in the employment models.

The determinants of labour force participation at the individual level is studied through two approaches – the relationship between various individual and household level socio-economic and demographic characteristics on the labour force participation of the household head, and the relationship between these variables and the labour force participation of the eldest child/step child of the household head that is living in the same household. The dependent variable can take either of the two values – 1 ‘economically active’ or 2 ‘not economically active’. The reference category in the regression models is the

'not economically active'. The list of independent variables in the models is given in Table 13.1, Chapter 13.

Separate analyses are conducted for the rural and the urban areas. The effects of individual and household characteristics on the labour force participation of the individuals in the rural model are controlled for the effects of the individual's age group and sex. However, the small size of the urban sample does not permit such controls in the urban model. In controlling for the effects of age, the younger age group in the working age population will be taken as those aged 15 to 34 years of age. Since some of those in this age group are likely to be engaged in full time schooling, those who were reported to be attending some form of educational institution at the time of the census were excluded from the analysis. The older age group, 35 to 64 years of age represent the mature labour force.

16.1 The Rural Context

Regression coefficients of the analysis of interlinkages between the labour force participation of the household head and various individual level and household level socio-economic characteristics of the rural population are provided in Table 16-1, Table 16-2, Table 16-3 and Table 16-4.

**Table 16-1: Determinants of Employment, Male Household Heads, Rural Maldives.
Estimates from Logistic Models (Economically active vs not active)**

Independent variables	Age of household head 15 to 34 (n = 803)		Age of household head 35 to 59 (n = 1941)	
	Wald statistic	Odds ratio	Wald statistic	Odds ratio
Intercept	8.43**	-	3.17*	-
Number of persons under 15 in household	0.23	1.04	11.48**	1.15
Island economy				
Tourism	-	1.00	-	1.00
Mixed	4.53**	0.28	0.27	1.15
Fishing	0.96	0.58	9.19**	1.99
Tourism and fishing	0.01	0.92	3.44*	2.09
Agriculture	6.79**	0.18	0.88	1.40
Island zone				
Within zone	-	1.00	-	1.00
Periphery of zone	0.65	1.59	1.10	0.71
Outside zone	2.05	1.82	0.45	0.84
Distant from zone	2.83*	2.41	4.92**	2.04
Educational attainment				
No education	-	1.00	-	1.00
Primary	0.07	1.08	8.83**	1.71
Middle plus	0.01	0.95	0.22	1.22
Type of household				
Extended	-	1.00	-	1.00
Nuclear	0.00	0.99	8.48**	1.56
Marital status				
Married	-	1.00	-	1.00
Divorced/widowed	1.32	3.62	0.39	0.80
Never married	1.69	3.13	0.14	1.57
Migrant status				
Non migrant	-	1.00	-	1.00
Migrant	0.08*	1.08	0.91	0.85
Labour force status of spouse of head				
Not economically active	-	1.00	-	1.00
Spouse absent	1.69	0.53	5.87**	0.55
Economically active	2.81	1.84	15.22**	2.21

* p < .10; ** p < .05

**Table 16-2: Determinants of Employment, Female Household Heads, Rural Maldives.
Estimates from Logistic Models**

Independent variables	Age of household head 15 to 34 (n = 1771)		Age of household head 35 to 59 (n = 1864)	
	Wald statistic	Odds ratio	Wald statistic	Odds ratio
Intercept	5.52**	-	7.03**	-
Number of persons under 15 in household	0.68	0.97	25.16**	0.87
Island economy				
Tourism	-	1.00	-	1.00
Mixed	0.03	1.04	11.91**	1.92
Fishing	0.01	1.02	6.12**	1.49
Tourism and fishing	0.28	1.16	5.44**	1.81
Agriculture	13.30**	3.27	27.10**	4.86
Island zone				
Within zone	-	1.00	-	1.00
Periphery of zone	0.19	1.13	0.37	1.16
Outside zone	0.26	0.89	0.74	1.18
Distant from zone	10.10**	0.45	0.62	0.85
Educational attainment				
No education	-	1.00	-	1.00
Primary	0.05	1.03	0.08	1.03
Middle plus	6.59**	1.70	3.69**	2.34
Type of household				
Extended	-	1.00	-	1.00
Nuclear	0.84	0.90	13.52**	0.67
Marital status				
Married	-	1.00	-	1.00
Divorced/widowed	6.10**	1.81	6.20**	1.54
Never married	0.75	1.41	0.00	1.00
Migrant status				
Non migrant	-	1.00	-	1.00
Migrant	4.03**	1.34	2.34	1.22
Labour force status of spouse of head				
Not economically active	-	1.00	-	1.00
Spouse absent	0.59	1.35	3.91**	1.90
Economically active	0.65	1.37	5.25**	2.13

* p < .10; ** p < .05

Table 16-3: Determinants of Employment, Male Child/Stepchild of Head, Rural Maldives. Estimates from Logistic Models (Economically active vs not active)

Independent variables	Age of child/stepchild 15-24 (n = 539)		Age of child/stepchild 25-59 (n = 577)	
	Wald statistic	Odds ratio	Wald statistic	Odds ratio
Intercept	26.98**	-	11.85**	-
Number of persons under 15 in household	6.09**	0.86	0.01	0.99
Island economy				
Tourism	-	1.00	-	1.00
Mixed	2.61	0.51	0.91	0.62
Fishing	0.96	1.41	0.19	1.21
Tourism and fishing	0.00	1.01	0.01	0.95
Agriculture	0.08	0.84	0.77	0.52
Island zone				
Within zone	-	1.00	-	1.00
Periphery of zone	7.39**	0.19	0.24	0.73
Outside zone	3.90**	0.34	1.88	0.49
Distant from zone	7.55**	0.21	3.06*	0.36
Educational attainment				
No education	-	1.00	-	1.00
Primary	1.15	1.39	3.89**	2.04
Middle plus	1.72	1.53	1.51	1.73
Type of household				
Extended	-	1.00	-	1.00
Nuclear	0.32	0.86	0.02	0.96
Marital status				
Married	-	1.00	-	1.00
Divorced/widowed	4.54**	0.21	2.63	0.55
Never married	18.37**	0.16	7.98**	0.37
Migrant status				
Non migrant	-	1.00	-	1.00
Migrant	2.02	1.57	0.94	0.76
Sex of household head				
Female	-	1.00	-	1.00
Male	2.35	0.63	0.01	0.97
Educational attainment of head				
No formal education	-	1.00	-	1.00
Some education	1.25	0.74	1.92	1.76
Labour force status of head				
Not in labour force	-	1.00	-	1.00
Economically active	5.66**	2.09	2.38	1.57

* p < .10; ** p < .05

Table 16-4: Determinants of Employment, Female Child/Stepchild of Head, Rural Maldives. Estimates from Logistic Models (Economically active vs not active)

Independent variables	Age of child/stepchild 15-24 (n = 985)		Age of child/stepchild 25-59 (n = 680)	
	Wald statistic	Odds ratio	Wald statistic	Odds ratio
Intercept	8.19**	-	2.76*	-
Number of persons under 15 in household	7.08**	0.90	4.98**	0.89
Island economy				
Tourism	-	1.00	-	1.00
Mixed	2.76*	0.63	0.05	0.93
Fishing	0.04	0.96	0.04	1.06
Tourism and fishing	1.97	1.61	2.03	1.87
Agriculture	0.06	0.92	0.86	1.66
Island zone				
Within zone	-	1.00	-	1.00
Periphery of zone	0.05	1.08	0.10	0.89
Outside zone	1.18	0.75	0.01	0.97
Distant from zone	1.23	0.72	2.06	0.59
Educational attainment				
No education	-	1.00	-	1.00
Primary	0.03	1.04	1.73	1.34
Middle plus	2.29	1.38	12.46**	2.78
Type of household				
Extended	-	1.00	-	1.00
Nuclear	1.42	1.25	1.54	0.62
Marital status				
Married	-	1.00	-	1.00
Divorced/widowed	6.90**	1.89	7.92**	1.82
Never married	0.02	1.03	0.77	1.41
Migrant status				
Non migrant	-	1.00	-	1.00
Migrant	15.54**	2.29	2.37	1.44
Sex of household head				
Female	-	1.00	-	1.00
Male	7.17**	0.64	10.50**	0.54
Educational attainment of head				
No formal education	-	1.00	-	1.00
Some education	0.05	0.96	0.23	0.90
Labour force status of head				
Not in labour force	-	1.00	-	1.00
Economically active	47.24**	3.60	21.61**	2.54

* p < .10; ** p < .05

16.1.1 Distance of Island to Tourism Zone

It can be seen from Table 16-1 and Table 16-2 that in the rural areas, the chances of being in the labour force appear to be higher for male household heads in islands 'distant' from the tourism zone than for those 'within' the tourism zone but lower for male household heads in zones other than the 'distant' zone in relation to tourism zone islands. However, it is statistically significant only in the case of the 'distant' from zone islands. The likelihood of male household heads of both age groups in the 'distant' to zone islands to be economically active is over twice that of male household heads in the 'within' zone islands ($p < .10$ for household heads aged 15–34 and $p < .05$ for household heads aged 35–59). The reasons for the high likelihood of employment for males in the 'distant' zone islands are discussed later in this chapter.

For female household heads, the only statistically significant relationship between their labour force participation and the location of island of residence is for those household heads aged 15 to 34 in 'distant' from tourism zone islands. For them, the likelihood of being economically active is 55 percent lower ($p < .05$) than for women of similar ages in islands 'within' the tourism zone.

There also appears to be a negative relationship between the labour force participation of children and stepchildren of the household head and the location of the island in relation to the tourism zone (Table 16-3 and Table 16-4). This relationship is true for both sexes although it is statistically significant only for males aged 15 to 24 in all zones and males aged 25 to 59 in 'distant' from zone islands. For male children in the age group 15 to 24, their likelihood of being in the labour force in comparison to a similar aged child or stepchild of head in a 'within' tourism zone island is, 81 percent lower ($p < .05$) if they are in a 'periphery' of tourism zone island; 66 percent lower ($p < .05$) if they are in a 'outside' the tourism zone island; and 79 percent lower ($p < .05$) if they are in a 'distant' from zone island. Similarly, a male child or stepchild aged 25 to 59 in a 'distant' from zone island is 64 percent less likely

($p < .10$) to be economically active than a person with similar characteristics in a 'within' zone island.

It appears from these observations that the labour force participation of male household heads in the islands outside the tourism zone, more specifically the 'distant' from zone islands, are distinctly higher than those in the islands 'within' the zone. As we have discussed in Part B of this thesis, the workers laid off from the Royal Air Force base in Gan, in the southernmost atoll of the Maldives, provided a large proportion of the initial tourism industry workforce. The continuing high participation of people of these atolls in the tourism sector employment, and the semi-urban nature of these islands with relatively large numbers of employment opportunities within the atoll, and the positive attitudes towards wage employment are likely to be some of the reasons for high likelihood of labour force participation in these atolls. On the other hand, the lower likelihood of female employment in these atolls is probably directly related to high levels of male labour force participation.

16.1.2 Nature of Island Economy

It appears that in the rural areas of the Maldives there is a tendency for young male household heads from islands other than predominantly tourism income oriented islands to have higher levels of economic inactivity. Older males in these islands, on the other hand, are more likely to be in the labour force than their peers in the tourism income oriented islands. However, these relationships were not always statistically significant.

A male household head in the age group 15 to 34 in a mixed economy island is 72 percent less likely than their peers in tourism income oriented islands to be in the labour force ($p < .05$). Similarly, a male household head aged 15 to 34 in an agriculture-oriented island is 82 percent less likely ($p < .05$) than a male household of the same age group in a tourism oriented island, to be economically active. On the other hand, a male household head in the age group 35 to 59 in a fishing oriented island is twice more likely ($p < .05$) to be in the labour force than a similar aged male household head in a tourism

oriented island and a male household head in the same age group in a tourism and fisheries island is also twice more likely ($p < .10$) to be in the labour force than a similar aged male household head in a tourism oriented island.

The most interesting patterns of the relationship between an individual's labour force participation and the island economy are seen for females of all age groups in the rural areas. Female household heads are more likely to be in the labour force if they are in an island other than the tourism zone. Irrespective of age group, females in agricultural islands are more likely than women in any other type of island to be in the labour force. A woman in the age group 15 to 34 is 3.3 times more likely ($p < .05$) and a woman in the age group 35 to 59 is 4.9 times more likely ($p < .05$) than women in respective age groups in tourism economy islands to be in the labour force.

These relationships reflect several important factors of the Maldivian labour force. Firstly, the gender biases in labour force participation in the rural Maldives is reflected in the relatively lower likelihood for younger male household heads to be involved in economic activity when the main activity of the island is non tourism oriented and the corresponding higher odds of female household heads to be economically active in these islands. This pattern is probably caused by the restrictions on females to seek employment outside their home islands. Reluctance of parents to send their daughters away either for employment or training lies in their perception that girls are physiologically more vulnerable than boys. The following accounts of parents illustrate this point:

I think people are very reluctant to send girls for employment outside the island...even if they do not find employment in the island they do not look for jobs outside the island...I think it is because it may be more difficult for girls to go and work outside the island like boys do...I don't think it is because people believe that girls are inferior to boys and that they should stay home...I don't think any one in this island has that kind of attitude (male household head aged 60, Mahibadhoo island).

I will not be happy to send a girl to work in another island...for boys, there is nothing that I have to fear but when they are grown up they will be able to think for themselves and if the only alternative for good employment is outside the island then they will be able to make the

decision for themselves....my fear is for their safety...that they may be physically harmed by someone (43 year old father of school aged children, Mahibadhoo island).

Secondly, this point is further highlighted by the significantly higher chances of female labour force participation in agriculture-oriented islands, which shows the relative importance of agriculture for women's employment in the rural Maldives. While agriculture is not an important sector of the economy at the macro-level, the high labour force participation of women in agriculture islands and the low ranking of these islands in terms of the Index of household levels of development (IHD) suggest the low economic status of women in the rural Maldives.

It also appears that there is a growing trend for younger persons in the rural areas to move away from traditional activities such as fishing, agriculture, and similar rural activities towards the more lucrative employment opportunities offered by the tourism and related sectors of the economy. The above analysis suggests that younger males are likely to be leading this trend. Analysis of the determinants of labour force participation of children and stepchildren of the head of household does not yield significant relationships.

16.1.3 Number of Household Members Aged Less Than 15

It appears that the dependency levels in a household have a weak but positive effect on the labour force participation of older male household heads. For every additional member under the age of 15 in the household, the odds ratio of being economically active for a male household head in the age group 35 to 59 increases 1.2 times ($p < .05$). On the other hand, for a female household in the same age group, the chances of being in the labour force decline by 13 percent ($p < .05$) with every additional member under the age of 15 in the household. Although similar patterns of the relationship are true for younger males and females they are not statistically significant. However, there appears to be a significant negative relationship between the labour force participation of younger children of the household head and the number of household members under the age of 15, irrespective of sex.

These relationships show that the number of children in the dependent ages in the household negatively affects the labour force participation of rural females, while it has a positive effect on the labour force participation of rural males. These opposing directions of the relationship for males and females show the clear-cut differences in the roles of men and women in the Maldivian society. While increasing dependency in the household pushes the men into the labour force, it is likely to push women out of the labour force.

16.1.4 Type of Household

Being in a nuclear family as opposed to an extended family affects the labour force participation of males and females differently. While the family type does not appear to be an important factor for the labour force participation of younger household heads, or for the children of the household head, it has a significant effect on the labour force participation of older household heads. For male household heads aged 35 to 59, the likelihood of being economically active is 1.56 times ($p < .05$) greater if the household is a nuclear family as opposed to an extended family household, while for a female household head in the age group 35 to 59, being in a nuclear family makes it 33 percent less likely ($p < .05$) for her to be economically active than if she was in an extended family.

A nuclear household headed by a female is likely to be supported by the income remitted by an absentee spouse working away from the home island, most probably in the urban area. Thus, the effects of economic independence of the nuclear family and the ability of the husband to be engaged in modern sector employment increases the likelihood of the female household head, in a nuclear family household, of remaining out of the labour force for reasons of social status. To illustrate this point, the author draws from the weekly radio interviews conducted by the local radio station in Male island with island folks from inter-atoll transfer boats in Male' harbour. These interviews are conducted every Friday afternoon and broadcast live on air so that they are able to talk about various aspects of island life live on radio. On several occasions when asked what the women folk do in the island they come from, it is often

reported (with much pride) that, since men are able to earn enough income to support their families there is no need for their women folk to work for income. Rather, they just take care of the family and relax.

On the other hand, a nuclear family household is likely to be set up usually after achieving some degree of financial independence from the extended family, thus making the male household head more likely to be economically active, as access to modern sector employment is mostly restricted to males in the Maldives. Thus, a male household head is more likely to be economically active if he were in a nuclear family household than if he was in an extended family household, where he is likely to get the support of other economically active members of the family.

16.1.5 Level of Educational Attainment

There appears to be a positive relationship between one's level of educational attainment and employment status in the rural areas of the Maldives. However, this relationship is statistically significant only for male household heads aged 35 to 59. It seems that educational attainment is more closely associated with female labour force participation than it is for males in the rural Maldives.

A male household head aged 35 to 59 with primary education is 1.7 times more likely ($p < .05$) than a similar aged male household head with no education to be in the labour force. For male household heads in this age group with middle or higher education the relationship is positive but weak and not statistically significant.

For a female household head in the age group 15 to 34 with middle or higher level of education, the chances of being in the labour force is 1.7 times higher ($p < .05$) than that for a similar aged female household head with no education. Similarly, for a female household head aged 35 to 59 with a middle or higher level of education, the chances of being in the labour force is 2.3 times more ($p < .05$) than that for a female household head in the same age group with no education. Educational attainment does not appear to be an important factor in the labour force participation of children of the household head.

The more consistent relationship between educational attainment and labour force participation for females is probably due to differences in the types of employment between males and females in the rural areas. While males are employed in more manual types of work such as fishing, construction, and transport, females are encouraged towards more knowledge-oriented activities such as teaching and office work.

16.1.6 Marital Status

Related to age and education is the marital status of an individual (see for instance Jones, 1997a). Marital status does not appear to be an important factor in determining the labour force participation of the household head except for divorced/widowed female household heads. A female household head aged 15 to 34 is 1.8 times more likely to be in the labour force ($p < .05$) if she is divorced/widowed (as opposed to currently married). For older female household heads (aged 35 to 59) the corresponding odds ratio is 1.5 ($p < .05$).

These results point out a significant social problem in the Maldives. While it is required by law for a man to continue providing financial support to his children after the dissolution of a marriage, non-compliance has been a widespread problem (Haveeru Daily Online, 1999). It is probably because of financial hardships caused by such problems that most divorced women are forced into the labour force.

16.1.7 Lifetime Migration Status

Migration appears to have a positive effect on the labour force participation of household heads. The relationship is statistically significant only for female household heads aged 15 to 34 years, although older females with a p -value of 0.13 provides some support for the positive relationship.

A female household head in the age group 15 to 34 is 1.3 times more likely ($p < .05$) to be economically active if she has ever lived elsewhere. It can also be seen from Table 16-3 and Table 16-4 that a similar relationship is true for children and stepchildren of the household head. A female child of head aged

15 to 24 is 2.4 times more likely ($p < .05$) to be in the labour force if she is a lifetime migrant. This trend is expected as those rural residents who reported to have lived elsewhere for at least one year during their lifetime are likely to have lived in the urban area and urban exposure means possibly new skills and therefore higher chances of employment.

16.1.8 Labour Force Status of Spouse

Labour force status of spouse appears to have a positive effect on the labour force participation of the head of household, irrespective of sex. A male household head aged 15 to 34 is 1.8 times more likely to be economically active when the spouse is economically active. There is no statistically significant association for younger female household heads. Similarly, a male household head aged 35 to 59 is 2.2 times more likely to be economically active ($p < .05$) if his spouse is economically active and a similar aged female household head is 2.1 times more likely to be economically active ($p < .05$) if her spouse is economically active.

This seems to contradict the earlier arguments that females are encouraged to be out of the labour force if the household income permits it. However, the greater likelihood of older female household heads to be economically active in extended family households than nuclear family households probably explains the present finding. It is possible that older female household heads in extended family households are more likely to be economically active as they are more likely to have opportunities for employment in non-agricultural activities such as, home based basic religious instruction, production of savouries for sale, tailoring and embroidery work and other similar activities. Such opportunities may arise because of the larger pool of household members that are able to contribute to such work, ability of grown up children to provide the basic investment, and also the ability of the household to market such products.

Further observations on the determinants of employment at the level of the household members are made from the models of labour force participation of

the children and stepchildren of the household head. These are the independent effects of some household head characteristics such as sex, educational level and labour force participation of the household head on the labour force participation of their children and stepchildren.

Sex of the household head appears to have some effect on the labour force participation of the children/stepchildren. It seems that children of male household heads are less likely to be economically active than children of female household heads. This relationship is statistically significant only for female children.

The level of educational attainment of the household does not appear to have a consistent effect on the likelihood of labour force participation of their children. Wherever there is a statistically significant relationship it appears to be strong and positive.

Labour force participation of household head appears to have a positive effect on their children's labour force participation. A younger male child is 2.4 times more likely ($p < .05$) to be economically active if the household head is economically active. A younger female child is 3.6 times more likely ($p < .05$) to be economically active if the household head is economically active. For older male children the chances are 1.5 ($p = .12$) and for older female children 2.5 ($p < .05$).

16.2 The Urban Context

Having seen the relationships between individual household heads and various macro and micro-level socio-economic and demographic factors in the rural Maldives, we will now investigate the relationships between these variables among the urban households of the Maldives, in order to see if there are any significant differences in the relationships between the rural and the urban populations. For reasons mentioned in Chapter 14, it will not be possible to look at macro-level economic factors for the urban population. The following discussions will, therefore be based on micro-level interactions between the labour force participation of household heads and various socio-economic

characteristics in the urban area. The discussion will be based on the statistical analysis presented in Table 16-5.

Table 16-5: Determinants of Employment, Household Head, Urban Maldives. Estimates from Logistic Models

Independent variables	Male household heads (n = 727)		Female household heads (n = 759)	
	Wald statistic	Exp(B)	Wald statistic	Exp(B)
Intercept	2.83**	-	0.57	-
Number of persons under 15 in household	0.02	1.01	5.41**	0.90
Educational attainment				
No education	-	1.00	-	1.00
Primary	1.55	1.70	0.01	1.03
Middle	1.30	1.81	4.12**	1.64
Secondary plus	5.98**	6.25	24.89**	3.76
Type of household				
Extended	-	1.00	-	1.00
Nuclear	1.92	1.70	1.53	0.79
Marital status				
Married	-	1.00	-	1.00
Divorced/widowed	0.90	0.43	10.44**	2.30
Never married	0.01	0.90	1.15	2.14
Lifetime migrant status of individual				
Non migrant	-	1.00	-	1.00
Migrant	6.96**	2.67	0.55	0.88
Labour force participation of spouse of head				
Not economically active	-	1.00	-	1.00
Economically active	0.60	1.42	0.05	0.91
Spouse absent	0.38	1.63	0.46	0.76

* p < .10; ** p < .05

Unlike in the rural areas, analysis of the relationships between the labour force participation of children and stepchildren of the household head in the urban area does not reveal any significant factors that are different from the household head model shown in Table 16-5. Furthermore, none of the household head characteristics appear to be important for the labour force participation of children and stepchildren of head. Therefore, the results of the child/stepchild model for the urban area are not shown. In order to avoid repetition, detailed discussions of the urban employment model will focus on the aspects of urban employment that are different from the rural findings.

The relationship between the household type and the labour force participation of the household head is not so evident in the urban area. It appears that male household heads of nuclear family households are more likely to be economically active than those of extended family households. On the other hand, female household heads are less likely to be in the labour force if they are in a nuclear family household as opposed to an extended family household. Although none of these relationships are statistically significant, they nevertheless support the findings from the rural households.

Similar to rural findings, there appears to be a strong positive relationship between the level of educational attainment and labour force participation of the household head in the urban area. However, this relationship is statistically significant only for male household heads with a secondary or higher level of educational attainment and for female household heads with a middle school level and higher levels of educational attainment.

As was the case for rural findings the relationship between marital status and labour force status are different for males and females in the urban area. Compared to a currently married male household head never married and divorced or widowed male households heads are less likely to be in the labour force (not statistically significant).

Lifetime migrant status of male household heads in the urban area is positively related to labour force participation while it appears to be negatively associated with the labour force participation of female household heads. A male migrant household head is 2.67 times more likely ($p < .05$) to be economically active than an urban born male household head. The relationship for female household heads is not statistically significant.

The relationship between labour force participation and lifetime migrant status appears to be different for the children/stepchildren of the head of household, than for the household heads themselves, in the urban area. Both, male and female children are less likely to be in the labour force if they are migrants as opposed to non-migrants. A male migrant child is 57 percent less likely ($p <$

.05) to be in the labour force than a male non-migrant child. Similarly, a female migrant child is 43 percent less likely ($p < .05$) to be in the labour force than a female non-migrant child.

It appears that, the main purpose of migration for rural to urban migrants being employment, migrant heads of households in the urban area are more likely to be in the labour force than urban born household heads. With the possibility of income from properties and support from the economically active members of the extended family being greater for urban born household heads than migrant household heads, the chances are higher for urban born household heads to remain out of the labour force.

16.3 Discussion

Analysis of the relationships between economic activity status and various socio-economic and demographic characteristics of individuals by urban and rural areas of the Maldives show several important macro and micro-level factors that are associated with the labour force participation of individuals in the Maldives. While most of the relationships are in the expected direction, some factors may be typical to the study population.

At the macro-level, the geographical location of the island is important in determining an individual's labour force participation. In relation to males in islands located in the tourism zone, those in the 'distant' to zone islands appear to be more active. The relatively higher likelihood of labour force participation of males in these islands probably reflect the positive attitudes towards wage employment created by the early introduction of wage employment in these atolls by the existence of the Royal Air Force base in Gan. Females, on the other hand, are relatively less likely to be economically active if they live in a 'distant' to zone island compared to 'within zone' islands. This is reflective of the negative association between labour force participation of women and the level of household income, as a large number of people from these islands are employed in the tourism sector (see Mencher, 1988). Further support for this

argument is seen from the relationship between the type of economic activity and the labour force participation of women.

Females in tourism-oriented islands are lowest in their chances of being economically active. It appears that economic well being of a household deters females from active participation in the labour force. For younger males, it seems that tourism sector employment is the most attractive area of economic activity. Older males are less likely to be employed, if they are in tourism-oriented islands and so are females, both younger and older.

The superior economic rewards offered by the tourism sector employment may be the cause of higher chances of economic inactivity of older male household heads and female household heads of all ages in tourism oriented islands. It is likely that these inactive members may be depending on the younger, economically active members of the household for economic support.

The high likelihood of rural females in agricultural islands to be economically active suggests that agriculture remains an important economic activity for rural women in the Maldives. It is in these islands that women have the highest chances of being economically active. Agriculture being an underdeveloped and a relatively insignificant sector of the Maldivian economy, this suggests the low economic status of women in the rural Maldives.

It seems that there is an 'encouragement effect' on the labour force participation of individuals at the level of the household. Economically active household heads appear to encourage their male children to be active members of the labour force.

The analysis also reveals a clear negative relationship between the number of dependent age members in a household and the labour force participation of women but the relationship is less definitive for males where it is negative for younger males and positive for older males. This probably suggests the clear-cut roles of males and females in childcare in the Maldivian society.

The financial support from an absentee spouse is likely to discourage female household heads in nuclear family households from participation in the labour force. While being in a nuclear family household, a male household head is less likely to receive support from the members of the extended family; pressures are put on male household heads of nuclear families to be economically active. It appears that while the extended family system provides a social security net for those members of such households that are not in the labour force, older female household heads in extended family households are more likely to be economically active than female household heads of nuclear families. This is perhaps because there is an expectations by the members of extended family households for such support.

The analysis also shows that marriage is a strong motivating factor for males to seek employment while it acts as a deterrence for the labour force participation of females. The greater likelihood of divorced or widowed females in the higher age groups to be in the labour force than any other marital status group suggests that it is only with the lack of financial support from a male that females in the older ages are more likely to become economically active.

The level of educational attainment appears to be a significantly positive factor for the labour force participation of male household heads and female household heads, both in the urban and the rural areas of the Maldives. There is also some link between the educational attainment of the household head and the labour force participation of children of the head. More educated household heads are likely to encourage their children to be economically active, as they are more likely to be able to match the job opportunities and the children's job aspirations through their connections with employers.

The present analysis also shows that lifetime migrants both in the rural and the urban areas are more likely than non-migrants to be economically active. The exceptions are migrant female household heads in the urban area. The reasons for the observed direction of the relationship may be different in the rural and the urban areas. While urban exposure and higher skills may be important in the rural areas, relatively higher costs of living for rural to urban migrants

compared to the urban born may be more important in the urban area. Female household heads that have migrated from the rural to urban areas are likely to possess relatively lower educational attainments compared to their urban-born counterparts. This is probably an important factor in determining their chances of labour force participation in the urban area. Another factor may be that female migrants are less likely to find the desired types of employment outside the home in the urban area (Boserup, 1970; see also Standing, 1978 for criticisms of this view).

The above findings are consistent with the theoretical literature presented at the beginning of this chapter. They provide support to the strength of the arguments and to the robustness of the estimates presented.

Chapter 17: Determinants of Development at the Level of the Household

In the last three chapters we have examined the linkages between various socio-economic factors of the households and individuals on their fertility, human capital and employment. This chapter looks at the relationship between household level of development and various socio-economic characteristics of the households including the human capital of household heads, their employment, household dependency levels, and other socio-economic factors in the Maldives. Two separate samples – a rural sample and an urban sample – are investigated independently.

17.1 The Rural Context

Analyses of the effects of the various micro and macro-level socio-economic factors on household level development in the rural areas of the Maldives are performed by controlling for the age of the head of the household. For the purposes of the present chapter, the age of the household head is grouped into three broad age groups depicting three stages in the adult life cycle: the young adult (15 to 29), the mature adult (30 to 49), and the older adult (50 and over). These broad age groupings are important because they approximately represent three stages in an adult's life. The young adult is the stage where one's career choices are made and most of the family formation takes place. The mature adult is the stage where most of the child rearing and accumulation of wealth takes place. The older adult is where the children are grown up and the transition from economic activity to retirement takes place (see for instance Clausen, 1986 for a similar classification). While it is recognised that the present age groupings may not necessarily be an accurate reflection of the various life-cycle stages in the present context⁶⁰, it is assumed that they are fairly representative of the economic life-cycle stages of Maldivian adults.

⁶⁰ For example there is no fixed retirement age and most people are economically active for as long as their health permits it.

In the first stage, for many people, lack of experience puts them in lower levels of the job hierarchies. Their income levels remain low compared to the more experienced and mature age groups. In addition to this, this age group is also exposed to the child bearing and family formation stages demanding high levels of expenditure, leaving little opportunity for investment in housing and accumulation of consumer durables.

In the second stage most of them are in their peak earning capacities and thus more capable than the younger household heads to save and invest in the construction of better quality housing and the purchase of consumer durables. Although it is also true that the children of those in these age groups being in higher levels of schooling are likely to demand higher expenses for schooling in terms of text books and school fees, the high incomes of these families are likely to offset these costs allowing more savings for investment.

The age group 50 years and over are likely to be heads of households with grown up, and in many cases, economically active children, living in extended families. They have already gone through the stage of saving and investment themselves and are assisted by their grown up children in improving the household level of living of the extended family. Such cases have been found in the qualitative interviews conducted by the author in selected islands of the Maldives during the period December 1998 to February 1999.

Using these broad age groups to control for the life cycle stage effects of household heads, the regression analyses of household level of living as indicated by the IHD⁶¹, on several household and macro-level socio economic and demographic variables, reveal several interesting findings. The dependent variable, IHD is categorised into three levels as indicated by the household possession of certain consumer durables and some aspects of the quality of

⁶¹ The use of this index as a measure of household level of development may pose some measurement problems, as it is not a per capita measure of household wealth (Musgrove, 1980). However, since our interest is in the joint ability of the household to access a given standard of living as defined by the composite index, it is expected that this problem would be minimised although this is an issue that should be borne in mind when interpreting the results of the analysis.

housing – High IHD, Medium IHD, and Low IHD. The reference category or the base level for the regression models is the Low IHD category. For a detailed discussion of how the variable was developed refer to Annex 3. The results of the regressions for the rural sample are presented in Table 17-1 and Table 17-2. Perhaps the most significant finding is the importance of the tourism industry for the development of levels of living at the household level in the Maldives. The two macro-level socio-economic variables; the distance of a given island to the tourism zone, and the nature of the island economy as indicated by the proportions of persons of a particular island employed in a given sector, show strong positive correlation with the household level of development.

Table 17-1: Determinants of Household Level of Development - High versus Low (base level), rural Maldives. Estimates from Multinomial Logistic Models

Variable name	Age of household head < 30 (n = 1404)		Age of household head 30-49 (n = 3656)		Age of household head 50 + (n = 1318)	
	Wald statistic	Odds ratio	Wald statistic	Odds ratio	Wald statistic	Odds ratio
Intercept	0.13	-	0.65	-	0.56	-
Number of persons under 15 in household	3.30*	1.10	0.09	0.99	11.17**	1.15
Island zone						
Within zone	-	1.00	-	1.00	-	1.00
Periphery	2.95*	0.51	21.99**	0.37	13.76**	0.28
Outside	20.70**	0.25	70.80**	0.25	30.54**	0.23
Distant	14.18**	0.28	30.82**	0.36	15.29**	0.32
Island economy						
Tourism	-	1.00	-	1.00	-	1.00
Mixed	9.59**	0.41	10.09**	0.58	5.08**	0.52
Fishing	28.14**	0.28	39.01**	0.42	14.99**	0.43
Tourism+fishing	17.22**	0.12	22.81**	0.31	5.92**	0.38
Agriculture	5.24**	0.34	19.67**	0.28	7.04**	0.35
Type of household						
Extended	-	1.00	-	1.00	-	1.00
Nuclear	12.68**	0.51	30.38**	0.56	9.75**	0.54
Sex						
Female	-	1.00	-	1.00	-	1.00
Male	0.66	1.18	1.87	1.16	7.26**	1.58
Migrant status						
Non migrant	-	1.00	-	1.00	-	1.00
Migrant	0.26	1.11	8.42**	1.39	3.27*	1.39
Educational attainment						
No education	-	1.00	-	1.00	-	1.00
Primary	0.24	1.10	5.51**	1.28	0.52	1.14
Middle plus	7.05**	1.94	27.31**	3.53	6.41**	4.21
Active members						
One	-	1.00	-	1.00	-	1.00
None	0.58	1.17	4.22**	1.34	3.88**	0.51
Two	0.90	1.25	2.67	1.23	0.19	0.91
Three or more	13.46**	3.02	31.98**	2.32	22.52**	2.64

* p < .10; ** p < .05

Table 17-2: Determinants of Household Level of Development - Medium versus Low (base level), rural Maldives. Estimates from Multinomial Logistic Models

Variable name	Age of household head < 30 (n = 1404)		Age of household head 30-49 (n = 3656)		Age of household head 50 + (n = 1318)	
	Wald statistic	Odds ratio	Wald statistic	Odds ratio	Wald statistic	Odds ratio
Intercept	1.30	-	0.99	-	0.82	-
Number of persons under 15 in household	12.07**	1.20	17.46**	1.13	10.05**	1.15
Island zone						
Within zone	-	1.00	-	1.00	-	1.00
Periphery	0.23	0.82	14.79**	0.44	0.16	0.87
Outside	8.73**	0.38	32.96**	0.40	8.35**	0.42
Distant	6.29**	0.41	31.29**	0.35	7.92**	0.39
Island economy						
Tourism	-	1.00	-	1.00	-	1.00
Mixed	5.88**	0.51	17.09**	0.51	2.17	0.66
Fishing	24.27**	0.31	59.83**	0.34	21.40**	0.34
Tourism+fisheries	15.66**	0.10	28.30**	0.28	3.44*	0.46
Agriculture	8.15**	0.16	25.65**	0.24	8.41**	0.25
Type of household						
Extended	-	1.00	-	1.00	-	1.00
Nuclear	2.74	0.73	7.87**	0.75	2.14	0.75
Sex						
Female	-	1.00	-	1.00	-	1.00
Male	2.19	0.72	3.49*	1.21	0.05	1.04
Migrant status						
Non migrant	-	1.00	-	1.00	-	1.00
Migrant	0.02	1.03	0.01	1.01	0.06	1.05
Educational attainment						
No education	-	1.00	-	1.00	-	1.00
Primary	0.01	0.98	1.23	0.89	0.30	0.90
Middle plus	4.52**	1.73	18.17**	2.85	0.42	0.49
Active members						
One	-	1.00	-	1.00	-	1.00
None	0.01	1.02	0.68	1.12	1.76	0.67
Two	0.83	1.25	0.15	1.05	0.01	0.98
Three or more	14.27**	3.22	10.44**	1.64	1.60	1.33

* p < .10; ** p < .05

17.1.1 Distance from the tourism zone

The physical location of an island in relation to the tourism zone, as expected, appears to be an important determinant of the level of development or affluence of the island households. Households in islands 'outside' the tourism zone were less likely to have achieved high development (against low) than households 'within' the tourism zone. A similar relationship is found when comparison is made between medium IHD and low IHD.

Compared to households in islands located 'within' the tourism zone, those households in the atolls 'outside' the tourism zone are least likely of all households to have a high IHD. However, households in those islands located in the atolls 'distant' from the tourism zone are marginally better off than those 'outside' the zone when the household head is 30 years of age or older. Although these atolls are geographically more remote to the tourism zone than any other atoll group of the Maldives, the relatively higher levels of development in these atolls can be explained by the large numbers of people from these atolls employed in the tourism and supporting sectors in Male' island and the tourism zone⁶². The reasons for the high participation of the people from the southern-most atolls of the Maldives in the tourism sector employment and in employment in the urban centred activities have been discussed in detail in chapter 7 of this thesis.

The finding of higher chances for households in the 'distant' islands to have a high IHD than those in the other atolls outside the tourism zone provides some evidence to the argument that participation in the tourism sector employment benefits households in the rural areas. These benefits probably operate through the transfer of resources from the urban centred economic activities for the improvement of household levels of living in the rural areas.

The chances of a household in a given area of having a high IHD in relation to a household in the tourism zone varies with the age group of the household

⁶² See for instance the qualitative findings from the island of Maradhoo-Feydhoo which is located in the distant to zone atolls.

head. For households headed by a person aged less than 30 years, the chances of having a high IHD are 72 percent less ($p < .05$) if they are in 'distant' island as opposed to the tourism zone. On the other hand, for households in a 'distant' zone island and headed by a person aged 30 to 49 years, the odds ratio of having a high IHD is 64 percent lower ($p < .05$) than a household in the tourism zone with a head of the same age group. For a household with a head in the age group 50 years or older the corresponding chances are 68 percent ($p < .05$).

When a household's chances of having a medium IHD as opposed to a low IHD are compared, an interesting finding that emerges is that households located in islands at the periphery of the tourism zone atolls are not significantly different from those within the tourism zone, at least for the households headed by persons under age 30 and over age 50. It is thus apparent that the level of development of a household is strongly linked, not only to the geographic location of the island on which the household is located, but also to the age of the household head, suggesting that, while the geographical location is important, certain demographic characteristics of the household also play a role in determining whether a household is well off or not.

17.1.2 Nature of Island Economy

The nature of island economy is a composite categorical variable developed from the percentages of employed persons by primary industry of employment of individuals in each inhabited island of the Maldives. It is an island level variable intended to study the relationship between the dominant economic activity of the island to the development at the level of the household in that island. See chapter 13 for a detailed discussion on how the variable was developed.

As seen in Table 17-1 and Table 17-2 that the nature of island economy is one of the most consistently related variables to the household levels of development in the regression model. Irrespective of the age group of the household head and the type of economic activity, there is a strong and

statistically significant link between tourism sector employment and the level of household development. In relation to households in the tourism economy islands, households in all other types of islands are less likely to have a high IHD or a medium IHD (as opposed to low IHD).

Odds ratios, irrespective of the age group of household head suggest that apart from the tourism economy islands, mixed economy islands are the next most advantaged of the islands in terms of IHD. For instance, comparing households headed by persons aged less than 30 years of age, the chances of a household in a mixed economy island of having a high IHD as opposed to a low IHD is 59 percent less ($p < .05$) than a household in a tourism economy island. This is compared to 72 percent less for households in 'fishing' islands ($p < .05$), 88 percent less for households in 'tourism and fishing' islands ($p < .05$), and 66 percent less for households in 'agriculture' islands ($p < .05$).

Qualitative data from three islands in the three zones provide support to these findings. In the island of Maradhoo-Feydhoo in the 'distant' to zone atolls, 16 out of the 18 houses interviewed had at least one member working away in a tourist resort. In Mahibadhoo island located within the tourism zone, most houses were in one way or the other obtaining income from tourism; supplying fish for the resort consumption under contract, working on construction or maintenance activities in the resorts under contract, or in a very few cases employed as staff in the resorts. In the island of Fonadhoo located 'outside' the tourism zone, none of the houses interviewed had anyone employed in the tourism industry; most people were involved in government employment (see Appendix 2).

In addition to the macro (island) level socio-economic characteristics, eight micro (household) level socio-economic and demographic variables were included in the model. While four of these are related to the head of the household, irrespective of sex, there are four other variables representing the demographic characteristics of the household members.

17.1.3 Type of Household

As discussed in chapter 13, three types of households were identified in the census. They are nuclear households, extended family households, and institutional households. For the purposes of the present analysis only nuclear family households and extended family households are considered. Nuclear family households are those consisting of household head and spouse and their children and stepchildren and person or persons unrelated to the household head in any way. Extended family households are households that consist of members including and beyond the boundaries of nuclear households.⁶³

It can be seen in Table 17-1 and Table 17-2 that there is a significant relationship between type of household and the level of IHD at the high level in relation to the low level but at the medium level, although the relationship is in the expected direction, it is not statistically significant. Irrespective of the age group of the household head, a nuclear family household is less likely to be in the high level IHD than extended family households. The estimated odds ratios are, for households headed by persons under 30 years of age, 49 percent less likely ($p < .05$); for households headed by persons 30 to 49 years of age, 54 percent less likely ($p < .05$), and for households headed by persons 50 years and over, 56 percent less likely ($p < .10$). This suggests the importance of pooled resources from the members of the extended family for the improvement of household living conditions in the Maldives.

17.1.4 Number of Household Members Aged Less Than 15

It is expected that the ability of a household to save and invest will diminish as the numbers of household members in the dependent ages increase, assuming that they do not contribute to household income and that their expenses are borne by the earning member or members of the household. For demographic purposes age 15 is mostly taken as the upper limit of the dependent young age group (see for example, Shryock *et al.*, 1976:133).

63 A similar definition has been used by Burch, 1983

The number of household members under the age of 15 (with the highest value of this variable truncated at 6 and over due to the small numbers above that) is used as a continuous variable in the present model. The results show a somewhat surprising direction of the relationship; whenever there was a statistically significant association, the number of household members under age 15 was found to be positively related to the level of IHD. However, the relationship at the high level of IHD was significant for those households with a head under age 30 and those with a head aged 50 or over. At the medium level of IHD the relationship was slightly stronger and significant ($p < .05$) irrespective of the age group of the household head. However, even when the relationship was found to be significant, the strength of the relationship could only be said to be weak. It is possible that this weak relationship exists due to the prevalence of extended family system in the Maldives, where it is likely that more household members under the age of 15 may also mean that they belong to more than one nuclear family and thus more than one economically active person to support them. In such situations the pooled household resources is likely to result in a high IHD for the entire household. For households headed by persons 50 years or older those household members under the age 15 could be grandchildren. This is probably the reason for the stronger and statistically significant relationship for households headed by older persons.

17.1.5 Sex of Household Head

Sex of household head appears to have no significant effect on the household level of development in the rural Maldives. As seen in Table 17-1 and Table 17-2 although the likelihood of a household being in the high IHD level or the medium IHD level as opposed to the low IHD level appear to be in favour of households headed by a male, the relationship is only significant for those households headed by persons 50 years or older in the case of high IHD and those in the middle age group in the case of medium IHD. Even when the relationship is significant it is not very strong. The odds ratios are 1.58 ($p < .05$) and 1.21 ($p < .10$), respectively.

With high proportions of females out of the labour force (see chapter 10), one would question the lack of significant differences in the levels of IHD between female-headed households and male-headed households in the rural Maldives. The answer could be found in the observation that, out of 3287 households headed by married females, in the rural areas; only 1672 (50.8 percent) households had their spouses present in the household at the time of the census in 1995 (table not shown). Thus, it is likely that even in many of the households headed by females an absentee spouse, most probably employed in the urban sector, provides the family income, thereby minimising the differential effect in the levels of household income between male and female headed households. The following account of a female household head from the island of Maradhoo-Feydhoo illustrates this point:

I used to work in a garments factory before I got married. Now I do not do any income earning work. I look after the house and the family...my husband works in a resort as a waiter... my brother lives with us...who is at the moment not employed although he used to work in a resort job earlier (Source: 29 years old female from Maradhoo-Feydhoo).

Table 17-3: Percentage Distribution of Household Head by Sex According to Broad Age Groups, Rural Maldives, 1995.

Broad age of household head	Sex of household head		Total%	Total (n)
	Male	Female		
<30	25.21	74.79	100.00	1404
30-49	45.02	54.98	100.00	3656
50+	61.64	38.36	100.00	1318
Total	47.03	52.97	100.00	6378

Source: Computed by the author from census data

The observation of a statistically significant relationship between IHD and sex of household head for households headed by persons 50 years or over can be explained from Table 17-3. Unlike households headed by younger persons, over 60 percent of older household heads (50 years and over) are males.

17.1.6 Migration Status of Household Head

It is expected that in a country like the Maldives where the modern economic sectors are concentrated in one area, employment oriented internal migration would be a key medium of transfer of wealth to the households in the rural areas. This type of migration commonly referred to, as circular migration is a well-documented phenomenon, especially in developing countries when there are significant urban rural disparities in the levels of development and access to employment opportunities (see for instance, Young, 1984 and the references therein). Such patterns of migration have been observed in the island countries of the Pacific such as Solomon Islands, Kiribati and Tuvalu (Walsh, 1982; Hayes, 1993; Friesen, 1993; Bertram, 1999).

Since, as was shown in chapter 7, virtually all internal migration in the Maldives takes place between one's place of birth and the urban area, lifetime migration status (defined as whether a person has ever lived away from the place of enumeration for a period of one year or more at any point in their lifetime – see chapter 7) can be taken as a proxy for one's prior employment in the urban area of the country. In the case of younger persons, having lived in the urban area could also mean that the reason for migration was mainly for the purposes of education or training. However, since the concern here is the lifetime migration status of the household head, it is assumed that the latter effect would be minimal. Even if education was the only reason for having lived in the urban area, the effect of education is likely to be positive on the level of IHD through their ability to secure better jobs in the rural areas.

As can be seen in Table 17-1 and Table 17-2, lifetime migration status of household head is related to the level of IHD for those households headed by persons 30 years or over. In fact, a household headed by a lifetime migrant in the age group 30 to 49 is 39 percent more likely ($p < .05$) than a household headed by a non-migrant in the same age group to be in the high IHD category, and so is a household headed by a lifetime migrant in the ages 50 and over, although this relationship is statistically significant at $p < .10$.

Table 17-4: Percentage Distribution of Households by Level of IHD and Broad Age Group of Household Head, Rural Maldives

Broad age of household head	Index of Household level of Development			Total%	Total (n)
	High	Medium	Low		
<30	14.06	13.99	71.95	100.00	1404
30-49	16.25	16.63	67.12	100.00	3656
50+	17.11	14.88	68.01	100.00	1318
Total	16.14	15.55	68.31	100.00	6378

Source: Computed by the author

Migration status of the household head is not important for those households headed by persons under 30 years of age, nor is it important in determining the likelihood of any type of household being in the medium IHD category. As seen in Table 17-4, relatively higher proportions of households headed by younger persons are in the low IHD category and fewer proportions in the high IHD category. This probably stresses the significance of the relationship between one's ability to save and invest in relation to the stage of life cycle that one is in.

17.1.7 Level of Educational Attainment of Household Head

Educational attainment of individuals, used as a measure of the level of human capital in this thesis has been found to be a useful measure of the level of human capital (see for instance Barro and Lee, 1993). The positive relationship between economic growth and human capital has been well documented in development literature (Ogawa, Jones and Williamson, 1993; Barro, 1989; Barro and Lee, 1993,). At the micro (household) level, the micro-economic theories of fertility (Becker, 1960, 1980; Becker and Lewis, 1973; Hanushek, 1992; Robinson, 1997) imply the positive link between education and household income levels.

The level of educational attainment of the household head is used as an indicator of the level of household human capital in the present model. Since household head is not necessarily the most educated person in a household, and in many cases may not necessarily be the household breadwinner, it is likely that using the educational attainment of household head may lead to misrepresentation of the actual level of human capital in a household.

However, in the absence of a better indicator of household level of human capital from the available data, it is assumed that this will be a meaningful measure of the average level of household human capital.

The present analysis shows that the household level of development is positively related to the level of educational attainment of the household head in the rural Maldives (Table 17-1 and Table 17-2). The positive relationship exists across all age groups of the household head, although it is not always statistically significant. Whenever there is a statistically significant relationship it is highly significant and strong. It can also be seen that higher the level of schooling, the stronger the relationship is.

In terms of the likelihood of a household being at a particular level of IHD, a household headed by a person under 30 years of age with a middle or higher level education is almost twice more likely ($p < .05$) than a household headed by a person in the same age category with no formal schooling to have a high IHD. As the age group of the household head increases the likelihood of a household being in the high IHD category also strengthens with higher levels of schooling. For instance, when the age group of the household head is 30 to 49 the chances of a household to be in the high IHD category (as opposed to low) is 3.5 times greater ($p < .05$) if he or she has a middle school or a higher level of schooling as opposed to no formal schooling. The corresponding odds ratio for a household headed by an older person is 4.2 ($p < .05$). It is likely that the positive association between educational attainment of the household head and the level of IHD operates through the type of employment and income earning opportunities that are associated with higher levels of schooling.

17.1.8 Number of Economically Active Persons in the Household

The more income-earning members in a household, the greater the household income would be. This is of course assuming that, at least a proportion of the income earned by each member will, in one way or the other, be contributed towards the improvement of living conditions of the household members. Our analysis found that the number of economically active persons in a household

is positively related to the level of IHD whenever there is a statistically significant relationship.

Irrespective of the age of household head or the level of IHD, there exists a positive relationship between the level of IHD and the number of economically active members in a household. The relationship is especially strong and statistically significant when there are three or more economically active members in the household as opposed to one. For instance, a household headed by a younger person is over three times more likely to have a high IHD ($p < .05$) if there are three or more active members in the household as opposed to just one. Similarly, a household headed by a person in the age group 30 to 49 is twice more likely ($p < .05$) to have a high IHD as opposed to low if there are three or more active members in the household as opposed to just one and for a household headed by a person 50 years or older, the likelihood of having a high IHD as opposed to low IHD is 2.64 times greater ($p < .05$). Similar findings were made by Musgrove (1980) for Latin America.

While a household with no economically active member is less likely to have a high IHD than those with one economically active member, the reverse seems to hold true for households headed by persons 30 to 49 years of age⁶⁴. The likelihood of a household headed by a person 30 to 49 years of age to have a high IHD as opposed to low IHD is 34 percent greater ($p < .05$) if it does not have an economically active member, as opposed to one. A possible explanation for this unexpected relationship is the support of an absentee spouse or another member of the family for household consumption.

17.2 The Urban Context

Unlike for the rural sample, the analysis of the relationships between socioeconomic characteristics and the household level of development (IHD) for the urban area does not permit controlling for the three broad age groups due to the relatively small numbers of households involved. Therefore, the urban model

⁶⁴ This is the age group (life-cycle stage) where the economic burden of childcare is likely to be the greatest; young school age children not yet economically active.

is restricted to two broad age groups – those under 30 years of age, and those aged 30 and over.

The urban model also does not allow for the use of macro-level socio economic indicators used in the rural model, as the urban population resides only on the capital island Male' and there is no distinction between different parts of the island in terms of accessibility to the various socio-economic services and facilities. This leaves us with only the household level variables, most of which are related to the head of the household. Table 17-5 and Table 17-2 provide the results of the regression analysis of the relationship between various socio-economic and demographic characteristics of the households and their levels of development, as indicated by the IHD, among the urban households of the Maldives.

Table 17-5: Determinants of Household Level of Development – High vs Low (base level) IHD, Urban Maldives. Estimates From Multinomial Logistic Models

Variable name	Age of household head < 30		Age of household head 30 +	
	(n = 285)		(n = 1201)	
	Wald statistic	Odds ratio	Wald statistic	Odds ratio
Intercept	1.86	-	15.71**	-
Number of persons under 15 in household	6.05**	1.34	10.04**	1.21
Type of household				
Extended	-	1.00	-	1.00
Nuclear	0.27	0.81	4.07**	0.62
Sex of head				
Female	-	1.00	-	1.00
Male	0.49	0.75	0.03	1.04
Migration status of head				
Non-migrant	-	1.00	-	1.00
Migrant	7.79**	0.33	9.15**	0.49
Educational attainment of head				
No grade	-	1.00	-	1.00
Primary	0.20	1.25	1.71	1.45
Middle	1.18	1.73	2.25	1.80
Secondary plus	6.24**	4.87	8.35**	3.08
Active members				
One	-	1.00	-	1.00
None	4.74**	0.34	2.84*	0.52
Two	1.30	1.74	1.32	1.38
Three or more	3.12**	3.49	24.97**	5.28

* p < .10; ** < .05

Table 17-6: Determinants of Household Level of Development – Medium vs Low (base level) IHD, Urban Maldives. Estimates From Multinomial Logistic Models

Variable name	Age of household head < 30		Age of household head 30 +	
	(n = 285)		(n = 1201)	
	Wald statistic	Odds ratio	Wald statistic	Odds ratio
Intercept	0.23	-	4.89**	-
Number of persons under 15 in household	2.48	1.27	11.98**	1.34
Type of household				
Extended	-	1.00	-	1.00
Nuclear	0.90	1.65	0.15	1.15
Sex of head				
Female	-	1.00	-	1.00
Male	0.10	0.84	0.70	0.75
Migration status of head				
Non-migrant	-	1.00	-	1.00
Migrant	2.64*	0.44	0.22	0.85
Educational attainment of head				
No grade	-	1.00	-	1.00
Primary	0.08	0.82	0.25	1.22
Middle	0.20	1.33	0.08	1.17
Secondary plus	2.08	3.07	0.39	0.64
Active members				
One	-	1.00	-	1.00
None	3.35*	0.28	0.23	0.77
Two	0.32	0.69	0.87	0.66
Three or more	0.18	1.46	3.22**	2.24

* p < .10; ** < .05

As shown in Table 17-5 and Table 17-2, the relationship between the different socio-economic and demographic variables and household levels of development in the urban area follow similar patterns as in the rural areas. Even in the urban area, while there is a positive association between educational attainment of the household head and the level of IHD, it is strongest and statistically significant at the highest levels of attainment. The urban results also suggest that the positive association between the number of economically active members in the household and the level of IHD becomes especially strong when there are three or more active members in a household. For instance, among households headed by persons under age 30, the

likelihood of the household having a high IHD as opposed to a low IHD is almost 3.5 times greater when three or more active members are present in the household as opposed to one. For households headed by persons 30 years of over the corresponding odds ratio is 5.28 ($p < .05$). While this association is expected, the strength of relation in the urban area probably reflects the large household sizes in the urban area and the role of the multiple incomes offered by the extended household system in sustaining the high urban costs of living. This partly explains the relative disadvantage of migrant families living in the urban areas in terms of the level of IHD. Migrant families are 66 percent less likely ($p < .05$) than non-migrant families to have a high IHD as opposed to low IHD if the age of the household head is less than 30 years and 51 percent less likely if the age of the household head is 30 years or more ($p < .05$).

17.3 Discussion

The above analysis provides an in-depth look into the relationships between various socio-economic and demographic factors and the levels of development at the micro-level in the Maldives. Several interesting findings emerge from this household level analysis of census data.

It becomes clear that the development of the tourism sector has been beneficial not only for the economic development at the macro-level, but also for improved standards of living at the individual household level, throughout the country. Participation in the tourism sector employment was found to be the most effective means of improving a family's income earning capacity and thus the ability to save and invest.

The positive relationship found between the number of economically active members in the household and the level of IHD suggests that, although the levels of unemployment may be low in the Maldives (see Chapter 10) the actual individual income levels may not be sufficient enough to achieve higher levels of living at the household level. The more economically active members in a household, the better off it is.

The finding of a positive relationship between the number of dependent age members of the household and the level of household development in both the rural and the urban areas is hard to explain. However, a possible explanation is that the number of dependent age members in a household is an indicator of the number of adult members in a household.

The strong positive relationship found between the educational attainment of the household head, especially at the higher levels of schooling, and the level of IHD, both in the urban and the rural areas, suggest the important link between human capital and development at the micro (household) level in the present context. Development literature on the East Asian experiences provide evidence of the link between human capital investments for development, both at the micro, as well as, the macro-levels (Ogawa, Jones and Williamson, 1993; Rowen, 1998; Stevenson, 1998).

The present analysis also found that sex of the individual is not an important factor of the household level of development, either in the urban or the rural areas. Although almost equal numbers of households are reported to be headed by males and females (table not shown), in many of the cases family income is likely to be provided by a male member of the household working away from the home island, either in the urban area or on foreign shipping lines. Remittances sent by men working in the urban centred economic activities and even on foreign ships contribute significantly to the household incomes in the rural islands of the Maldives (see chapter 7). Similar trends have been observed in the small island countries of the Pacific (Hayes, 1993; Simmons *et al.*, 1977; Fairbairn, 1992).

The pattern of absentee spouse is not only a rural phenomenon, as suspected, but is also found among urban households. This is probably due to the fact that, although most of the economic activities are located in the urban area, the nature of the tourism industry requires those employed in the tourism sector employment to be away from their families for considerable periods of time.

In the rural areas, lifetime migrants reflect those circular movements of the rural born in search of education or employment in the urban area or the tourism zone. In the urban area, on the other hand, lifetime migrants reflect those who have migrated from the rural islands to the urban area. Thus the higher likelihood for a rural household to have a high IHD when the household head is a migrant and the lower likelihood for an urban household to have a high IHD when the household head is a migrant are as expected (Standing, 1978; Simmons *et al.*, 1977; Oberai, 1993, citing Mitra, 1987; Bryant, 1993).

Chapter 18: Micro-level Synthesis

The four preceding chapters provide a micro-level analysis of the interlinkages between various socio-economic and demographic factors with population growth, human capital and development in the Maldives. Most of the findings are supported by the existing international literature. This chapter provides a synthesis of the various findings from these independent inquiries in order to understand the salient features of the interlinkages provided by the different models.

One of the most significant factors influencing the households in the rural as well as the urban Maldives is the lucrative tourism industry that is flourishing in the Maldives. It would seem that the tourist resorts, being ‘tourist enclaves’ (Domroes, 1993) located in uninhabited islands physically removed from the local populations, would be of minimal economic benefit for the households in the rural areas of the country. The present analysis shows evidence to the contrary. In fact, households in the rural islands appear to have directly benefited from the tourism sector employment by improving their ability to save and invest in the improvement of their living conditions significantly. However, the flow of these benefits from the urban centred economic growth areas to the rural households has not been straightforward. Rural islanders have to go through considerable hardships, through circular migration and periods of absence from their homes, in order to achieve this. Underlying the societal factors, such difficulties in accessing the modern sector employment may be an important reason for the low levels of female labour force participation in the modern sectors of the economy in the Maldives.

While the island households have benefited from tourism sector employment, these benefits are not uniformly distributed across the widely dispersed islands of the Maldives. In fact, the islands that are closest to the tourism zone and the urban centre appear to have benefited the most from the macro-level economic developments. This probably indicates that apart from the direct benefits of employment in the tourist resorts, other benefits, such as the ready markets for

fishermen of these islands and also the ability of island dwellers to get easy access to the construction, maintenance and other small contract work in these resorts provide them with advantages over the islands that are far away from the resorts.

Socio-cultural factors hinder the equitable participation of women in the tourism sector employment. The same factors also appear to discourage women from being in the labour force as household levels of income increase. Similar to women, older males are also likely to be out of the labour force when household incomes from the younger male members of the household reach levels high enough to provide them with the necessary support. Whenever there is higher labour force participation of men, the participation of women seems to decline both in the rural as well as the urban areas.

As the marital status of employed women suggest, it is only when the support of a spouse is no longer available that women are more likely to become economically active. Women who fall into this category are also likely to be those at the lowest economic stratum, often employed in menial jobs. The nature of women's economic activity in the rural Maldives is also seen in the relatively high levels of participation in islands where the dominant activity is agriculture.

A household's economic well being is associated with male labour force participation, while the labour force participation of female household heads is associated with low levels of household development. These findings also support the above mentioned – that female household heads are less likely to be in the labour force when the income of either the spouse or the other members of the family are able to provide adequately for the needs of the household members.

Labour force participation of adult members of the household, such as the household head, have several positive influences on the well being of household members, through increased human capital development and labour force participation children of household head. In addition to these effects, the

increased labour force participation of women is also negatively linked to their fertility.

The household type – nuclear family or extended family – plays an important role in the social support network in the Maldives. Overall, female household heads are more likely to be economically active in extended family households and male household heads are more likely to be economically active in nuclear family households. The social support network of the extended family households seems to require the head of household and spouse to be economically active in order to provide the support for its members. Separated from the extended family system, male household heads of nuclear family households lose the support from the extended family and are therefore, required to become actively engaged in gainful employment. Perhaps, due to the ability of the nuclear households to invest more of the family income on the welfare of the family, or perhaps due to the need for childcare, adult females of nuclear family households are more likely to remain out of the labour force than adult females of extended family households.

The extended family setting also makes children less likely to be schooling at the higher grade-levels than children in nuclear family households. With the opportunities for alternative childcare providers likely to be greater in extended households, one would expect women in extended households to have higher fertility due to lower opportunity cost of childcare. However, there appears to be other factors that are important in the fertility decision-making of couples in the Maldives.

Since nuclear families that live within extended family households mostly do so, not by choice but due to the circumstances, their fertility is likely to be more restricted than if they were in a nuclear family household. The most important reason is perhaps the scarcity of housing land in many of the densely populated islands, including the urban area. This means that the physical limitations of space play a major role in limiting fertility within the extended family households. Moreover, since nuclear family households are likely to be families with children that have moved out of extended family households,

females in nuclear family households are more likely to have larger families than females in extended family households.

Dependency levels in the household has a negative influence on the schooling of children in the urban households due to the high private costs involved with schooling of children in the urban area such as high costs of tuition and other extra curricular activities. It is not only the higher private costs of schooling that causes a negative relationship between young dependency levels and schooling in the urban area, but also the availability of ample opportunities for employment, coupled with the fact that some children in the age group considered here, would have already completed the lower secondary levels.

At the level of the households, young dependency levels in the household affect the male and female household heads differently. The responsibility of childcare being on females, their chances of labour force participation decline as the young dependency levels increase, while the chances of male household heads to be economically active increase with more dependent age children in the household, as the responsibility of providing the household income rests on males. The positive relationship observed between the dependency levels in a household and the level of household development, and also between the number of economically active members in a household and the levels of household development, suggests the importance of multiple earners per household for improved household levels of living.

Household factors such as the demographic composition of its members influence the behaviour of individual members. For instance, the schooling of older children is likely to be disrupted when younger members are present in the household, while the presence of older children in the household is likely to be a positive factor for the schooling of younger children. It is likely that in families where there are many children in the school-going ages, the labour force participation of older children and their contribution to household income are important in seeing that all children get educated. To this extent, there may be an expectation of the parents that the older children will provide for the schooling of younger children and also for the support of the parents in old age.

Educational attainment was found to be perhaps the most common factor in almost all constituents of the fertility, human capital and development nexus. Educational attainment of the household head has an important positive influence on the household levels of development in the rural and the urban areas. The lack of statistical significance at the lower levels of schooling in the urban area may be explained by the influence of a large and productive informal sector in the urban area and the employment of the educated workforce in the lower paid public sector. However, a relatively strong relationship at the highest levels of schooling suggests that the education – employment relationship is becoming stronger in the urban area.

Educational attainment of head is also an important factor in the schooling of children. More educated household heads are more likely to encourage their children to continue schooling at the secondary and higher secondary school ages.

Educated women are more likely to favour smaller families by limiting their fertility, both in the rural as well as the urban areas. Education encourages delayed marriage and hence, the delaying of the first birth and probably the preference for smaller completed family size. Age at first marriage appears to be an important variable in determining the lifetime fertility of women in the Maldives. In the absence of widespread use of deliberate fertility control measures, this is an important finding since most of the childbearing among Maldivian women occurs under the age of 30.

The socio-economic development patterns in the Maldives entail internal migration an essential pre-requisite for economic development at the level of the household in the rural areas. Thus, it is not surprising that rural to urban circular migration and remittances appear to play an important role in determining the household levels of development in the Maldives. Migration does not always lead to high levels of household development. In fact, unlike the circular migration of household head from the rural area to the urban area and the tourism zone, when the entire household or a family moves to the

urban area the chances are that the high cost of urban living has a negative effect on their levels of living.

In both the rural and the urban areas, migrants are more likely to be in the labour force than non-migrants. However, migrant female household heads in the urban area are less likely to be economically active than female heads of non-migrant households in the urban area. This is probably because migrant females in the urban area are likely to be less educated than the urban born female household heads, making them less competitive in the urban employment market

In addition to providing access to modern sector employment, rural to urban migration also plays an important role in the access to better quality education for rural children. Many rural families migrate to the urban area in order to send their children to urban schools. This is crucial for human capital development, as household level of development is an important factor in the schooling of children at higher levels of schooling.

Migrant children are more likely to be schooling at the secondary and higher secondary level ages than the urban born of similar ages. This is probably due to the fact that the primary objective of migration for the rural to urban migrant children is likely to attend secondary and higher secondary level schools in the urban area. This makes the overall likelihood of schooling of migrant children higher than the overall likelihood schooling of urban born children in this age group. This effect is further enhanced by the likelihood of higher age for grade of migrant children in urban schools.

Female migrants of the reproductive ages are more likely to have smaller completed family sizes than non-migrant females, both in the rural and the urban areas. In the rural areas this is explained by the effect of the urban exposure of women. The observation of the likelihood of lower fertility for migrant women in the urban area may be explained by the selectivity and the disruption hypotheses (chapter 14). With migrant women likely to have small family preferences even before they move, as a group, they are more likely to

take full advantage of the family planning opportunities available in the urban area, thus making them more likely to have lower fertility than the average urban born woman. Similarly, the process of moving from the rural area to the urban area may also have had a disruptive effect on their fertility behaviour.

The above synthesis shows that the micro-level linkages between fertility, education and household levels of development are complex. While fertility is influenced by an individual's level of education, labour force participation and other household and socio-economic factors such as migration, household composition, levels of household dependency influence the education and labour force participation of household members in different ways. An individual's education is influenced by household level factors such as education, labour force participation of household head, household composition and the level of household development. Household levels of development are associated with population and human capital characteristics of the household head as well as the household itself.

As we have discussed earlier in this thesis that the extensive use of census data and the complex variables developed by the author from census data, particularly in the multivariate analysis, poses some limitations to the findings discussed above. However, the fact that these findings are supported by our qualitative data and that our findings conform to the evidence from existing international literature provides credence to the present findings.

PART D: SYNTHESIS AND CONCLUSION

Chapter 19: Synthesis, Macro/Micro Integration and Conclusion

The analytical results presented in the Part B consists of macro-level trends and differentials in population, human capital and development factors and in Part C this is reinforced by an analyses of the interlinkages between these factors at the micro-level in the Maldives. Chapters 12 and 18 have already presented the syntheses of the findings of these two parts separately, whereas the purpose of this chapter is to attempt to bring these two aspects together with the objective of providing the reader with a perspective of how the relationships between population growth, human capital and development interact in a micro/macro framework in this particular context.

19.1 Macro/Micro Interlinkages in Fertility, Economic Development and Human Capital

After a significant period of declining mortality, the fertility levels in most parts of the Maldives started declining between 1985 and 1995. At the macro-level, at least three factors appear to have been responsible. Firstly, the indirect effects of the health programmes aimed at improving the health and survival of women and children through the MCH (maternal and child health) and child-spacing programmes appear to have played a role. Secondly, the age at first marriage has increased during this period. Of special significance for the reduction of fertility is the increase in the age at first marriage of women. The third factor, which is a more subtle factor may be the physical limitations of space experienced in the more densely populated islands of the country, particularly the capital Male'. More appropriately, the physical limitation of space means shortage of housing for individual families that force them to live in confined spaces, mostly within extended family systems, leading to family size control.

These demographic trends have affected the current age structure of the population, with serious implications for the socio-economic development

aspirations of the nation, at present and in the future. Most significant effect at present is the congestion of the school system. This is further exacerbated by the continuous struggle to keep up with the goals of primary education for all its citizens. At the same time, considerable amounts need to be invested for the enhancement of the skill levels of the emerging workforce in order to cater to the demands of the growing economy. The future implications, apart from those just mentioned, would also result from the distortions in the age structure having wave like impacts on the social and economic infrastructure of the country. While these changes are apparent at the macro-level, the micro-level interactions provide clarity to the factors that involved in these relationships.

While socio-cultural factors discourage women from working away from their home communities, in the absence of opportunities for schooling for older girls, early marriage was encouraged in order to reduce the dependency burden of families from their 'grown up' children, especially girls. However, with the availability of increasingly higher levels of schooling in the rural areas at present, most girls, even in the rural areas, are at present continuing to school until they are well past their 15th birthday, thus having a significant impact on the overall levels of fertility in the Maldives.

Even among those who are already married, educated women are also more likely to have lower fertility. Since age at first marriage is negatively associated with a woman's completed fertility, the effects of education and delayed marriage is likely to reduce the levels of fertility still further. In fact, education appears to be the key factor in fertility decline throughout the macro and micro-level analyses presented in this thesis. Labour force participation of women appears to be negatively associated with fertility. Since educational attainment has been found to be an important positive factor in the labour force participation, it appears that education of women would affect their fertility not only directly through increased awareness, but also indirectly through their labour force participation and the increasing opportunity cost of childbearing.

Since women in the Maldives do not migrate to the same degree as males in search of employment, the migrant status of rural women would indicate their

schooling in the urban area, or their urban exposure while providing education to their children. This is probably the reason that migrant women were found to be more likely to have lower fertility than non-migrant women in the rural areas. Alternatively, lower fertility among migrant women in the urban area could indicate the effect of disruption on fertility due to the temporary separation and housing problems that are usually involved in the process of migration.

Fuelled by the tourism sector growth and the advances made in the fisheries sector, the economy of Maldives has grown rapidly during the past two to three decades. The commonly used macro-level indicator of economic growth, the GDP, has almost quadrupled between 1981 and 1996 (see Chapter 11). This rapid growth was assisted by rural to urban migration of workers, and also due to the modernisation and diversification of the largely rural based fishing industry. Modernisation of the fishing industry did, however, have a negative effect on the labour force participation of rural women. Changes in the methods of fish processing and export made women's input to fish processing largely obsolete, thus relegating them to the not economically active population.

It is not only the changes in the fishing industry that has worked against female employment in the recent decades. Increasing levels of household incomes have also had a negative impact on women by excluding them from the labour force. Social factors, such as the influence of husbands over their wives discourage women from economic activity when the levels of household income increase. Thus, as the benefits of macro economic development reach the level of the households, the existing social forces act against the full participation of women in economic development. However, the relationships between women's education and labour force participation and women's education and fertility suggest that this system is likely to weaken as women become more educated and, as family sizes become smaller.

As a result of the pattern of economic development and socio-cultural factors discouraging women from certain types of occupations, many Maldivian

women have been relegated to the not economically active population. At the same time the numbers of expatriates employed in the country increased almost uncontrollably. Demand for new skills initiated by the growth of the tourism industry, increasing income levels, changing attitudes of Maldivians towards certain types of unskilled work, and the introduction of new labour intensive industries such as garments processing plants have contributed to the growth of the expatriated labour force in the Maldives.

In spite of the large expatriate labour force in the tourism sector, the growth of tourism in the country can be said to have been extremely beneficial for the household level development in both the rural and the urban areas. These benefits are derived both, directly and indirectly. Direct benefits from the tourism sector growth to the households in the islands flow through the availability of salaried employment in the tourist resorts and other tourist accommodation, and affiliated activities such as transport, contract work in the construction and maintenance, and in the supply of fresh fish to the resorts. The indirect benefits of tourism are derived through employment opportunities in the supporting sectors such as trade, transport and supply of goods and services, and by the availability of consumer goods at reasonable prices to the local consumers. Among all these, the most empirically evident benefit comes from the increased household levels of living associated with employment in the tourism sector, or by being located in close proximity to the tourism sector.

These benefits, however, have not been equitable. Those islands closest to the modern sector developments (tourism zone and the urban area) have benefited most. There are exceptions to this trend; some islands in the most distant atolls have fared better in terms of labour force participation of males and levels of household development than those located in the less distant atolls. This indicates that the levels of human capital are more important than the geographical isolation for gaining access to modern sector employment and better household levels of development in the rural islands of the Maldives.

Household heads with some education are more likely to be able to benefit from the employment opportunities availed through the economic growth since

educated household heads are more likely to be employed than those without any education. Education of the household head is not only important for their own employment, but it is also an important factor in determining whether their children will be educated, and ultimately employed. However, the rural-urban disparities in macro economic growth would mean that those living in the rural areas will, in most cases, have to continue to migrate to the urban area or the tourism zone, in order to utilise their skills in the modern economic sectors. On the other hand, it is through the employment of these migrants that the existing labour force demands will be catered for by the indigenous workforce.

Growth of employment opportunities in the tourism sector has, so far, not been directly beneficial for Maldivian women. The 'enclave' nature of the Maldivian tourism industry and the protective attitudes of parents towards their daughters prevent young females from participating in tourist resort employment. The only form of economic activity that females appear to play a dominant role seems to be agriculture. Agriculture being a relatively insignificant and primitive sector of the Maldivian economy, this suggests that those women involved in agriculture are also likely to be at the lowest stratum of the socio-economic structure.

The role of females as the homemaker of the family also puts them at a disadvantage in terms of employment. When the number of dependent members in a household increases, it is more likely for female household heads to be out of the labour force. The link between macro-level economic development and the levels of development of the households is more commonly through the male members of the household.

Migration is not only an important factor in finding suitable employment. Although most of the rural islands now have access to secondary levels of schooling, and the quality of instruction and facilities may vary greatly between different islands, what is more significant is that there are disparities in the resources and the levels of education available between the urban schools and the rural schools. The ability of parents to send their children to

urban schools is therefore important in the quality of human capital they would acquire. Even in this uneven distribution of educational facilities, different children within the households appear to have different levels of accessibility. In other words, depending on the number of children in the household, the chances of a child to be schooling is different for the older children and the younger children. The present analysis suggests that the older children are at a disadvantage.

In spite of the economic developments at the macro-level and the improvements of the household levels of living in the rural and the urban areas, an area that is vastly lacking in progress is the nutritional adequacy of children and mothers, especially in the rural areas of the Maldives. Proper levels of nutrition are believed to be crucial for the maintenance of good health and ultimately for the quality of human capital (Jones, 1993; Berg, 1973). Although it has not been possible to include the nutritional aspect of human capital in our micro-level analysis, the available evidence from existing published data and the qualitative data collected by the author suggest that the problem of under-nutrition in the Maldives is caused by the dietary *habits* of the Maldivians and not so much due to poverty, although the effect of poverty in some pockets of the population cannot be altogether ruled out (Ministry of Planning and National Development and the United Nations Development Programme, 1999:61-66).

19.2 Implications for Development

The macro/micro interlinkages of fertility, economic development and human capital discussed in the preceding section are likely to have their direct and indirect implications for the society, economy, and the natural environment. While recognising that due to the complexities of these interlinkages, their implications would be difficult to point out, attempt is made in this section to identify the major implications for the purpose of further research, and to propose some policy directions that may be adopted for a more equitable and sustainable socio-economic development in this particular context.

19.2.1 Social Implications

The changing population dynamics has created an age structure that is at present imposing heavy strains on the socio-economic infrastructure of the country. These changes are not only of immediate concern but would also have inevitable implications for the future socio-economic development programmes of the country.

In the future, while the demand for social services would remain high, large pools of the working age populations will emerge. If adequately resourced these populations will be smoothly absorbed into the labour force, replacing the skilled sections of the expatriate labour force. However, the failure to devise strategies to adequately train them could lead to severe social problems and possibly an increase in the expatriate dominance of the vital sectors of the economy.

With the changing age structure, new issues such as youth unemployment and the issue of aging are emerging. Of these the issue of youth unemployment is more crucial, at least for the present. This proportion is likely to increase since the large numbers of secondary school graduates with low vocational skills and high aspirations for employment may create a mismatch between the labour market demands and labour force supply, leading to social problems such as crime and drug abuse. Drug abuse is already a major problem, especially among youth, in the Maldives and has the potential to be a major impediment to social development in the country.

Increasing numbers of older persons in the population would mean substantial investments in and demand for geriatric services in the future. While the life expectancy increases, the past and present dietary habits of the Maldivians suggests that health care costs of the elderly is likely to bear heavily on the society.

With the recent declines in the levels of fertility, the current pressures of the schooling infrastructure is likely to be slightly relieved in about a decade or so when the numbers of school age children is likely to start dropping. However,

the population momentum created by the large numbers of surviving births from the high fertility regime will continue to affect the population age structure as the large numbers of surviving births reach the childbearing ages. Similarly, the current large proportions of school age population will not only impose heavy strains on the labour market as they approach their adult ages in the near future, but also on housing and other infrastructure. If current patterns of congested living in extended family households are left unattended, the compounding effect to the demand for additional housing will not only cause public health problems, but also the ambitious goals of the government in producing a well resourced stock of human capital to replace the existing expatriate labour force is likely to be disrupted since extended family households have been found to have a negative effect on the schooling and labour force participation of individuals.

As the current trends suggest, the labour force participation of females is likely to increase significantly, even extending into areas such as tourism and trade sectors, that are, at present restricted for females. This would have implications for the fertility levels in the future. However, innovative approaches will be needed to provide childcare if women are to continue to be involved in employment in the modern sectors even after having children. Women's involvement in employment outside the home island is likely to have significant effects on the existing socio-cultural fabric of the island communities. It is likely to bring about considerable improvements in the status of women in the society and within the family although such change is not likely to be rapid⁶⁵.

This said, women are not likely to travel in search of employment the way that men do in the Maldives, at least in the foreseeable future. Participation in the tourism sector employment is likely to remain restricted to the extent that women living in islands closest to the tourist resorts have the greatest chance of employment in the tourism industry.

65 The government has recently appointed the first female island chief in the country

19.2.2 Economic Implications

It is clear that the Maldivian economy has grown rapidly within the past three decades. The leading sector behind the remarkable growth has been the tourism sector. The isolated nature of the tourist resorts, and the high proportions of expatriates employed in these resorts raises the question whether the tourism industry growth has occurred in isolation from the rest of the economy and if the per capita GDP is a true reflection of the standards of living of the average Maldivian. The answer lies in the positive relationships found in the present thesis between the levels of household development and the different indicators of the affects of the tourism industry. However, an important finding is that not all rural islands of the Maldives share these benefits equally. In general, the islands that are closest to the tourist resorts have better chances of deriving these benefits than those that are far away from them. These disparities are likely to diminish when modern sector employment opportunities such as the new tourism zones are opened in more distant atolls and the proportion of the country's population with the accessibility to resort employment and other modern sector income earning opportunities increase.

Fisheries industry, which has remained the largest employer in the rural areas has remained to be of great significance for the improved income levels of the island households in the Maldives, through the transformation and development that occurred in the fishing fleet and the methods of processing and marketing of the fish catch. The incomes of fishing families have improved significantly through these changes and with the diversification of the types of fish caught and markets. Of little economic benefit for the fishing families is perhaps the growth in the issuing of licenses for foreign fishing vessels to fish in the EEZ of the Maldives.

As the tourism industry grows and the fisheries industry diversifies and modernises, the issue of human capital development is becoming more important. If the increasing numbers of secondary school graduates and the working age population are suitably trained to take over the jobs currently filled by expatriate workers in the tourism industry and new opportunities in

the fisheries industry, it would not only spread the benefits of the tourism industry earnings to the households across the country but it would also dramatically increase the tourism sector earnings retained in the country that can be invested for the socio-economic development of the country. In this respect, internal migration would continue to be the chief means of transferring the tourism sector earnings to the households in the rural areas.

The growth of tourism and the continuing domination of this sector in the Maldivian economy pose several issues of vulnerability. The tourism industry being totally dependent on the economic situations in the distant markets remain highly volatile to the global economic situation, as was seen during the gulf war of the early 90s, when tourist arrivals declined sharply. More recently, the Asian Crisis has also had such ripple effects on the Maldivian economy. Especially crucial is the fact that the major factor related to household levels of development in the Maldives is a household's ability to participate in tourism sector employment or in any of the related sectors. A deterioration or disruption of the economic situation in any of the major tourism markets would have drastic consequences on the Maldivian economy.

The second most important sector of the Maldivian economy, fisheries, also remains highly vulnerable to external market fluctuations. Fluctuations in the price of fish in the world market has direct impact on the families as any changes in the price of fish in the international market are normally adjusted internally by changing the price paid by local buyers to the fishermen. Thus, irrespective of the links with either population or the levels of human capital, the economy of Maldives remains extremely vulnerable to exogenous factors.

It has been mentioned earlier in this thesis that the environmental aspect of population and development is beyond the scope of this thesis. However, it is imperative to point out here that the environmental implications of the growth and spatial distribution of the population, and economic development are crucial for the mere sustainability of the present levels of development, particularly in the present context. Some of these environmental problems are already proving extremely costly to rectify. Among these problems the

depletion of the freshwater aquifer and its contamination from solid and human waste, deforestation, housing congestion, and the disruption of the protective reef due to the reclamation of the surrounding lagoon for additional land. In addition to these, in islands such as the capital Male' and some of the industrial islands, hazardous wastes from various industrial establishments and the main sewer are pumped out untreated into the sea. These are likely to have long-term implications for the health of the nearby reefs and other marine life surrounding them. Any negative effect to the marine environment of the atolls of the Maldives would have disastrous consequences, not only for the physical existence of the islands, but also for the vulnerable economy, which is totally dependent on its well being and more importantly the food security of the Maldivian people.

19.3 Summary and Conclusions

The present thesis shows that changing population dynamics – declining mortality and more recently, declining trends in the levels of fertility – have brought about rapid declines in the rate of population growth in the Maldives during the decade of 1985 to 1995. Preliminary estimates of the Census 2000 of the Maldives provide further support to the evidence of fertility decline presented in this thesis (Ministry of Planning and National development, 2000).

The preliminary estimates of the Census 2000 suggest that the medium variant projections presented in this thesis may be slightly higher and, therefore, probably the low variant projections may be closer to the actual population in the future. The impact of these changes would mean that the pressures on the human capital investments might be slightly lower than the ones presented in Chapter 10 of this thesis. At the same time, this would also mean that proportionately, the aging population might be slightly higher than the estimates presented. However, even with these slight changes, the implications for the social and economic development of the country, presented in this thesis are likely to remain highly relevant.

The present investigations suggest that factors such as delayed age at first marriage and conscious measures to space and limit fertility were important in the fertility decline in the present context. However, these factors are influenced by socio-economic factors such as increasing educational opportunities, housing congestion, and the influence of the household members and the community.

The present study shows that there has been an undeniable growth in the overall levels of economic development in the Maldives during the past three decades. While the households in the rural islands of the Maldives have been able to participate in this growth, there are some disparities in the distribution of the growth between the various island communities of the country. These disparities are caused largely due to differences in the accessibility of the people of these islands to the growth centres and also due to the differences in the kinds of skills possessed by the people of different islands.

While the fisheries sector has remained the most important sector in terms of the proportion of the labour force, the tourism sector has grown rapidly to become the leading sector of the economy in terms of the contribution to the GDP. These differentials in the growth of the two important sectors can be attributed to the largely hands free approach of the government towards the tourism sector and the protective attitude of the government towards the fisheries sector. However, recent policy changes suggest that the government is gradually loosening its control over the fisheries sector.

A growth in expatriate employment has been necessitated by the rapid economic growth that occurred largely as a result of the growth of the tourism industry, and the growth in the demand for social services due to the growing numbers of the young population, both requiring some type of skill that are in severe shortage among the indigenous workforce. Semi-skilled and low paid factory workers in the garments processing factories and the fish canning plant has also contributed to the growth in expatriate employment. While the fish canning plant is of significant benefit for the local families, through the employment opportunities it provides and through the ability for the fisherman

to sell their fish for ready cash, the garment industry remains of marginal benefit.

The increased levels of household income that resulted due to the macro-economic developments in the country have excluded large numbers of women from the labour force. The main economic activity those women used to be involved being fish processing at home, these changes can be seen as positive. However, the present investigations suggest that there is a tendency for women to be excluded from the economic activities when the income of the household increases. The types of employment opportunities available in the rural areas, the restriction for women to travel away from the home island for work, and the lack of alternative child care arrangements are likely to be the factors behind this trend.

Internal migration has been an important feature of the socio-economic development at the national level and also for the households at the level of the islands. Those who are able to migrate in search of employment and education are at an advantage in terms of human capital development and labour force participation. At the level of the household the advantage is for younger children when there are more children in the school going age groups.

Although the quantitative data used for the analysis of the micro-level interlinkages do not provide information on nutritional levels, the published data and the qualitative information collected by the author point to significant deficiencies in the diet of Maldivian families. The qualitative inquiries also suggest that these deficiencies may be attributed to dietary habits rather than circumstance.

The nature of data used for the present analysis does not permit an extensive study of the intricate interlinkages between population, human capital and economic development with adequate consideration of factors such as the educational quality and nutritional and health factors of human capital. Furthermore, this is too broad an area to conduct such an analysis within the limitations of time and space available for a doctoral dissertation. The

relationships between population, human capital and economic development that become evident from the present research however provide interesting insights on this subject as relating to the specific situation of the Maldives.

To the knowledge of the present author, this is an area of research that has never been attempted at a level such as this thesis presents on the particular case in question – the case of the Maldives. Many of these findings would therefore provide invaluable leads on critical aspects of the nature of economic development in the Maldives as relating to how it affects the human capital formation and supply, at present and in the future. Of particular significance for policy would be the evidence of the relationships between household factors and the education and labour supply of children and also the labour supply of women. How these factors are addressed in the immediate future would determine the success of the country's socio-economic development aspirations. Clearly, the development of an efficient stock of human capital in terms of its quality, quantity, and motivation to participate in the labour force, will be the most important determinants of the sustainability of the current levels of socio-economic development in the Maldives.

19.4 Policy Implications

The current trends of fertility suggest that it has started to decline steadily during the period 1985 to 1995. However, during this period, some regions of the country experienced actual increases in fertility. The adoption by the Government of an explicit policy of population control through education, awareness, and loosening up of its control on the distribution of contraception by making it available through pharmacies has probably been an important factor in fertility decline. In the atolls that experienced fertility increase during the period 1985 to 1995 it is likely that only some islands within these atolls may cause these differences. Even in the atolls that experienced fertility decline there may be some islands of high fertility. This raises questions about the equitable access to education, awareness and availability of contraception across the different islands of the country, thus calling for the need for selective intervention. Islands of high fertility need to be identified and the causes

understood in specific fertility awareness programmes are to be conducted for such islands.

Concurrent to fertility reduction programmes, it would also be important to pursue further reductions in the levels of infant and childhood mortality and maternal mortality also emphasising on further reductions in the levels of neo-natal mortality, especially the early neo-natal mortality rates. This, of course, would need improvements in the antenatal care and information, obstetric care, and most importantly, improvements in the dietary habits of the people, especially women during pregnancy and in the neo-natal period when they are breastfeeding. Improving the nutritional levels of the people is equally vital in order to get the maximum benefit from human capital development efforts. In order to address the problems of nutritional inadequacy, a better understanding of the socio-economic and cultural correlates of these factors is needed urgently.

Continuous assessment of the levels of basic competency at particular ages across all regions and the regular monitoring of any differentials would help to rectify problems before they become too big. The present study suggests that there may be household factors that discourage children from continuing higher levels of schooling and participation in the labour force. The extent of this problem and the success in addressing them would have important implications for the socio-economic development aspirations of the country through their effect on the human capital development goals.

Perhaps one of the more compelling findings of the present study is that not only did women become relegated to the not economically active category due to the changes that occurred in the fisheries industry, but also the resulting increases of household incomes meant that socio-cultural forces discouraged women from participation in the labour force. This is probably truer when the types of employment opportunities available in the community required them to either spend long hours away from home or when the community sees that the types of employment available are inferior. The types of employment opportunities offered by the garments factories may therefore not be seen as

appropriate for women's employment in the rural Maldives. It appears that there is a need to re-examine the policy of establishing garments factories in inhabited islands as a means of providing income for rural households.

At the same time, it would seem that there is a need to change the attitudes of parents towards sending unmarried females and of husbands towards sending married females for work away from home. Such attitudinal change would not come easy. As discussed in Chapter 10 of this thesis, critical to the success of increased female labour force participation in areas such as tourism may be the establishment of a system of daily transport back and forth between home and place of work if they are in separate islands.

Similar to the policy adopted for the inclusion of fisheries science in the secondary school curriculum, greater interest and awareness among the new entrants to the labour force on tourism sector employment may be created by a similar approach to tourism education. Further, it appears that there is a need to enhance the drive for employment in general among the younger generations, and the attitude of parents towards their children's employment in the tourism sector.

The present study reveals that the benefits of economic growth have been distributed to a significant extent among the rural households. However, some disparities were also observed in this respect. The current policies of the government to create regional growth centres that would provide easy accessibility for the 'distant' islands to urban services appear to be encouraging. However, the remoteness of some of the islands and the spatial distribution of the population implies that the policy of population consolidation is also equally important. The high costs of transferring entire populations from one island to the other raises the question of the sustainability of the present form of implementing this programme. In order to ensure sustainability, the issue of cost-recovery may need to be looked at carefully.

Since the natural environment is the backbone of the livelihood of the Maldivian people, it appears that there is a need to protect it from those who

deliberately and unconsciously threaten its well being. Although the awareness of global environmental issues may be high among the Maldivians, it seems that they are less so with regard to local environmental issues. Thus, there would seem to be a need to increase the awareness of locals on the local environmental issues.

It seems that the government's human capital development programme requires putting equal if not greater emphasis on the provision of vocational skills to the workforce as academic skills. While academic skills are important for research and development in various fields that are relevant for the socio-economic development in the particular context of the Maldives, the significance of creating interest among students from an early age on vocational skills that are important for the tourism, fisheries, construction, transport, manufacturing and other emerging sectors cannot be stressed.

While economic diversification has featured a priority area in the National Development Plans, it appears that much needs to be done in order to achieve this. The creation of the legal and administrative infrastructure to encourage human capital intensive (as opposed to labour intensive) industries may be hastened and local incentives of such ventures nurtured and nourished.

For the moment, expatriate employment is likely to play a crucial role in filling the human capital gap of the Maldivian workforce if present levels of social and economic development are to be sustained. However, there seems to be a need for careful consideration in implementing policies aimed at curbing the growth of the skilled components of the expatriate workforce, as ad hoc policies could lead to a reduction in the quality of services and output in the vital areas of tourism and human capital development.

19.5 Research Directions

While the data analyses presented in this thesis provide several interesting findings on the relationships between population, human capital and development in the Maldivian context, due to the nature of the data used some of the findings may not provide conclusive evidence. However, they open up

several interesting research questions that need further investigation using more indepth data on the specific aspects. The purpose of this section is to highlight some important research areas that may provide further dimension and depth to the findings of the present thesis.

The indicator of household level of development used in the present thesis needs to be strengthened through the incorporation of additional components measuring the level of affluence at the household level. Additional factors such as the combined household income, both in cash and in kind, that is available for the members of the household, and a breakdown of the household expenditures could be included. In order to have a better understanding of the relationship between the industry of employment and income, individual incomes could be studied in relation to an individual's industry of employment.

The present study suggested some important micro and macro factors affecting the level of educational attainment and labour force participation of individuals, such as the sibling position within the family, type of household, migration status, and household income. Further research is needed to elaborate on these findings.

Our findings also showed that fertility levels have declined in all but seven regions of the Maldives. The regions that experienced fertility increase needs to be examined more closely. In the interim, the new data from Census 2000 would perhaps confirm the permanence of those increases. Further research is also needed on the age-structural implications of the past and present population trends for the future social and economic development programmes of the nation since with a decline in the contribution of birth rate to population growth rate, age-structural influences are likely to become important.

The present study found that the extended family household is less conducive for children's education and also for the fertility of women than nuclear family households. Although empirical support has been provided for these findings, further investigation is needed in order to establish these findings and to find

the socio-economic and cultural factors that are associated with such behaviour in the present context.

As an important factor of the quality of human capital, the nutritional deficiencies among the population of Maldives need urgent attention. Further research is needed to study the socio-economic correlates of the levels of nutrition in the Maldives and their implications on the reproductive health of women and the human capital of children.

Finally, the present study suggests that there might be important household and community factors discouraging women from active participation in the labour force; women were more likely to be economically active when the main economic activity of the island was agriculture, and women were found to be less likely to be economically active if her spouse was active. These findings point to significant disparities in the labour force participation between males and females in the Maldives. Further research is needed to understand the factors that are involved.

The present study has provided significant light on the research questions raised at the beginning of this thesis. Yet, more indepth understanding is needed on the various findings highlighted above in order to adequately address the issues raised. While the present study concerns with the interlinkages between population, human capital and development in the particular context of the Maldives, these findings also add to the existing pool of knowledge on the intricate interlinkages in this complex area of research interest. To this extent, some of the findings from the present study may be of relevance for policy formulation in the context of other small island populations.

APPENDICES

Appendix 1 : 1995 Census Questionnaires

QUESTIONNAIRES OF THE 1995 POPULATION AND HOUSING CENSUS OF MALDIVES (Translated from the Dhivehi language by the author)

HOUSING QUESTIONNAIRE

1. Identification of the housing unit
 - a) Name of the atoll and island
 - b) Census block number
 - c) Name of housing unit
 - d) Serial number of housing unit
 - e) Occupancy status of housing unit
 1. Occupied
 2. Vacant

2. Identification of the household
 - a) Number of households
 - b) Serial number of this household
 - c) Number of questionnaires completed for this household
 - d) Number of persons living in the household (Maldivians + foreigners)
 1. Occupied
 2. Vacant

3. Type of dwelling unit
 1. House
 2. Apartment/flat
 3. Collective living quarter (hostel, hotel etc.)
 4. Institution (hospital, prison etc.)
 5. Vessel (*dhoni*, ship etc.)
 6. Mobile unit
 7. Other (specify)

4. Number of stories
5. Material used for the walls of the housing unit
 1. Coral stones, unplastered
 2. Coral stones, plastered
 3. Cement blocks, unplastered
 4. Cement blocks, plastered
 5. Wood or plywood
 6. Thatch
 7. Concrete
 8. Other (specify)

6. Material used for the roofs of the housing unit

1. Corrugated sheets
 2. Concrete sheets
 3. Thatch
 4. Other (specify)
7. Material used for the floors of the housing unit
1. Tiled
 2. Cement
 3. Sand
 4. Wood
 5. Concrete sheet
 6. Other (specify)
8. Number of rooms
9. Type of lighting used
1. Own electricity
 2. Private electricity from outside source
 3. Public electricity
 4. Kerosene lamp
 5. Other (specify)
10. Type of toilet used
1. *Gifili*
 2. Beach
 3. Multi-household use toilet connected to main sewer
 4. Single household use toilet connected to main sewer
 5. Multi-household use toilet connected to septic tank
 6. Single household use toilet connected to septic tank
11. Number of toilets in the housing unit
12. Age of the dwelling unit
13. Ownership status of housing unit
1. Owner occupied
 2. Rent free
 3. Rented
14. Monthly rent
15. Type of drinking water
1. Rainwater from private tank
 2. Rainwater from outside
 3. Desalinated water obtained free of charge
 4. Desalinated water purchased
 5. Well water from private well
 6. Well water from public well
 7. Ground hole water

8. Bottled water
16. Method of treatment if any
 1. Boiling
 2. Chlorinating
 3. Filtering
 4. Untreated
17. Type of cooking fuel
 1. Firewood
 2. Kerosene
 3. Cooking gas
 4. Electricity
 5. Other (specify)
18. Availability of consumer durables
 1. Radio
 2. TV
 3. Video player
 4. Stereo
 5. Sewing machine
 6. Refrigerator
 7. Washing machine
19. Deaths in the household in the past 12 months by age at death and sex

INDIVIDUAL INFORMATION QUESTIONNAIRE

Those included below should be; i) Maldivians who regularly take meals from this household ii) Maldivians who take meals from different places at different times but sleep regularly in this household iii) Maldivians registered in this household but are known to be overseas at the time of enumeration.

20. Name of person
21. Sex
22. Age in completed years
23. Relationship to head of household
 1. Household head
 2. Spouse of head
 3. Child/stepchild of head
 4. Brother/sister of head
 5. Son/daughter-in-law of head
 6. Mother/father of head
 7. Grandchild of head
 8. Other relative of head
 9. Person unrelated to head
 10. Persons in institutional households
24. Person number of mother for persons under 15 years of age if mother present in household

25. Place of birth
1. This island
 2. Another island of Maldives (name of island and atoll)
 3. Overseas (name of country)
26. Place of registration
1. This island
 2. Another island of Maldives (name of island and atoll)
 3. Overseas (name of country)
27. Place of usual residence
1. This island
 2. Another island of Maldives (name of island and atoll)
 3. Overseas (name of country)

END INTERVIEW FOR CHILDREN UNDER ONE YEAR OF AGE

28. Place resident on 25 March 1994
1. This island
 2. Another island of Maldives (name of island and atoll)
 3. Overseas (name of country)

END INTERVIEW FOR CHILDREN UNDER FIVE YEARS OF AGE

29. Place resident on 25 March 1990
1. This island
 2. Another island of Maldives (name of island and atoll)
 3. Overseas (name of country)
30. Number of years lived continuously on this island
31. Reason for migration from last place of residence (check one)
1. Employment
 2. Business
 3. Education
 4. Family migration
 5. Marriage
 6. Medical
 7. Other (specify)

END INTERVIEW FOR CHILDREN UNDER SIX YEARS OF AGE

32. Ever attended an educational institution?
1. Yes
 2. No
 3. Not stated

33. Highest level of education completed: (specify grade for grades 1 to 12, then, 13 = local certificate, 14 = certificate or diploma less than one year, 15 = diploma more than one year, 16 = university degree.
34. Name of institution and year of completion of the highest level of attainment
35. For those who have completed grade five, place of completion
 1. This island
 2. Another island of Maldives (name of island and atoll)
 3. Overseas (name of country)
36. Whether currently attending any educational institution
37. Name of institution
38. Level currently attending
39. Ability to read and write with understanding (for those over 10 years of age who have not completed grade five)

END INTERVIEW FOR CHILDREN UNDER TWELVE YEARS OF AGE

40. Main activity last week
 1. Income generating activity
 2. Attending education/training
 3. Household chores
 4. Nothing
41. Whether engaged in ANY income generating work last week
42. If not whether there was a job or business from which the respondent was absent from during the reference week
43. Reason for absence
 1. On leave or vacation
 2. Failure of business
 3. Bad weather or seasonal factor
 4. Other reason
44. Whether looked for work last week
45. Reason for not looking for work
 1. Attending education/training
 2. Household work
 3. Income recipient
 4. No desired work available
 5. Not interested in work
 6. Unable to get any work
 7. Other (specify)
46. Industry of employment
47. Specific type of work or designation of job

48. Place of work
49. Type of establishment
1. Government department
 2. Parastatal/public enterprise
 3. Armed forces
 4. Local private establishment
 5. Foreign-owned private establishment
 6. Joint-venture establishment
 7. Own establishment or family venture
50. Category of employment
1. Employer
 2. Employee
 3. Own account worker (without employees)
 4. Unpaid family worker
51. Number of hours worked daily in that job
52. Any secondary employment during the reference week
53. Industry of secondary activity
54. Specific job of the secondary activity
55. Place of work of secondary activity
56. Type of establishment of secondary activity
57. Category of employment of secondary activity
58. Number of hours worked daily in secondary activity
59. Whether engaged in any income generating activity during January 1995
60. Marital status
1. Never married
 2. Married
 3. Divorced
 4. Widowed
61. Age at the time of first marriage
62. Number of persons married
63. Number of times married
64. Number of wives (for currently married males)

**END INTERVIEW FOR FEMALES UNDER TWELVE YEARS OF AGE
AND ALL MALES**

65. Whether any children born alive (record by sex of child)
1. Living with mother
 2. Living elsewhere
 3. Deceased
66. Whether any live births during the past year (26 March 1994 to 25 March 1995) – record by sex of child
1. Total births
 2. Total live births

END INTERVIEW FOR FEMALES UNDER FIFTEEN YEARS OF AGE

67. Whether currently pregnant
 1. Yes
 2. No
 3. Do not know

68. Whether currently using any contraception

Appendix 2 : Qualitative Studies – Summary and Interview Guide

i). Summary

Mahibadhoo – South Ari Atoll

Mahibadhoo island is located in South Ari atoll, which shares the Second Tourism Zone with North Ari atoll. The Second Tourism Zone, which is also known as the Ari Zone, was developed during the early 90s. Mahibadhoo has a population of 1,430 persons.

Although it is the capital of the atoll, it lacks many of the characteristics that are typical of most other atoll capitals of the country. However, it has an Atoll Education Centre, which has recently introduced secondary school level classes leading up to the GCE O level exams. It also has a Health Centre and also a recently dredged harbour.

Before the arrival of tourism in the atoll, people of this island were involved in tourism only in a very small way. Only a few number of fishermen in a couple of dhonis from this island were working for the resorts in Male' Atoll who were involved in the supply of fresh reef fish. The major share of income to the island was derived from semi-subsistence fishing in the atoll. They used to go and set up camp on uninhabited islands close to the most favourable fishing grounds for the season, so that they were able to salt and dry their daily fish catch. Mostly they stayed on these islands for a week at a time. When enough salted fish was accumulated, they then traveled to Male' and sold their products and came back home with supplies such as rice, flour, sugar and other basic needs for the families.

With the arrival of tourism in the atolls many of these fishermen went into contract with the resorts to supply them with fresh reef fish. This way they are guaranteed to get a fixed price per kilogram of fish they catch, irrespective of the size of the fish. They also get free food and accommodation on the resort when they have to stay there. When there is enough supply to last for a couple of days the resort management tells them to take a break so that they can come back home.

Those who do not go fishing get enough money from construction work in the island itself. They are also able to secure construction and carpentry contracts in some of the resorts. Such contracts pay them good money.

According to the elderly people of the island, the quality of life on the island has improved tremendously within their lifetime, more so during the past two decades. The most notable for them is the improvements in the quality of housing.

Fonadhoo island – Hadhdhummathi atoll

Fonadhoo is located halfway between Mahibadhoo and the southernmost point of the Maldives, which is Addu Atoll. Fonadhoo has a population of 1,458 persons. The unique characteristics of the islands of Hadhdhummathi Atoll is that they comprise some of the largest islands in the entire Maldives archipelago but the population of these islands have been relatively small and thus the islands have some of the lowest densities in the country. Recently, three of the islands have been joined by causeway, making inter-island transportation extremely convenient.

Community powerhouses in each ward of Fonadhoo island runs independent electricity generators from dusk to dawn. It is financed from the contributions of the island households and through money raised by the islanders from participating in development projects financed by the government. The Island Development Committee is currently undertaking a project of island electrification that is being financed by the island community. The project is currently in the final stages of its completion.

There is a public pay phone booth in each ward. People can make telephone calls to anywhere in the world from these booths using prepaid phone cards that are available for sale in local shops.

The people of this island have access to an Atoll Education Centre located in the middle of the two villages on the island. What is most unique about this island is that not many people of this island look for work in the resorts. They

are not fishermen either. Most of them find work at the domestic airport in the adjacent island, the fish freezing plant on a nearby island, the Atoll Education Centre and the government boarding house on the island, the Atoll Office, or other government establishments located on the island.

Although some people of this island used to go fishing earlier, this has never been a fishing village. Most people survived on subsistence farming of items such as coconuts, breadfruits, taro, tapioca and similar products, and by breeding chicken for sale at the markets in Male' for cash to purchase other essential items in Male'.

Until about 10 years ago, the administrative capital of the atoll was the island of Hithadhoo. However, the location of Hithadhoo on one end of the Hadhdhummathi atoll makes it an inconvenient location for the people from the rest of the islands in the atoll. Thus, by popular vote from the people of the atoll, Fonadhoo island was made the administrative capital of Hadhdhummathi Atoll in 1989.

Maradhoo-Feydhoo island – Addu atoll

Addu Atoll has a combined population of 18,000 persons, the second largest population center after Male'. Physically, Addu Atoll also has features similar to the causeway-linked islands of Hadhdhummathi Atoll. Of the five inhabited islands of Addu Atoll, four are connected by causeway. Gan, which is the southernmost of the four islands, is a former Royal Air Force Base from 1956 to 1976.

During the time of the British in Gan, people from the islands of Addu Atoll were employed in service occupations in areas such as the mess, pantry, kitchen, and the laundry. In addition to this some people were also employed in supervisory level jobs at the base and the air force hospital that was located in Gan. The services of the air force hospital were extended to all Maldivians free of charge. Through their employment in these areas in Gan, several people from the Addu atoll acquired skills that later proved to be invaluable human capital for their survival.

The departure of the British from Gan in 1976 left several people in Addu atoll unemployed and their families in disarray. It was a lucky coincidence that international tourism was just introduced in the Maldives a few years before that, and the types of skills that were needed for the budding tourism industry around Male' were exactly the kinds of skills that these people from the Addu islands possessed. The result was the largest flow of migration in the history of the Maldives occurred between Addu and Male'. Many left their families behind and sought employment in the newly developing resort islands.

The success of the tourism industry in its very early stages may be to a great part attributed to these readily available skills in this area. Some of the people who held more senior positions in the British administration in Gan, who obviously had more savings in the form of Sterling Pounds, capitalised on the opportunity to set up businesses in Male'. They have grown to be some of the most successful businesses in the Maldives today.

The mass migration from Addu Atoll to Male' island created several problems in the social and economic development of that atoll. Since most of the wealthy persons who migrated to Male' settled down leaving their land and houses unutilised by anyone. This has led to two major problems. One was that the land, which would otherwise have been used for agricultural purposes, remained totally unused. As the people who live on the islands needed more and more land for new housing all remaining land on the islands were exhausted. On some of these islands there is hardly any land left for the development of essential social and economic infrastructure.

From the time the British left Gan, until very recently, the condition of the islands of Addu remained more or less stagnant. In order to help the people of Addu, the government declared the former air force base in Gan as an export-processing zone and encourages foreign companies to set up factories there. Over the years several overseas companies have set up garments factories there. The initial investments failed for a number of reasons and more recently new companies have set up new state-of-the-art garment factories.

24-hour electricity and a modern telephone exchange that provides telephone lines to every home in the atoll has recently been set up. A new secondary school that caters for the student demands in the region has also been established. The airport that was constructed for the air force use has been upgraded so that large airplanes can land there even during the night. Currently international cargo flights operate direct to Gan and passenger flights operate between Male' International Airport and Gan. One tourist resort of 100 beds is currently in operation in Gan. Another larger resort is being planned on a nearby, uninhabited island in the atoll.

Maradhoo-Feydhoo has a population of 976 and is the smallest island in Addu Atoll. It is located on the second island after Gan. The other inhabited islands linked by causeway in Addu Atoll are Feydhoo, which lies between Gan and Maradhoo-Feydhoo, and Hithadhoo, which lies after Maradhoo. Hithadhoo is the administrative capital of the Atoll, where the Atoll Office, Regional Hospital, Regional Secondary School, Regional Communications Centre and other major infrastructure are located. With a population of 8,000, it is also the most populated single island after Male'.

Although the islands are linked by causeway, inter-island transport was not good until a couple of years ago. Therefore significant differences exist between the islands in terms of social and economic development. Maradhoo-Feydhoo is probably the least developed of the three islands. There are two other villages located on an island on the eastern reef of Addu Atoll.

Several households in the island have at least one of their male members working in a tourist resort in the tourism zones. Many are also employed in the trade sector in Male' island. Some are employed in various industrial establishments in Gan. There are only two fishing dhonis in the island and most of their catch is sold fresh within the atoll.

Many females who had worked earlier in garments factories in Gan expressed their willingness to work in that area. However the long hours and low pay were mentioned as the reason for their discontinuation. These observations are

based on the qualitative data collected in the above three locations on the basis of the following guidelines.

ii). Guidelines for the Qualitative Interviews:

For every person interviewed, basic data on the social, economic, and demographic characteristics of the person interviewed were collected. Detailed discussions were based on the following points:

- Housing and Amenities
- Housing and amenities
- How is housing financed?
- How much material cost is invested?
- How is material obtained?
- Extended or nuclear family living in a single house?
- Type of toilet used and views
- Types of food (vegetables and fruits)/Traditional, locally
- Adequacy of food
- Produced/imported non-traditional food
- Type of education (Traditional/Modern)
- The role of traditional methods of healing and treatment verses modern methods
- Main sources of news and information for the islanders
- Links with markets
- Availability of transport for goods from their communities to the markets in Male' or elsewhere.
- Availability of transport for goods from Male'
- Availability of passenger transport with Male' or other centre.
- For fisherman, the ease of converting their fish catches to cash. Different alternatives that were available earlier and are available now.
- Have the changes in marketability of fish affected their diet?
- Availability of consumer goods
- Availability of different types of consumer items in their own communities (such as the variety of goods available in local shops and their availability)

- Is the availability of consumer goods for the locals related to developments on the island or in the atoll
- How the income earning opportunities have been affected for the members of the community
- With the changes that are taking place at the national level (e.g. Growth of tourism, mechanisation and diversification of fishing sector), have the income earning opportunities increased or declined for the islanders?
- Opportunities that were available earlier but not now
- Opportunities that were not earlier available but available now
- Attitudes of those who have worked in the resorts and returned to the community. Have they possessed new/better skills?
- Any type of occupational specialisation for the islanders
- Do younger generations seem interested in sustaining the traditional occupations of islanders?
- If any seamen, what do they contribute to their families/community?
- Do they return with skills that have helped improve the community?
- Expatriate employment in the local community and areas
- In terms of educational opportunities have there been any changes in the past decades for the members of the community?
- More opportunities available locally?
- Opportunities available in the atoll but not in the island?
- How do people view the idea of sending children to schools in neighbouring islands?
- Have there been changes in peoples views on educating children
- Attitudes towards education of girls and boys
- Have the interest in education been the same as before?
- How would education of children be beneficial?
- What is the purpose of improving education? Is it better income? Better social status? To improve one's abilities? Other reason?
- Why do they want education for their children? What are their expectations? For girls? For boys?
- What are people's views on marriage and family size?

- What is the age at first marriage? Do girls and boys of today marry younger or older than their parents do?
- What is the present family size of the respondent? How does it compare with the parents' family size?
- What are the reasons for the preferred family size?
- Are larger families viewed as an economic benefit?
- Is there a concern about the family size and provision of education and care for one's children? Have there been any changes in these views?
- To what extent do people view family size in relation to the education of children?
- How do people view the issue of equal education for females and males and employment opportunities away from home? Any changes?
- Should women be educated at the same levels as men?
- Are there any benefits for the family in giving equal educational opportunities as men? Any changes?
- Do people envisage girls seeking work away from their own island or community?
- How do people view the issue of sending young people away for education and employment, and are there any gender biases and generational differences in these views?
- Are there any preferences in the kinds of economic activities for women/men?
- What are the reasons for preferences if any?

Appendix 3 : Indirect Estimates of Fertility by Different Methods

Stable population analysis is based on the assumption that the proportion of population under age 15 for both sexes combined is less affected by age misreporting than other points of the cumulated age distribution, except in some circumstances where there are high omissions of young children or avoidance of age 15 due to reluctance of women to be interviewed individually in surveys. In the case of the 1995 census age structure of the population of Maldives, which provided the proportion of population under 15, these particular forms of reporting errors do not appear to be of major concern (see Chapter 4).

An appropriate stable population was selected from the model stable populations published in the United Nations (1955) Manual II on the basis of l_5 (probability of surviving from birth to age five) obtained on the basis of indirect estimates of mortality from children ever born and children surviving data from the 1995 census using methodology discussed in Chapter 6. Since child mortality has been declining steadily in the recent past, the actual level of l_5 used is the average of estimated l_1 , l_3 and l_5 .

Stable population analysis provides an estimate of the average birth rate during the 15 years preceding the enumeration. This estimated birth rate matches closely with the average birth rate during this period even when the population in question is far from stable, and assuming that the underlying data are correct, this method is known to produce a very accurate estimate of the birth rate regardless of the family of model stable populations used in the calculations (United Nations, 1983:167 and 171).

The reverse survival method uses census data, normally classified by five-year age groups and sex up to age 10, the total population at the time of enumeration, an estimate of the growth rate and the value of l_2 (the probability of surviving from birth to age two) for the construction of a life table up to age 10. It provides estimates of average birth rates for the five year period preceding the census and the ten year period preceding the census, by reverse

surviving the number of persons enumerated in a given five year age group. Of course, the reliability of the estimates derived by this method depend on the accuracy of the completeness of counts in these two age groups and the accuracy of age reporting for the relevant age groups. Reverse survival estimates of births from the enumerated population in the age group 0 to 4 are likely to be affected by under enumeration of children, especially under one year of age. This may cause the estimated birth rate to be lower than the actual birth rate. On the other hand the estimates of mortality used in the reverse survival of population in the age group 5 to 9 is more likely to be erroneous. This age group is also more likely to be subject to age-reporting errors, for example, heaping at age five.

Table A3-1: Fertility Estimates for the Maldives by Different Methods from 1995 Census Data

Method of estimation and reference period	Crude Birth Rate	Total Fertility Rate	Gross Reproduction Rate
Stable Population Analysis (1980-1995) based on C(15), $l_5=0.964$ and West Model level 15.44, $r=3.07$	44.1	6.86	3.35
Reverse Survival Method (1985-1990), West Model level 15.44, $r=3.07$	49.6	-	-
Reverse Survival Method (1990-1995), West Model level 15.44, $r=3.07$	37.1	-	-

Source: Computed by the author

The estimate of the birth rate obtained by the reverse survival method appears to be lower than the estimate obtained by the stable population analysis for the same period discussed above. The stable population estimates refer to the average birth rate for the 15-year period before the census year 1995. The reverse survival estimates refer to the five-year period prior to census and the previous five-year period. Comparison of estimates by the different methods referring to different periods in the past reveals significant variations in the estimates. These variations may be partly caused by the effect of an upward shift in the enumerated population from the under-five age group to the age group 5 to 9. It also indicates that fertility may have declined during the decade preceding the 1995 census.

Brass, (1964) was the first to propose a method of adjusting reported data on births in the past year. The simple idea of comparing lifetime fertility of a woman (children ever born) with cumulated period fertility of reported births in the year preceding the survey was the basis of this method. He argued that even if the level of recent fertility could not be accepted due to possible reporting errors, the age pattern of fertility could be, since the proportionate error might be more or less constant with mother's age. Similarly, the likelihood of younger women, having experienced fertility more recently, to report their lifetime fertility more accurately than older women makes their lifetime fertility more reliable. Brass proposed to use the two most reliable parts of this information to scale the age pattern of fertility from the reported births in the past year to match the level of fertility observed from the lifetime fertility of younger women.

Following the initial introduction of the above mentioned technique by Brass (1964) several methods of estimating fertility using information on children ever born have been developed. They are: the P/F (Parity/Fertility) ratio method developed by Brass (Brass et. al., 1968), which uses the average number of children ever born to women in five year age groups and the pattern of fertility; the P1/F1 ratio technique (Brass, 1975), which uses a similar rationale but determines the accepted fertility level based on the first births only; relational Gompertz technique developed by Brass (1981), which uses information on average number of children ever born by age of mother and the pattern of fertility, and Arriaga technique (U.S. Bureau of the Census, 1983, cited in Arriaga, 1994) in which P/F ratio was modified and extended to the situation of changing fertility.

The first three of these methods make the assumption of constant fertility, but the last two techniques do not require knowledge of the fertility trends in the past. The P1/F1 ratio technique is very similar to the P/F ratio method discussed above. Although the P1/F1 ratio method is less likely to be affected by changing marital fertility, and have many advantages such as its reliance on data that are in many ways more likely to be accurate, any change in the age at first marriage, which influences the timing of the first birth in a society like the

Maldives, is likely to bias the results yielded by this method. As we will see from the analysis of data on age at first marriage in the Maldives (see section 5.3.2.1) the age at first marriage has been changing in the recent years. This makes the P1/F1 ratio method less suitable for the analysis of fertility in the Maldives. Techniques that use children ever born classified by the duration of marriage may also not be suitable, as the frequency of divorce and remarriage is high in the Maldives (see section 5.3.2.2).

Arriaga's technique (U.S. Bureau of the Census, 1983, cited in Arriaga, 1994) estimates fertility rates based on information on the average number of children ever born, by age of mother and a pattern of fertility. The pattern of fertility can be either from registration data or from the question of number of births a woman had in the year preceding the census. If the data are available for only one date, the assumptions, advantages and limitations are the same as those for the P/F ratio technique developed by Brass (Arriaga, 1994:233). When data are available from two censuses, age specific fertility rates are estimated for one year before the later census and one year after the earlier census. Under this modified method, recorded children ever born data are transformed into estimates of age-specific fertility, through graduation by a 9th degree polynomial, rather than transforming the recorded age-specific fertility data, as required by Brass P/F ratio, to CEB-type figures. The two sets of age-specific fertility rates (reported and transformed) are then cumulated by age, and the ratios of these cumulated figures provide possible adjustment factors (Arriaga, 1994:233).

The underlying assumptions of the Arriaga's technique are as follows: The completeness of reporting of births used to estimate the age specific fertility rates is the same for all age groups of women; reporting of the average number of children ever born per woman is complete (at least for women under 30 years or 35 years of age); changes in fertility produce a linear change in the average number of children ever born per woman at each particular age of women (mainly at ages 15 to 35 years) between the two dates; fertility occurs only between exact ages 15 and 50 years. Judging from the age pattern of mean

parities and current fertility rates in Table 5-1 and Table 5-3, these assumptions appear to be justified for the population of Maldives.

Estimates of fertility obtained by using Arriaga's method are subject to two sources of errors: Errors in the data on children ever born and errors in the age-specific fertility rates. In the first source, age misreporting of women providing these data will have an unpredictable effect and under-or-over reporting of children ever born by women under 35 years of age will affect the estimates. When the level of completeness of children ever born reported is different in two censuses, the estimates of fertility will be affected. This will result in incorrect fertility trend estimates. This will occur mostly when census data are compared with survey data. When the technique is applied without the use of a fertility pattern, the resulting estimates should be interpreted with caution. In the second source of error, the errors in the fertility pattern used in the analysis will be transferred to the estimated age specific fertility rates. Again, errors in age reporting of women will have an unpredictable effect (Arriaga, 1994). These factors should be kept in mind when interpreting the estimates of fertility derived from such indirect techniques of estimation.

Appendix 4 : Developing the Index of Household level of Development

The Index of Household level of Development was developed by the procedure discussed below. The contributions of each of the household variables on which data are available from the census of 1995 to IHD are shown.

Housing Quality

Quality of housing unit, as indicated by the materials used for the construction of the major part of the walls, roofs and floors as reported in the census of 1995 provides useful information on the households' capability to invest in the betterment of the lives of its members. In the Maldives, a housing plot or division is normally provided by the government to those who are interested and where the existing land area of a given island permits. Having no established system of borrowing finance for housing construction, the housing unit constructed on one's assigned plot is directly related to one's ability to save for the necessary material such as cement, wood, and roofing sheets. The quality of material used for the construction of the housing unit is therefore a good indicator of the households' access to income earning opportunities and the ability to save.

This section identifies the different types of materials used for the construction of housing units from information reported in the census of 1995. After identification of a set of categories for each part of the housing unit, appropriate weights are assigned on the basis of the relative value of a particular category in relation to the other categories.

a) Walls

The types of material used in the construction of the walls were originally classified into eight categories (see Annex I). These categories were re-coded by the author to arrive at the categories and the corresponding weights shown in Table A4-1.

Table A4-1: Type of Material Used for Walls and their Corresponding Weights

Wall type	Frequency	Percent	Weights
Thatch and other	185	5.8	3
Wood, plywood, unplastered masonry	1461	46.1	8
Plastered masonry, concrete	1522	48.0	9
Total	3168	100.0	

b) Roof

The materials used for the roofing were originally classified into four categories (Annex I). The reclassifications of these into three categories and the corresponding weights are shown in Table A4-2.

Table A4-2: Type of Material Used for Roofs and their Corresponding Weights

Roof type	Frequency	Percent	Weights
Thatch	19	.6	3
Corrugated sheets and other	3122	98.5	10
Concrete sheet	27	.9	12
Total	3168	100.0	

c) Floor

The six categories of types of flooring of dwelling units given in the census questionnaire were merged to form three categories. These three categories and their corresponding weights are given in Table A4-3.

Table A4-3: Type of Material Used for Roofs and their Corresponding Weights

Floor type	Frequency	Percent	Weights
Sand	215	6.8	1
Wood, plywood, cement, other	2898	91.5	5
Concrete sheet, tiled floor	55	1.7	7
Total	3168	100.0	

Consumer Durables

Information on six consumer durables from the census was coded according to their availability for household consumption. 1) Yes 2) No 9) Not stated. For the development of an index of household possession of consumer durables,

the availability of a particular item was given a weight in terms of the approximate cost of the item. Since it was assumed by the present author that an ordinary transistor radio would cost approximately Rufiyaa 500.00, a weight of 1 was assigned when a radio was available. Weights for other items were given in relation to the price of a radio as shown below. The sum of these weights reflects the relative standing of a household in terms of ownership of consumer durables. The frequency distributions of households by different combinations of these consumer durables are given below Table A4-4.

1	Radio
2	Stereo
10	Television
10	Video
10	Washing machine
12	Refrigerator

Table A4-4: Sum of Weights for Possessions

Weight	Frequency	Percent	Cumulative Percent
0	231	7.3	7.3
1	1142	36.0	43.3
2	129	4.1	47.4
3	306	9.7	57.1
10	18	.6	57.6
11	234	7.4	65.0
12	45	1.4	66.4
13	146	4.6	71.1
14	3	.1	71.1
15	10	.3	71.5
20	17	.5	72.0
21	65	2.1	74.1
22	45	1.4	75.5
23	122	3.9	79.3
24	9	.3	79.6
25	38	1.2	80.8
30	3	.1	80.9
31	36	1.1	82.0
32	32	1.0	83.0
33	72	2.3	85.3
34	32	1.0	86.3
35	41	1.3	87.6
42	5	.2	87.8
43	78	2.5	90.2
44	106	3.3	93.6
45	203	6.4	100.0
Total	3168	100.0	

These sums of weights are re-coded into three broad categories as follows:

- 1 None, or either or both radio and stereo (weights 0 to 3)

- 2 Any one of the other items and either or both radio and stereo (weights 10 to 15)
- 3 Two or more of other with or without radio/stereo (weights 20 to 45)

Table A4-5 provides the distribution of households according to these three categories.

Table A4-5: Households by Different Categories of Consumer Durables

Category	Frequency	Percent
1) None, or any or both radio/stereo	1808	57.1
2) Any one of the other items and either or both radio/stereo	456	14.4
3) Two or more of other with or without radio/stereo	904	28.5
Total	3168	100.0

Composite Index of Household level of Development (IHD)

In order to establish which of these variables can be included in an index that truly reflects the levels of development at the level of the household in the Maldives, cross tabulations were made first, between the different aspects of housing quality.

The cross tabulation of wall by roof indicated almost no variation of wall types by types of roofing material used. In almost 99 percent of the cases, the type of roofing was reported to be 'corrugated sheets and other materials', while there was more variation with the type of walls of the housing unit. Hence, it was decided that the type of roofing would not provide any additional dimension to the index (Table A4-5).

Table A4-6: Households by Type of Wall and Type of Roof

Roof type	Wall type			Total
	Thatch and other	Wood, plywood, unplastered masonry	Plastered masonry, concrete	
Thatch				
Households	14	4	1	19
Percent	0.4%	0.1%	0.0%	0.6%
Corrugated sheets and other				
Households	171	1451	1500	3122
Percent	5.4%	45.8%	47.3%	98.5%
Concrete sheet				
Households		6	21	27
Percent		0.2%	0.7%	0.9%
Total				
Households	185	1461	1522	3168
Percent	5.8%	46.1%	48.0%	100.0%

The other aspect of housing quality for which data was collected in the census is the type of material used for the floor. Cross tabulation of wall by floor type shows that the distribution of housing units by different types of flooring was only slightly different from the distribution by type of roofing. Thus, similar to information on the quality of roofing, information on type of flooring is not likely to significantly add further dimension to the proposed index (Table A4-7).

Table A4-7: Households by Type of Wall and Type of Floor

Floor type	Wall type			Total
	Thatch and other	Wood, plywood, unplastered masonry	Plastered masonry, concrete	
Sand				
Households	97	111	7	215
Percent	3.1%	3.5%	0.2%	6.8%
Wood, plywood, cement, other				
Households	88	1336	1474	2898
Percent	2.8%	42.2%	46.5%	91.5%
Concrete sheet, tiled floor				
Households		14	41	55
Percent		0.4%	1.3%	1.7%
Total				
Households	185	1461	1522	3168
Percent	5.8%	46.1%	48.0%	100.0%

The above analysis shows that out of the three different aspects of housing quality, the type of material used for the construction of the walls is the only

indicator that varies significantly across different households in the Maldives. Cross tabulation of wall type by categories of consumer durables (Table A4-8) suggest that a composite index, incorporating these two indices can be derived through combinations of the different levels of the two indices.

Table A4-8: Wall Type by Possession of Consumer Durables

Categories by consumer durables	Categories by type of wall			Total
	Thatch and other (Low)	Wood, plywood, unplastered masonry (Medium)	Plastered masonry, concrete (High)	
None, or any or both radio/stereo (Low)				
Households	160	1029	619	1808
Percentages	5.1%	32.5%	19.5%	57.1%
Any one of the other items and either or both radio/stereo (Medium)				
Households	24	205	227	456
Percentages	0.8%	6.5%	7.2%	14.4%
Two or more of other with or without radio/stereo (High)				
Households	1	227	676	904
Percentages	0.0%	7.2%	21.3%	28.5%
Total				
Households	185	1461	1522	3168
Percentages	5.8%	46.1%	48.0%	100.0%

The stronger of the two indices in terms of its spread across all households appear to be the index of consumer durables. Thus, the following re-groupings were derived (see Table A4-9):

Table A4-9: Combinations of Wall Type and Consumer Durables by Five Levels of the Index of Development

Categories from High = 1 to Low = 5	Wall type	Consumer durables
1	High	High
2	Low or Medium	High
3	Medium or High	Medium
4	Medium or High	Low
5	Low	Low or Medium

Cross tabulations of the various independent variables with the above composite index are provided in Table A4-10. It appears that for all

independent variables proportions in categories two and five are rather small compared to the categories one, three and four. Perhaps three categories of the composite index would thus be more appropriate. Since ownership of consumer durables appear to be a stronger indicator of the level of affluence of a household than housing quality, the major weight in merging the categories is given to the former.

Table A4-10: Composite Index of Development (five levels) by Various Socio –Economic Variables

Independent variable	Composite Index (1 = High to 5 = Low)					Total %	Total (n)
	1	2	3	4	5		
Distance from tourism zone							
Within zone	53.7	13.6	12.5	19.4	0.8	100.0	840
Periphery of zone	14.2	3.9	15.6	61.3	5.0	100.0	282
Outside zone	7.8	3.1	12.2	68.5	8.5	100.0	1371
Distant from zone	11.6	9.0	17.2	55.3	7.0	100.0	675
Type of household							
Nuclear	13.7	5.0	12.1	60.5	8.7	100.0	1475
Extended	28.0	9.1	14.9	44.7	3.3	100.0	1693
Sex of household head							
Male	23.1	7.4	13.2	50.5	5.9	100.0	1536
Female	19.7	7.0	14.0	53.5	5.8	100.0	1632
Lifetime migrant status							
Migrant	27.2	10.7	11.6	43.9	6.6	100.0	847
Non migrant	19.2	5.9	14.4	55.0	5.5	100.0	2321

The final three categories are derived by combining the five categories shown in Table A4-10. The three categories thus obtained are shown in Table A4-11.

Table A4-11: Combinations of Wall Type and Consumer Durables by Three Levels of the Index of Development

Categories from High = 1 to Low = 5	Wall type	Consumer durables
1	Any level	High
2	Medium or High	Medium
3	Medium or High	Low
3	Low	Low or Medium

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