Revisiting Malaysia's Population–Development Nexus

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The Past in Its Future

Edited by

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Abbreviations

ADB	Asian Development Bank
AIDS	acquired immune deficiency syndrome
ARV	antiretroviral therapy
ASEAN	Association of Southeast Asian Nations
CBR	crude birth rate
CEPAR	Centre of Excellence in Population Ageing Research (Australia)
CO_2	carbon dioxide
CPI	consumer price index
CSIRO	Commonwealth Scientific and Industrial Research Organisation
CT	computerised tomography
DALYs	Disability Adjusted Life Years
DOSM	Department of Statistics Malaysia
EE	electronic and electrical
EPF	Employees Provident Fund
EPU	Economic Planning Unit (Malaysia)
ESCAP	Economic and Social Commission for Asia and the Pacific (United Nations)
ESD	education for sustainable development
FELDA	Federal Land Development Authority
FDI	foreign direct investment
FiT	Feed-in-Tariff
FFPAM	Federation of Family Planning Associations Malaysia (now known as FRHAM – Federation of Reproductive Health Associations Malaysia)
FPAs	Family Planning Associations
FWI	Family Wellbeing Index
GAP	Global Action Programme
GDP	gross domestic product

GIS	Geographic Information Systems
GNI	gross national income
GNP	gross national product
HDI	human development index
HIES	Household Income Expenditure Survey
HIV	human immunodeficiency virus
ICOR	incremental capital output ratio
ICPD	International Conference on Population and Development
IDEAS	Institute for Democracy and Economic Affairs
IMR	infant mortality rate
IP	intellectual property
IPCC	Intergovernmental Panel on Climate Change
IPPF	International Planned Parenthood Federation
MDGs	Millennium Development Goals
MIPAA	Madrid International Plan of Action on Ageing
MNCs	multinational companies
MOH	Ministry of Health (Malaysia)
MPFS	Malaysian Population and Family Surveys
MRI	magnetic resonance imaging
Mt	million tons
Mtoe	million tons of oil equivalent
MWFCD	Ministry of Women, Family and Community Development
NBOS	National Blue Ocean Strategy
NEAC	National Economic Advisory Council (Malaysia)
NEM	New Economic Model
NESDB	National Economic and Social Development Board
NGO	non-governmental organisation
NIEs	newly industrialised economies
NO$_2$	nitrogen dioxide
NOSS	National Occupational Skills Standards
NPE	National Philosophy of Education (Malaysia)
NPFDB	National Population and Family Development Board
NPW	National Policy on Women
NRR	Net Reproduction Rate
NSP	National Social Policy
OECD	Organisation for Economic Co-operation and Development
OOP	out-of-pocket
PAYGO	pay-as-you-go

PISA	Program for International Student Assessment
PLHIV	people living with human immunodeficiency virus
PM10	particulate matter
PoA	Programme of Action
R&D	research and development
RE	renewable energy
RM	Ringgit Malaysia (currency)
SREP	Small Renewable Energy Power Program
STPM	Sijil Tinggi Persekolahan Malaysia (Malaysian Higher School Certificate)
TFP	Total Factor Product
TFR	total fertility rate
TIMSS	Trends in International Mathematics and Science Study
TVET	technical and vocational education and training
UHC	universal health coverage
UMNO	United Malays National Organisation
UN	United Nations
UNCT	United Nations Country Team
UNEP	United Nations Environment Programme
UNESCO	United Nations Educational, Scientific and Cultural Organisation
UNFCCC	United Nations Framework Convention on Climate Change
UNFPA	United Nations Fund for Population Activities (now known as United Nations Population Fund)
US(A)	United States (of America)
VIF	variance inflation factor

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PREFACE

Malaysia has undergone fundamental changes from a rural agrarian-based economy to a more diversified economy. The proportion of workers in the labour force engaged in agriculture and mining declined from 53.5% in 1970 to 11.4% in 2012, with a corresponding increase of workers in the manufacturing and services sectors. An influx of foreign workers followed rapid economic development and the tightening of the labour market since the early 1990s. High economic growth rates and the implementation of various welfare enhancing programmes have contributed to a strong rise in Malaysia's Human Development Index. The Poverty Eradication Programme has succeeded in reducing the incidence of poverty to 3.9% in 2009 from 49.3% in 1970.

Socio-economic development has also brought about dramatic changes in the demographic landscape in Malaysia. The proportion of population living in urban areas increased from close to a third in 1970 to over two-thirds in 2010. The mortality rate in Malaysia has fallen to a rather low level by international standard. The fertility rate has also been declining; reaching replacement level in 2012 (total fertility rate of 2.1 children per woman). Delayed and non-marriage, along with wider usage of contraception are the two most important proximate determinants that result in fertility reduction. However, unmet needs for contraception have remained high. Fertility and mortality declines have brought about significant age structural shifts. Although the population is still relatively young, ageing has increasingly become a concern, particularly as existing social security schemes are deemed inadequate in providing for the financial needs of the growing number of old people.

Population changes and socio-economic development are closely inter-related. Development affects population processes, such as fertility, mortality and migration, which have a direct impact on demographic outcome that in turn affects development. The ultimate goal of development planning is to improve the wellbeing of the people. Hence, it is imperative that

population factors should be incorporated in development planning. There is therefore a need to assess the linkages between population dynamics and development in the various sectors, and to suggest strategies and programmes. In the closing stages of a 20-year Program of Action adopted at the 1994 International Conference on Population and Development (ICPD) and Millennium Development Goals (MDGs), it is timely to take stock of the progress made, discuss emerging issues and challenges and recommend strategies to address these challenges, based on past experience and international lessons. Hence, the Population Studies Unit, under the Faculty of Economics and Administration of the University of Malaya in collaboration with the National Population and Family Development Board convened a national conference to deliberate on the inter-relationships between population dynamics and development on 26 June 2014. This book brings together the writings and thoughts of eminent scholars/practitioners on major issues expressed in papers presented at the conference.

The publication of this volume is made possible by the contributions of many individuals. We thank Rohani Abdul Karim, Minister of Women, Family and Community Development for officiating the conference, Mischelle Gyles-McDonnough, UN Resident Coordinator for her special message, and Napsiah Omar, chairman of the National Population and Family Development Board for closing the conference. We would also like to record our gratitude and appreciation to Gavin Jones for sharing his vast knowledge on the inter-relationship between population and development in his keynote address. The authors benefitted from the valuable suggestions and comments from the conference participants which have been incorporated into the papers.

We are naturally most grateful to all the authors of this volume for their thoughtful contributions to the conference, with subsequent exchanges and revisions incorporated into individual chapters that are the products of a two-day workshop at Port Dickson on 27-28 November 2014.

Special thanks are also due to Siti Norlasiah Ismail, Director General of the National Population and Family Development Board and her officers for working closely with the Population Studies Unit of the University of Malaya in hosting conferences on population issues, and in carrying out demographic research. We are also indebted to the management of the University of Malaya and the Faculty of Economics and Administration, particularly dean Noor Azina Ismail and colleagues at the faculty, for their constant encouragement and support.

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FOREWORD

Development, though not confined to the economic realm, has invariably been associated with it. In a world where economic backwardness and poverty was widespread just half a century ago, economic development must be seen as the panacea and therefore a prime directive for governments and development planners. But confining development to economics does not make the concept any simpler – economic development is itself multi-dimensional and its very nature changes with time. It has also generated both optimism and pessimism, while the drive for economic development itself has both been lauded for its impact on reducing poverty and criticised, most recently, for its lack of regard for environmental sustainability.

At the heart of the opposing sentiments of optimism and pessimism is the role of population. Optimists believe economic growth can outpace population growth whereas pessimists feel the opposite. Pessimism in the 1960s gave way to optimism in the 1980s and 1990s when the world saw explosive economic growth in East Asia. Yet within the next two decades, pessimism returned, albeit in a different guise. This time, fertility transition in many countries has seen rapid decline in population growth to the point where concern of an ageing population is increasingly articulated.

From a policy perspective, population is seldom regarded with the same degree of urgency as issues like fiscal management, financial policy, or even regulatory policies. Yet significant impact it most certainly has, even if spaced over a longer period of time.

This volume, an update of the seminal work on population–development nexus in the 1980s, is therefore a timely reminder that population issues are very much prescient, and that they need to be addressed urgently. In rescuing the population discourse from the back-burners of policy and academic dialogue, this volume highlights the population issues that will impact this nation sooner than expected. These issues include the ageing of the population, with implications for the government's fiscal burden and demand patterns for health services and housing at the macro- and

sectoral levels but also for families at the micro-level. The focus is on the quality of the population, the so-called "human capital" that is needed to drive Malaysia to achieve Vision 2020. They also include the inexorable migration from rural locations to urban, especially metropolitan areas, leading to depopulation in the former and congestion in the latter, with all the environmental consequences.

Although not all major issues are covered in this volume, its editors and authors are to be complimented for bringing many themes to the forefront of discussion, and pulling together the chapters into a coherent, compelling story. There are major lessons of experience and implications from which policymakers can draw for policy. It is a study whose time has definitely come. Let us hope it will not take another three decades for the next update.

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THE POPULATION DEVELOPMENT
RELATIONSHIP IN MALAYSIA

Cheong Kee Cheok, Tey Nai Peng and Rajah Rasiah

Introduction

When the monograph *Demographic Impact on Socio-economic Development: The Malaysian Experience* (Cheong and Lim, 1982) was published, the country's demographic and economic scenes were characterised by considerable dynamism. Demographically, the high rates of population growth of 3.2% per annum in 1960-63 had eased to 2.3% per annum in 1975-80 (United Nations, 2012). Although population growth rebounded to 2.6% per annum in 1980-85, few had expected it to rise dramatically again after that. Indeed, following the announcement of a new population policy in 1982 to achieve an ultimate population of 70 million by 2100 and the adoption of pro-natalist measures, the population grew at a faster rate to reach 2.9% per annum in 1985-90. However, the effect of the new policy on childbearing was short-lived, as the rate of population growth quickly took a downturn to reach 2.4% per annum in 1995-2000, and further to 1.8% per annum in 2005-10, despite the influx of foreign workers during the last two decades. The slower rate of population growth has been brought about by rapid decline in fertility which reached replacement level (total fertility rate of 2.1 children per woman) in 2010, in tandem with urbanisation (doubling from 34% in 1980 to more than 70% today) and modernisation.

Economically, the decade of 1970-80 has seen the country's transformation from an agricultural economy to one based on manufacturing. The transition from import substitution in the 1960s to export promotion in the 1970s had been highly successful; average annual gross domestic product

(GDP) growth rates had increased from an already respectable 6.4% per annum in the period 1960-70 to 7.1% per annum over the period 1970-80 (World Bank, 2014). The 1970s also saw a major shift from agriculture to manufacturing as export-oriented labour-intensive multinationals relocated production operations primarily in the Free Trade Zones that were opened in 1972 (Rasiah, 1995). Western peninsular Malaysia was the biggest beneficiary of the export-oriented industrialisation policy of the government that was launched through the Second Malaysia Plan (Malaysia, 1971; Rasiah, 1993). In addition, the 1970s also saw massive expansion in irrigation and drainage as the government targeted the rural areas for development to alleviate poverty in the country.

The government shifted its focus again to import-substitution industrialisation since 1981, which included the provision of rents to nationally-controlled heavy industries and the reduction of incentives for export-oriented foreign firms without a simultaneous focus on human capital development undermined economic growth since the 1980s. This along with a cyclical trough in the electronics industry caused a contraction in GDP in 1986. Hence, GDP on average only grew by 6.2% per annum in 1980-90 (World Bank, 2014).

However, three decades later the demographic landscape of the country had changed! The fertility transition has almost been completed, with population growth in 2013 having fallen to 1.6%. Hence, concerns about rapid population growth have since given way to worries about labour shortage and an impending ageing population with consequences for social security and old age support. The dramatic changes in the economic structure placed particular demands on development planning, with expenditure on education and training, as well as, for basic needs areas of priority. While this did indeed occur, Cheong and Lim (1982: 103) argued that an integrated population policy or comprehensive population strategy had not been put in place, and there was a lack of consistency between macro-level and regional-level planning. Much less attention has been given to population factors since the Fifth Malaysia Plan (1986-1990). Hence, it is not surprising that the country remains saddled with serious human capital problems, which is reflected in low intensities of R&D scientists and engineers in the population (Rasiah and Chandran, 2015) and falling performance of school students in the field of sciences (Cheong, Viswanathan and Goh, 2011).

The heavy focus on economic growth without major inroads into raising human capital raised other issues. The massive inflows of foreign direct

investment over the period 1987-93 with no significant improvement in technological deepening caused severe problems in the country (Rasiah, 2011). On the one hand, rising demand-side pressures tightened the labour market, which led to massive imports of foreign labour. In addition to some two million legal contract workers, Malaysia is host to roughly an equal number of illegal migrants. On the other hand, the slow supply response caused severe overheating in the economy. The massive inflows of foreign capital into Malaysia saw the appreciation of the ringgit against the US dollar, which added to the growing current account deficits experienced by the country until 1997. The inability of the macroeconomic regime in the country to correct the current account imbalances as the country was characterised by flexible currency (despite the quasi peg) and capital markets exposed the country to external currency attacks. The fuel for the attack was already lit with the Thai economy, which succumbed first as the country also faced enormous short-term debt service problems. Hence, the crash in the Thai bhat led a contagion that ravaged South Korea, Indonesia, Philippines and Malaysia (Rasiah, 2000). Hence, despite the strong growth rates exceeding 9% in the early 1990s, Malaysia's annual average GDP growth rate fell to 5.1% between 1999 and 2013.

As the economy began to mature, and as the economies of China, Indonesia and the transition economies of Indo-China became more competitive in labour-intensive production, Malaysia's export competitiveness began to decline even more after 2000 than in the 1990s. The lack of human capital deepening and the low commercialisation yields achieved from innovation inputs did not help (see Wong and Goh, 2010a; 2010b; Rasiah and Chandran, 2015). Hence, despite the base being larger than previously, annual average GDP growth rates fell to 3.9% per annum in 2000-10 (World Bank, 2014).

What has changed is not just the magnitude of growth. How growth is to be achieved has also changed. The Asian financial crisis represented but a watershed, not the cause of Malaysia's slowing growth. What had occurred even before its onset was the gradual erosion of competitiveness of Malaysia's low labour cost model to emerging neighbours like Indonesia and Vietnam with large pools of low cost labour. It is therefore not sufficient for Malaysia simply to drive exports, as it had done since the 1970s. What Malaysia needed to do to avoid falling into the "middle-income trap", argued Gill and Kharas (2007), was to move up the value-added chain through enhancing technological capability (Rasiah, 1999). To do that, as Korea and

Taiwan have done, requires accumulation of human capital, a factor that reemphasises the close link between population and development.

While the writing on the wall was murky in the 1990s, it had become crystal clear after the Asian financial crisis that the government's policy response and planning priorities must change to direct more resources at human capital deepening and research universities but without losing sight of markets. While economic priorities must now be accorded to strengthening human capital, enhancing technological capability, and ensuring sustainable growth, the social imperatives are to manage ageing as well as the flow of migrants. With the Klang Valley becoming increasingly dominant demographically and economically, the need for a more balanced regional development has never been more pressing. Towards these ends, the government has established five development corridors since the Ninth Malaysia Plan (2006-2010). However, the effectiveness of the development corridors to achieve the objective of a more balanced regional development remains to be seen.

These fluctuations in growth rates notwithstanding, Malaysia has achieved remarkable progress in social development. The human development index (HDI) – a composite index based on income, educational attainment and health – has improved from 0.577 in 1980 to 0.773 in 2013. The gross tertiary enrolment ratio has improved from 4.0% (3.1 for females and 5.1 for males) in 1980 to 35.9% (39.1 for females and 32.7 for males) in 2011. During this period, life expectancy for females and males has increased from 69.6 years and 66.6 years to 77.2 years and 72.6 years respectively. Between 1980 and 2011, the per capita GDP increased almost threefold from USD2,318 to USD6,531 (constant 2005 USD) (World Bank, 2014). The mean monthly gross household income has increased from RM1,098 in 1984 to RM5,000 in 2012. Consequent upon rising income, the incidence of poverty has declined from 20.7% to 1.7% over this period (http://www.epu.gov.my/en/household-income-poverty).

The changed circumstances in the population–development nexus provide the rationale for this volume, with contributions by both the academic community and by government. Updating this vital relationship requires both an understanding of broad trends and of specific issues. Thus, in the first part of this volume, Jones (Chapter 2) reviews trends in population and developments in Asia over the past three decades while Tey *et al.* (Chapter 3) discuss population projections for the country's development planning. Siti Norlasiah *et al.* chart the evolution

of population and family policies in Malaysia (Chapter 4). Major issues Malaysia currently face and/or will continue to face in future are the substance of Part 2.

The Evolution of the Population–Development Nexus

Although set within the context of the debate regarding whether population growth impacted income growth, Malaysia's demographic experience spoke more to the East Asian phenomenon, articulated by Mason (2003), of rapid fertility transition produced by a combination of economic factors as well as government policy. In making this observation, Jones noted in Chapter 2 that this rapid fertility transition in Asia was accompanied by equally stellar economic advance. While the precise mechanisms that link both developments are complex, a few linkages, running from population to the economy and vice versa, are clear. One is, Jones noted, the age structure, reflected in a growing economically active population and a low dependency ratio, which has been beneficial to socio-economic development. Another is the role of population policies, and their ability or lack thereof, to adjust to the pace of fertility decline.

These more recent developments are part and parcel of the dynamic nature of population and economic growth. Jones points to the specific issues that Malaysia's policymakers need to deal with. The population's impact on the environment, regulated or abetted by government policies, must be among the most important. The quality of Malaysia's human capital, the product of the country's education and training system, is another. Malaysia's achievement of the Millennium Development Goal for education counts little if education quality is compromised. Even as what Jones referred to as the "window of opportunity" offered by the fertility transition arrives, concern is now expressed over the onset of ageing. This demographic phase has implications for both families as well as for the government. A final issue is that of migration, in the form both of low-skill labour imports and of high-skill brain drain, which impacts the local population in ways positive and negative.

Policymakers anxious to confront these and other issues must rely on planners who can create likely scenarios from which consequences of policy actions or lack thereof can be identified. Planners in turn rely on data. The data that are relatively reliable over the medium term and are vital for planning social services implied by a particular population

size and structure are population projections. Tey, *et al.* provide these projections, specifically, "to illustrate the requirements for education, health and economic sectors in terms of human resources, infrastructure and expenditure to meet the needs of the population" (Chapter 3, p. 41).

The existing population structure and growth were the starting points for projections using the cohort components method to yield data for the period 2010 to 2040. Their key finding was a progressive decline of the population growth rate to just 0.5% in year 2040. The projected population age structure was then used to estimate requirements for education and health services, as well as the number of jobs that needed to be created as the labour force grows. The authors provide a timely reminder that the use of projections they made for development planning, represent but a first cut at identifying where the greatest needs lie. Fortunately, whatever shortcomings attendant upon the use of mechanistic projections have been made less serious by the retreat from development to indicative planning that has taken place.

Of the many policy levers that impact population and socio-economic wellbeing, those relating to population programs are the most direct. These, implemented under the purview of the National Population and Family Development Board (NPFDB), rely on a subset of population data on fertility rates, age at first marriage, number of households, average household size, and family structure, as stated by Siti Norlasiah *et al.* (Chapter 4). Together with a narrative on the evolution of population policy, the authors also stressed the importance of a multi-faceted strategy that goes beyond family planning to target family welfare. Representing the NPFDB, the authors of this chapter would naturally give credit for the fertility decline to the efforts of the NPFDB (Chapter 4, p. 69). That this view is too simplistic is clear from the authors' own admission that "due to the rapid pace of development and industrialisation … the total fertility rate was dropping faster than expected". (Chapter 4, p. 71)

The role of population policies extend beyond that of the NPFDB. These policies included the National Population Policy, National Policy on Women, National Policy on Reproductive Health, and the National Family Policy. These policies notwithstanding, the authors were of the view that issues related to work-life balance, public-private partnership in child care, and preparation for an ageing population needed more work. No less important than these stated gaps is the extent to which these many policies have been coordinated in their implementation.

Dimensions of the Population–Development Nexus

The relationship between population and socio-economic development is multidimensional and contextual. In the Malaysian context, with basic needs met and population growth under control, the government's imperative is to become a high-income nation and make Vision 2020 a reality. This objective has elevated education, training and the expansion of the human capital pool to among the highest priorities. The influx of migrant labour, with its impact on the economy and the country's social fabric, perceived and real, also lends an air of immediacy to the human capital dimension. The prospect of an ageing population, no less important a long-term challenge, appears to be less imminent a challenge, and is only now becoming an issue for debate. Even less urgent, given the lack of population pressure on the country's natural resources, is the dimension of environmental impact.

The above prioritisation is reflected in the contributions to this volume. Three chapters are devoted to education and training, with an additional chapter analysing the impact of foreign labour. Two chapters discuss issues related to ageing of the population, with a single chapter on the environment.

In Chapter 5, Cheong *et al.* lay out the potential benefits offered by the arrival of the demographic dividend – a growing economically active population (EAP) – but argues that these benefits will not accrue unless supported by facilitative policies. The participation of this EAP in the workforce has not only been restrained by higher enrolments in education but also by low female participation in the labour force. While the former development should be viewed positively, especially in terms of numbers enrolled, the education system itself is beset by qualitative issues that have sapped graduates' international competitiveness. Vocational education that contributed importantly to the economic upgrading in countries like Germany, Singapore and South Korea is relatively unimportant in Malaysia, and this subsector has been regarded by the public as a haven for those who cannot cut it in academic education.

It has not helped that the inadequacy of Malaysia's human capital has been masked by continued reliance on a low labour cost model, supported by unskilled foreign labour. The immediate consequences are already apparent, as Krishnan *et al.* argue in Chapter 6. The longer this model remains, the more entrenched it becomes for industry and the greater the reluctance to move up the value chain. Even as competitiveness is progressively eroded, an even more damaging long-term consequence of poor human capital endowment is institutional deterioration.

Cheong *et al.* argue that the remedies to this state of affairs are well-known, and examples for emulation in other East Asian countries are abundant. The binding constraint that needs to be overcome is political – Malaysian education has been held hostage to policies of affirmative action. Unless this link is broken, much progress is not likely to be forthcoming.

The consequences of inadequate human capital are elaborated by Krishnan *et al.* In Chapter 6, they pick up from Cheong *et al.* by laying out the consequence of human capital deficiencies. They argue that in contrast to countries that moved successfully to high income, Malaysia's economic growth among the upper middle-income countries has been driven to a significant degree by resource exports. The country's human capital deficit is also reflected in its weak innovation capabilities relative to countries classified among the upper middle-income countries. Malaysia's share of R&D scientists and engineers per million persons fell significantly short of those of South Korea, Taiwan, Singapore and even China, which has GDP per capita below Malaysia's. This deficit explains why Malaysia has not followed the growth trajectory of the above-mentioned countries to become developed.

Although viewed from the perspective of end-users of human capital rather than of its producers (Cheong *et al.*), the conclusion reached by Krishnan *et al.* are the same. This is that efforts must be made to raise the quality of human capital produced in the country, and to attract more vigorously Malaysians carrying tacit and experiential knowledge from abroad to lead critical human capital producing organisations.

A different line of attack is that of Dzulkifli, who argued in Chapter 7 that the existing mode of education planning is outmoded and at odds with Malaysia's stated education philosophy. This philosophy emphasised not only knowledge but also values, beliefs and attitudes. This is because new developments like globalisation have rendered existing planning tools obsolete. Hence maintaining relevance requires skillfully negotiating several tensions. One is between the forces of globalisation and location. Another is between elitism and equitable access. A third is between the intellectual and spiritual dimensions in the substance of education. These tensions give rise to several concerns. One is that despite universal coverage, vulnerable groups have been left behind. A second is a failure to consider, likely born of lack of understanding, education for sustainable development. He argues that dealing with these issues requires a new approach to education planning that goes beyond the traditional education planning based on numbers and age distributions, complemented by projections of labour demand in the

manner of manpower planning. This new approach must move beyond economics to embody a holistic view of human development.

Even as all the above discussions relate to developing the local population, Malaysia's history of migration especially that related to the migration from China and India up to World War Two is a vivid reminder that locals are not the only source of human capital. In Chapter 8, Narayanan and Lai document the impact of the latest group of migrants – immigrant labour – on the country's manufacturing sector. They are not the first; a study by the World Bank (2013) found that in manufacturing sectors and various service sectors immigration is related to improved productivity (World Bank, 2013: 172), and that immigrant labour generated complementary demand for local labour (World Bank, 2013: 44). By focusing on manufacturing, however, Narayanan and Lai found that while immigrants complemented local workers in the early stages characterised by labour shortage, the former displaced the latter later as employers preferred immigrants because of significant cost savings. Immigrants also impeded wage growth, while some evidence was also found that they also contributed to low productivity.

Although not discussed in this volume, the existence of a "brain drain" (World Bank, 2011) combined with the negative impact of immigrant low-skill labour speaks to the need to address this migration problem. This was the clarion call made by the New Economic Model (NEAC, 2009). However, little progress has been made to date – a World Bank report put out four years later are still making recommendations for change. Overcoming political inertia and dislodging the entrenchment of the low labour cost model among employers are the major challenges.

Less prominent but no less important is the prospect of an ageing population, the result of the rapid fertility transition as described earlier (Chapter 2).[1] This ageing requires resources, both private and government, to be shifted away from meeting the needs of the young to meeting the needs of the old. Arguing that the existing scheme for old age maintenance, the Employees Provident Fund (EPF), is inadequate to deal with this eventuality, Saidatulakmal, *et al.* seek, in Chapter 9, to estimate the financial cost of a universal social pension scheme that would ensure the aged do not fall into poverty. Their estimate is based on the 2009 Household Income/Basic Amenities Survey (HIS/BA), and they propose an eligibility-based six-dimension pension scheme. With the representativeness of the HIS/BA as an important caveat, they find that such a scheme would cost an average of 1.3% of Malaysia's GDP, a figure they feel to be reasonable. An unanswered ques-

tion here is on the revenue side. With the number of contributors falling and the number of beneficiaries rising, how could such a scheme be sustained?

A complementary study by Ng *et al.* (Chapter 10) examines the issues and challenges faced by universal health coverage as the population progressively ages. They note that the health landscape is also changing rapidly, with the rise in private health care especially in the urban areas. While entailing higher costs, private health care has also exposed quality issues in public health care. They argue that meeting future health needs requires better knowledge of vulnerable groups and sharing of this knowledge between private and public health sectors. They also call for better understanding of the social determinants of health in particular and demand-driven provision in general. With population ageing a looming phenomenon, they worry about the current lack of synergy between public and private systems and call for public debate on this issue. This debate will speak not only to the future of the country's health coverage but also to issues of equity in meeting basic needs.

The final chapter, 11, of this volume deals with population and the environment. In this chapter, Hezri, Shaharuddin and Abdul Samad, narrow their focus to a sub-region of Malaysia. There is good reason for this focus. Despite the publicity accorded universally to the impact of population on the environment, Malaysia does not face the kind of population pressure that would trigger environmental damage. To the extent such damage does occur, blame can be placed on inappropriate policies and regulatory deficiencies. The area chosen, the Bernam-Linggi Basin, shows the impact of urbanisation on the environment. Generalising, they discuss this impact on Malaysia as a whole, coming to the conclusion that "the provision of environmental goods and services by the natural ecosystems is compromised as a consequence of rapid development" (p. 210). They also highlight the direct impact of forest loss and displacement of the forest-dwelling population. Their conclusion that these problems are "within the reach of government authority to influence" (p. 219) places the responsibility on the shoulders of government, not on population dynamics.

Insights and Lessons

What insights can be gleaned from these essays? The first is the nature of the population–development nexus today. Demographically, the present and future are shaped immutably by the past. The demographic dividend in

the form of a large economically active population and low dependency is a product of rapid fertility transition, while ageing in the population's future is an inevitable outcome of rising longevity made possible by better health service delivery. Economically too, the country has forged ahead, reaching upper middle-income status and aspire to attain the mantle of high-income nation. But like in its demography, the past remains pertinent to the present. In this case, Malaysia has not progressed beyond the cheap-labour model that was the ticket to its economic advance. To make the transition requires upgrading its human capital, a target, though officially embraced, seems a major challenge. The relationship between population and development remains complex, however, and the leads and lags as well as direction of causality are not fully understood.

A second insight is the mediating role of the state in this population–development nexus. The state's role can be a response to demographic change. In this volume, the state's role in education, health and social security provision has been discussed. Also, though not directly assessed, are government attitudes and policies towards foreign labour. It can also, quite independent of demographic changes, have impacts on the economy that can be mistaken for demographic impact. This was demonstrated by the environmental impact of urbanisation and deforestation.

Third, the chapters in this volume provide assessments of this state role. Cheong *et al.* (Chapter 5) found this role in education and human capital deepening wanting. Examining the technological capability of Malaysia's workforce, Krishnan *et al.* (Chapter 6) arrived at the same conclusion. Saidatulakmal *et al.* (Chapter 9) alluded to the inadequacy of the existing institutional support for old age through the EPF. Ng *et al.* (Chapter 10) were less specific but pointed to emerging problems in universal health care if existing policies persisted. All in all, these chapters point to government responses to demographic change that leave room for improvement either by default or by design.

Beyond these, there are two further aspects of state role the chapters highlighted. One is a contested view of planning. While Tey *et al.* (Chapter 3) provide meticulously prepared projections for planning, Dzulkifli (Chapter 7) argue that the traditional approach is inadequate to cope with the many changes that have occurred, recommending instead a more holistic approach. Second, an unanswered question is the extent to which (1) stated policies are implemented, and (2) if implemented, how much coordination exist to prevent efforts made and funds expended from acting at cross purposes.

Inevitably in a volume of this kind, not all major areas can be covered. Conspicuous by its absence is housing, which is affected by demographic and economic factors, and in which the state has again an important role. Also, the focus on foreign labour has diminished somewhat the attention paid to urbanisation in particular and the spatial relocation of the local population in general. Yet as Hezri *et al.* (Chapter 11) has alluded to, urbanisation has major consequences for the environment and speaks to the future of the country's development sustainability. Also, the movement of East Malaysians to live and work in West Malaysia must surely have consequences for both areas. And even for foreign migrants, Suresh and Lai focused their analysis on legal contract labour (Chapter 8). Yet illegal migrants estimated to number as many as foreign labour must impact the economy positively and negatively. These and other major topics will undoubtedly be the subjects in other and future publications.

Note

1. The growing recognition of this issue is signaled in a conference on ageing and social security, one product of which is a special issue of the *Malaysian Journal of Economic Studies* (Volume 50, Number 2, December 2013).

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2

POPULATION AND DEVELOPMENT LINKAGES – THE EXPERIENCE OF ASIAN COUNTRIES

Gavin W. Jones

Introduction

There has been a vast literature on population and development, from the time of Malthus (and even before), to the publications of Kuznets (1967) and the United Nations Population Division (1953; 1973), and many more recent studies. There was relative consensus around the 1960s that rapid population growth caused by high fertility in poor countries was detrimental to economic and social development, but there was certainly not complete unanimity, either about whether it was detrimental at all, or about how seriously detrimental it was, compared with other factors holding back development. The "positivist" approach to the relationship between population and economic growth is exemplified by Simon, 1981. The more mainline assessment was represented by the very detailed study of the United Nations (1973) which noted that the lack of a clear-cut association between the growth of population and that of income had led several writers to conclude that population factors are not predominant as determinants of economic growth. This, however (the report argued), does not imply that population variables are not important, "but that the relations between population and economic growth are part of a whole complex of interrelations and interactions, which suggest that under different configurations of factors and conditions, the impact on economic factors may vary". For the less developed countries, the evidence suggested that rapid population growth, while it had not prevented the growth in income, "has held back the increase of levels of income and, probably, the whole

process of development in these countries to a considerable degree" (United Nations Population Division, 1973: 556).

The very cautious conclusions of the US National Academy of Sciences report in 1986 (US NRC 1986)[1] probably represented the nadir of academic consensus that rapid population growth in poorer countries was detrimental to economic development. By the end of the 1990s, accumulating evidence drawing on longer time series and more recent data on the economic performance of countries in multi-country studies gave stronger grounds for concluding that countries with higher rates of population growth have tended to experience less economic growth (Kelley and Schmidt, 2001). At the same time, the case for stressing the benefits of the age structure changes consequent on fertility decline – the so-called demographic bonus or demographic window of opportunity – was gaining prominence, being touted by many as a new development although it closely mirrored the much earlier arguments of Coale and Hoover (1958). But the economic historians like Williamson did claim to measure the positive quantitative impact of fertility decline. Williamson and Higgins argued that the high and rising saving and investment rates that fuelled the economic miracle in East Asian countries were associated with the low dependency rates resulting from rapid declines in fertility. In East Asia, the decline in youth dependency led to an impressive increase in savings and investment rates and enabled the region to kick the habit of foreign capital dependency. "Individual Northeast Asian countries' experiences retell the aggregate regional story with remarkably little deviance" (Williamson and Higgins, 2001: 146).

The intellectual arguments in the 1970s and 1980s were taking place in a situation in which national governments in Asian countries were dealing with population growth rates in the 2-3% range. For example, in Thailand, when I went there in 1968 to assist the National Economic and Social Development Board (NESDB) (then NEDB) in developing a proposal on population policy to submit to the Cabinet, the rate was thought to be 3%; such a rate would double a population in 23 years.

I made a case for policy to lower population growth, stressing things like the greater ease of raising educational enrolment ratios and of improving health when fertility declines, and of age structures more favourable to development. After submitting a draft to the Secretary General of NESDB, I was surprised when he said that the arguments are good, but that two things were ignored that the government (which then, as now, was a military government) would be worried about: (1) if the birth rate falls, will there

be enough soldiers?, (2) Is the ethnic Chinese population growing faster than the rest of the population?[2] It was easy to put those concerns to rest in a revised version of the draft. But I hadn't ever expected that they would be concerns. I learned a lot from that experience: there is a need to be politically savvy, not just intellectually sound, in making a case.

In the early 1960s, the Population Council, the International Planned Parenthood Federation and the Swedish government were giving assistance to family planning programs. But neither the United States government, the World Bank nor the United Nations family had come fully on side. This happened in the late 1960s (Seltzer, 2002). After that, there was strong international pressure to adopt policies to reduce population growth.

In Southeast Asia, Indonesia, Thailand and the Philippines all adopted policies to reduce fertility within the same year – 1970. Academic attention to the issues of population and development in the region was given a boost by the ASEAN-Australian Population Program in the late 1970s and early 1980s. An important component of this program was the project: Population and Development Dynamics and the Man/Resource Balance. A summary publication from this program – "Population and Development in ASEAN – a Status Report" (Herrin *et al.*, 1981) is well worth reviewing with the benefit of over 30 years hindsight.[3]

What did the report say? It noted the wide differences in the demo-graphic situation in the five countries covered by the report – Malaysia, Thailand, Philippines, Indonesia and Singapore. Mortality decline had proceeded well in these countries, and fertility was also declining. Though some observers attributed the fertility decline to the influence of family planning programs, the report noted that it was difficult to separate the influence of the family planning program from the effect of rapid socio-economic development in these countries. For example, in Singapore and Malaysia, the most economically developed countries of the five, "the impact of development on fertility was first manifested in changes in nuptiality patterns and later on in marital fertility. Underlying this decline in marital fertility is the changing structure of costs and benefits of children and greater use of contraception, the latter being effectively facilitated by a vigorous family planning program" (Herrin *et al.*, 1981: 15).

The report noted that patterns of fertility decline were rather different in Thailand and Indonesia. In both countries, age at marriage was not changing much (though actually it was changing more than the authors realised), and it attributed fertility decline in these countries more to the influence of the

family planning program "and perhaps to specific elements of development and social structure in these countries rather than to broad-based economic transformation and urbanization" (Herrin *et al.*, 1981: 16).

The report went on to deal with regional development, spatial distribution and employment, recognising that in all these countries, inter-regional and rural-rural migration played an important role, along with rural-urban migration. In Thailand and the Philippines, the importance of females in the rural-urban migration stream was recognised. It was also recognised that with the vanishing of the land frontier in Thailand and the Philippines, patterns of migration were likely to change, being increasingly tied to the nature and location of industrial activities.

Since that time, remarkable progress has been made in reaching or moving towards middle income country status in all these countries. Table 2.1 summarises some of the key changes. It shows that these countries have made major gains in raising income levels, expanding secondary education, and in moving from predominantly rural to predominantly urban societies.[4] Singapore is now the third wealthiest country on earth (in Purchasing Power Parity measures). Progress has been slower in the Philippines, which has fallen far behind Thailand, and even behind Indonesia, in per capita GNP, but the pace of growth has been picking up in recent years.

Since 1980 the region has also made remarkable progress in proceeding through the demographic transition – that is, in moving towards a stabili-sation of population size at low levels of fertility and mortality. In Southeast Asia as a whole, between 1980 and 2010, infant mortality rate (IMR) has fallen from 70 to 25, and total fertility rate (TFR) has fallen from 4.5 to 2.3. Malaysia has been an impressive part of this trend – IMR has fallen from 28 to 5 and TFR from 3.9 to 2.1. These trends in economic growth and demographic transition are not independent of each other. A "virtuous circle" has been in operation; as education levels rise and urbanisation takes place, the tendency for better educated, urban dwellers to be healthier and to have fewer children than their less educated, rural counterparts leads to lower mortality and fertility levels; and the lower mortality and fertility levels contribute to the faster economic growth and rise in human capital that in turn, foster further demographic transition.

However, although the trends in economic and demographic develop-ment were certainly related, it must be recognised that the relationship is not a simple one of cause and effect. The demographic and economic changes occurred in a broader context of patterns of governance and of

Table 2.1: ASEAN 5 Countries – Demographic Indicators, 1980-2010

	Population Growth Rate	Total Fertility Rate	Infant Mortality Rate	Per capita GNP*	Secondary School Enrolment Rate	Percentage Urban
Malaysia 1980	2.3	3.9	28	1820	46	42
Malaysia 2010	1.8	2.1	5	8150	67	72
Thailand 1980	2.3	3.9	54	710	28	27
Thailand 2010	0.3	1.5	12	4320	84	34
Philippines 1980	2.8	5.5	62	700	65	38
Philippines 2010	1.7	3.3	23	2060	85	49
Indonesia 1980	2.4	4.7	84	510	29	22
Indonesia 2010	1.4	2.5	29	2500	78	50
Singapore 1980	1.3	1.8	13	4920	n.a.	100
Singapore 2010	2.4	1.3	2	43980	n.a.	100

Note: * GNP is based on GNI per capita – Atlas Method (current US$) – <http://data.worldbank.org/about/country-classifications/world-bank-atlas-method>.

Sources: Population Growth Rate, Total Fertility Rate and Infant Mortality Rate – Population Division of the Department of Economic and Social Affairs of the United Nations Secretariat, <http://esa.un.org/unpd/wpp/index.htm>.
Per Capita GNP – World Development Indicators, World Bank, <http://databank.worldbank.org/data/views/reports/tableview.aspx?isshared=true>.
Secondary School Enrolment rate – Data for 1980 was gathered from World Bank, <http://data.worldbank.org/indicator/SE.SEC.ENRR/countries?page=6>.
Data for 2010 was gathered from UNESCO, <http://www.uis.unesco.org/DataCentre/Pages/country-profile.aspx?code=IDN&regioncode=40515>
Percentage of Urban Population – World Urbanization Prospects, <http://esa.un.org/unup/unup/index_panel1.html>.

economic policymaking. As argued by Mason (2001: 4), the potential benefits of reduced fertility can be realised "only if countries adopt sound development policies that encourage innovation, saving and investment, the efficient allocation of labour, rapid growth in industrial and manufacturing employment, investment in human resources, and the elimination of gender bias". Factors such as effective governance, rule of law, and lack of corruption are all important in underpinning rapid economic growth, though it is very difficult to say what factors are essential for such growth to take place. (For example, if absence of corruption was essential, few countries among the group of strong performers would be in that group.)

Fertility came down steadily everywhere in Southeast and East Asia. Figure 2.1 shows that for Southeast Asia as a whole, the TFR dropped from 6 in 1960-65 to 2.35 in 2005-2010 – barely above replacement level. Some countries still had fertility well above replacement level, but with the major exception of the Philippines, these were all small countries (Timor Leste, Lao PDR, and Cambodia). Figure 2.1 shows another important trend as well – that of the absolute number of births, which is a crucial variable for planning purposes. Interestingly, for Southeast Asia as a whole, the annual number of births has changed little since the early 1980s, and is indeed slightly lower now that it was then. For the region as a whole, this would appear to have provided a stable platform for health and education planning for an almost unchanging population of children. However, at the individual country level, which is the level at which planning actually takes place, stability in births is not so apparent. In the Philippines, annual births have climbed steadily until very recently; in Indonesia, they declined from the early 1980s, but have been increasing again over the past decade; in Thailand, annual births have declined steadily over three decades; and in Malaysia, they rose steadily until the beginning of the new millennium, but have been declining since then.

Family planning programs tended to claim responsibility for the success in lowering fertility rates, though in reality many other factors were at work. Key references on the debate over the role of family planning programs in the fertility decline are Pritchett, 1994 and Bongaarts, 1997. However, it is not worth dwelling on this debate in the present context, because the academic arguments about the benefits of fertility decline, irrespective of its causes, have now become irrelevant in East Asia and are becoming less relevant in Southeast Asia. It is primarily in the small countries – Timor Leste and Lao PDR – that fertility remains high, though it is important to

Figure 2.1: Total Fertility Rate and Number of Births (in thousands) in Various Southeast Asian Countries, 1960-2010
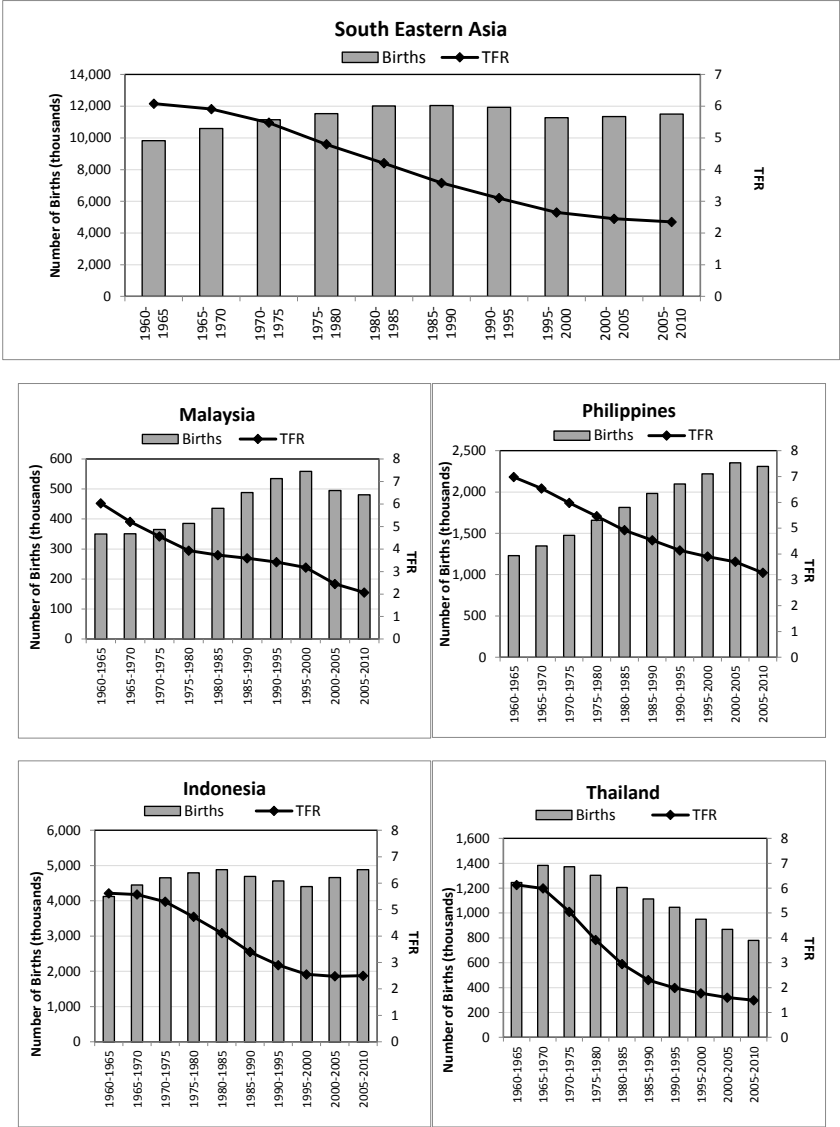
note that arguments about the benefits of fertility decline remain highly relevant in the Philippines, where fertility remains one child per woman above replacement level, and somewhat surprisingly, still relevant in Indonesia. I say "surprisingly" because earlier expectations were that by now, fertility in Indonesia would have reached replacement level, but in fact, because of a stall in fertility decline in the 2000s, fertility remains at a level almost half a child per woman above replacement level.

The age structure trends that are strongly affected by trends in fertility have been of great benefit to socio-economic development in these countries. Just to show how fundamentally their age structure has changed, Figure 2.2 shows the changes in Thailand between 1970 and 2010. The changes in both the shape of the age pyramid and in the absolute numbers are extraordinary. At every age from 15 upwards, numbers are vastly larger than they were in 1970. The most striking increases are at the elderly ages and in the mature working ages – 30 and above. At the same time, the number of children was substantially lower in 2010 than it had been in 1970. The shape, then, went from that of a pyramid to that of the bottle trees found in parts of Africa and Australia.

Figure 2.3 shows the trends in dependency ratios in selected Southeast Asian countries. Although this measure is only a crude way of showing the relationship between the dependant and the productive population, because the age markers of 15 and 65 do not clearly distinguish between those who are in the workforce or out of it, it does show the general trends. These trends have been unambiguously positive. Dependency ratios, while levelling out, are doing so at a low level. And while they are about to start rising in Singapore, Thailand and Vietnam, the rise will be modest up to 2030, though it will accelerate after that. The rise is, of course, the result of population ageing. While population ageing is generally lamented, it is wise to keep three points in mind: (1) an ageing population is actually a key sign of success in stabilising population size at low levels of mortality and fertility; such success inevitably results in population ageing; (2) for a number of decades, the low dependency ratios resulting from fertility decline provide a context facilitating economic development. Taking appropriate advantage of this "window of opportunity" should enable a strong economy to be developed, which can provide the resources for income support and health programs for the elderly during the phase of population ageing; (3) with the right mix of policies, an ageing population can be seen as a resource rather than a burden.

Figure 2.2: Thailand's Age Structure, 1970 and 2010 (numbers in millions)
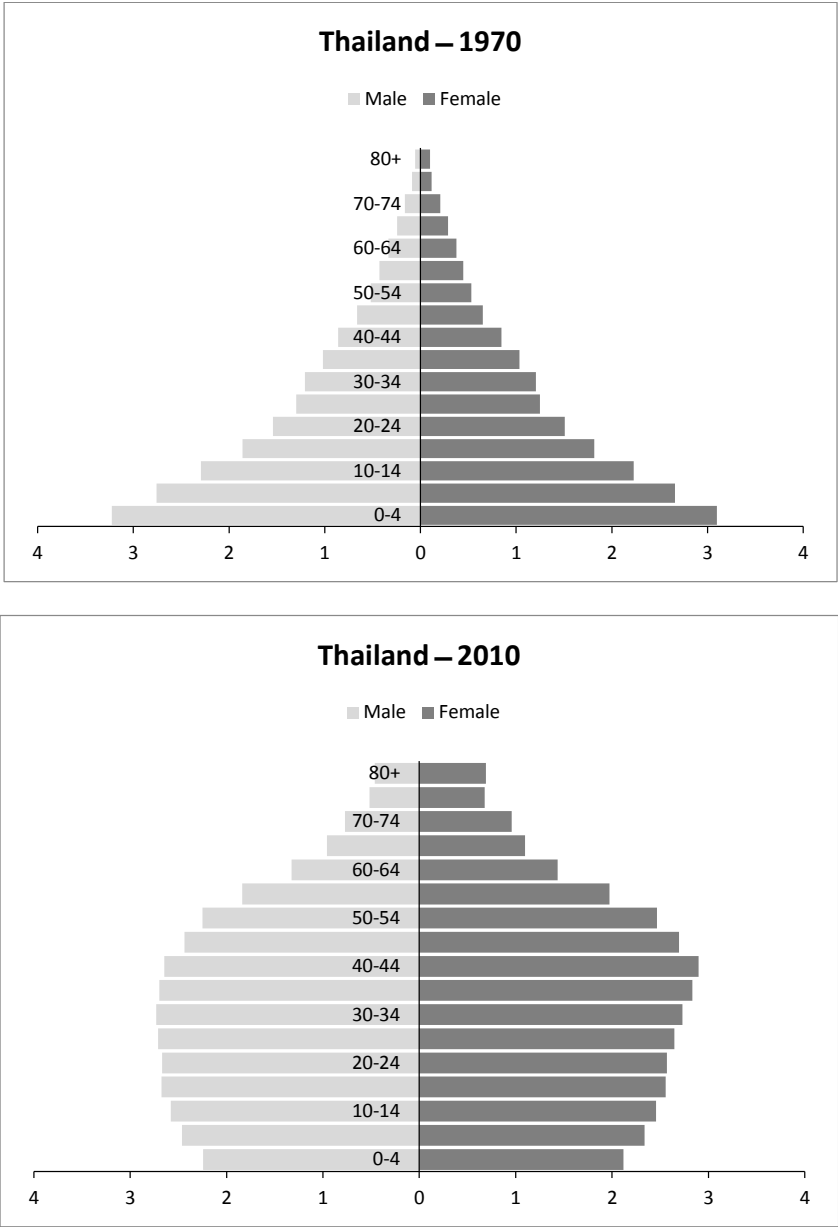
Figure 2.3: Trends in Dependency Ratios, Southeast Asian Countries, 1970-2040
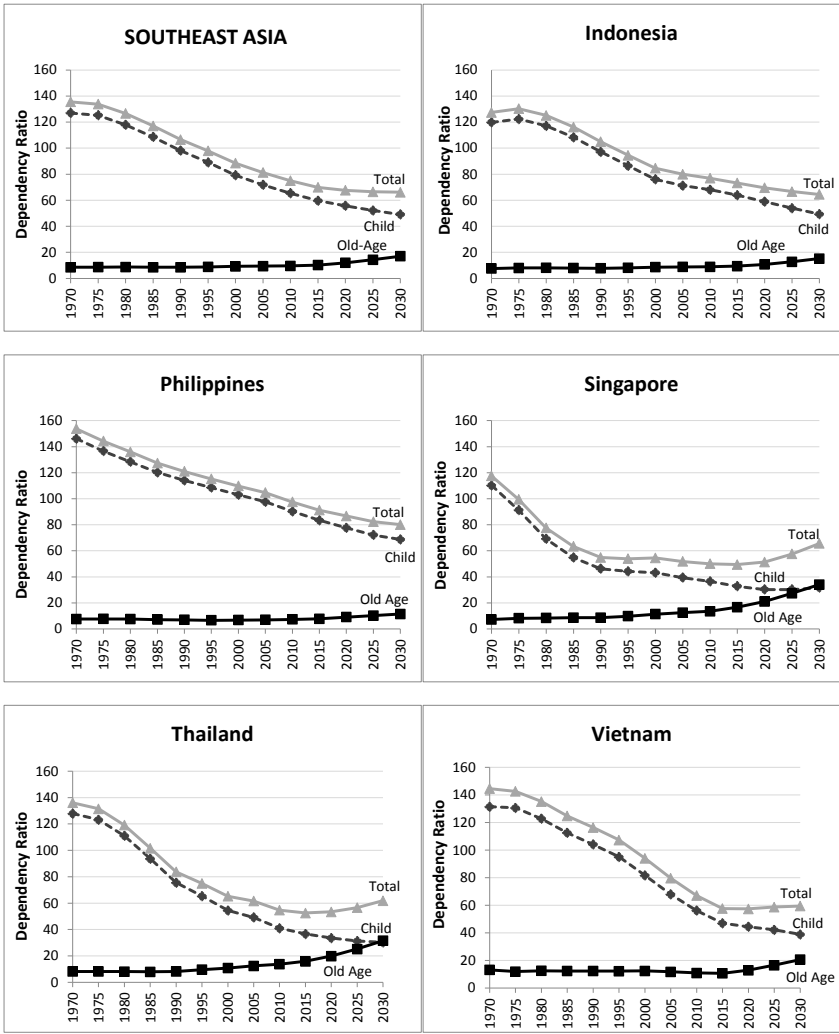
Source: United Nations Population Division, 2012, Medium Projection.

Much has been written about the demographic window of opportunity, lasting for decades, opened up by fertility decline from high levels. It cannot be stressed too much that the "opportunity" is just that – an opportunity. Not all opportunities are taken advantage of. For example, the countries of the Middle East and North Africa (the MENA countries) have not benefited

as much as hoped from fertility decline, because they have not managed to expand job opportunities rapidly enough for the still rapidly growing labour force age groups (Jones, 2012).

This issue is not irrelevant for Southeast Asian countries, either. Indonesia, for example, has done quite well in raising secondary school enrolment ratios, but less well in raising educational quality, giving rise to concerns about its international competitiveness (Suryadarma and Jones, 2013). Fertility decline takes time to influence the growth of the working-age population, and when it does, it selectively affects different segments of that population. In Southeast Asia, between 1980 and 1990, the population aged 15-29 grew by 29%, whereas the population aged 30-64 grew by 38%. Both groups were growing rapidly, because the sharp declines in fertility that had taken place were too recent to greatly affect even the younger working-age population. However, from the 1990s onwards, the growth of the two age groups began to diverge significantly, as shown in Table 2.2. By the early 2000s, the age group 30-64 was growing more than three times as rapidly as the 15-29 age group, and by the second decade of the 2000s, growth of the younger segment had almost ceased, whereas that of the older segment had barely started to slow. In analysis of labour markets, this disaggregation of the growth of the working-age population into its component age groups is very much needed if appropriate policy responses are to be found.

Figure 2.4 carries this analysis forward beyond 2010, using slightly different age groups – 15-34 for the young segment, and 35-64 for the older segment. In Southeast Asia as a whole, growth of the younger segment had, to all intents and purposes, ceased by 2010. But the growth of the older segment, while gradually slowing, will continue unabated, up to and well beyond 2030. The result is that Southeast Asia's working age population as a whole will continue to grow, adding roughly one quarter over the 20-year period 2010-2030.

Table 2.2: Southeast Asia – Percentage Growth of Younger and Older Working-age Population since 1980

	1980-85	*1990-95*	*2000-05*	*2010-15*
Aged 15-29	15.6	8.0	4.1	0.4
Aged 30-64	16.4	17.2	14.3	12.8
Aged 15-64	16.0	12.7	9.8	7.8

Figure 2.4: Index of Projected Population Growth in Different Working Age
Groups 2010-2030 – UN Medium Projections
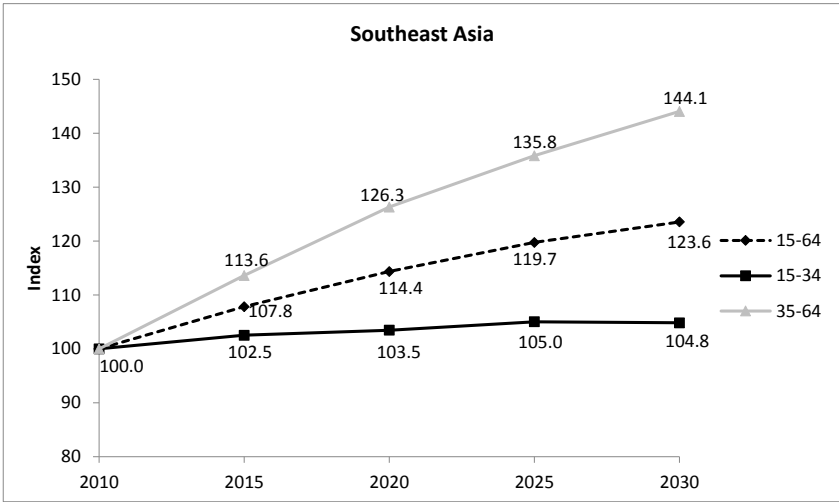
Source: United Nations Population Division, 2012, Medium Projection.

Population Policies and the Issue of Ultra-low Fertility

There are various ways of categorising policies related to population. One important distinction is between population-responsive and population-influencing policies. All countries must necessarily adopt various "population-responsive" policies; for example, educational and health planning that takes into account growing or declining numbers of potential school pupils or recipients of health services; urban plans that take into account the effect of migration on the number and age-sex structure of urban populations. There is more debate about whether "population-influencing" policies should be adopted, but as mentioned earlier, in Southeast Asia this debate was resolved in the affirmative around 1970 when three major countries in the region adopted policies to reduce fertility rates.

With the passage of time, however, the issues facing population policy in Southeast Asian countries have become increasingly diverse. Singapore has long been trying to raise its fertility rate, without much success. Thailand, faced with fertility well below replacement level, has recently taken steps in a pro-natalist direction. Fertility in Vietnam has been below replacement level for some time, and the government is at a very interesting point in

deciding on its policy with regard to fertility in its soon-to-be-announced new Population Law. Even in Lao PDR, where fertility rates remain fairly high, there is pressure in some quarters to aim to keep the rates high, on the grounds that Laos has very low population density and a larger population would be beneficial for development. On the other hand, Indonesia is concerned about the stalling of fertility decline over the past decade; its planners have no doubt that replacement level fertility should be the goal, and are trying to revive the family planning program, which has lost its direction since *otonomi daerah*.

Southeast Asia needs to take careful stock of what has happened to population in East Asian countries. Not that the two regions can be neatly separated in terms of demographic trends. Singapore and Thailand could well be included in East Asia for this purpose. Over the period of great concern about rapid population growth, the general belief of most governments in the region was that the ideal was to bring fertility down to replacement level. Not much thought was given to what might happen after that; there was somehow a belief that almost magically, fertility would level out once replacement level was reached, and UN projections, which indeed assumed that fertility levels would converge on replacement level, served to strengthen the belief.

What actually happened was that in many countries (e.g. South Korea, Taiwan, Singapore, Thailand), fertility continued right on down after reaching replacement level. This is also true for the non-bumiputera in Malaysia. But the Malaysian situation is complicated by the divergent trends for the different ethnic groups, and the maintenance over a long period of a difference of one child in the TFR between Malays (2.7 in 2010-2012), Chinese and Indians (1.6 in 2010-2012), with other bumiputera in between.[5]

In Asian countries, there were considerable delays in modifying anti-natalist policies after reaching a TFR of 2.1 (NRR of 1). This is shown to be the case for all countries included in Table 2.1. There were probably a number of reasons for this delay. The first is uncertainty for a time about whether the figures were correct. The second is that population was still growing considerably as a result of population momentum. The third was unawareness about the longer-term implications of below-replacement fertility. The fourth was a vested interest in maintaining a family planning program on the part of those whose career was in this field. This is thought to be a major reason for China to maintain its one-child policy; 800,000 jobs in the State Family Planning Commission would be lost if it were to be disbanded.

Table 2.3: Delays in Modifying Population Policy after Reaching Replacement Level

Country	Year in Which Replacement Fertility was Reached	Year in Which Anti-natalist Policy was Reversed	Number of Years Elapsed	% Below Replacement When Policy Reversed	Comments
Singapore	1975	1984	9	25	Selective pro-natalist policies for highly educated.
Singapore	1975	1987	12	25	More general pro-natalist measures.
South Korea	1984	1996	12	20	Very mildly pro-natalist policies
South Korea	1984	2004	20	50	More serious pro-natalist measures
Taiwan	1984	1992	8	20	Pro-natalist statement but no measures.
Taiwan	1984	2006	22	47	Specific pro-natalist measures under consideration
Japan	1973[1]	1990	17	25	Mildly pro-natalist measures
Japan	1973	1994	21	32	Angel plan was introduced in 1994, then revised in 1999 – More forceful pro-natalist measures.
China	1992(?)	No reversal	22(+)		25-30% below replacement in 2013; policy modified to allow only child to have 2 children after marrying.

Malaysia shows up in a very interesting light in this context. It modified its policy to eliminate the goal of reducing fertility long before replacement level fertility was reached. The policy shift appears to be vindicated by past events. Fertility gradually sank anyway – as a natural outcome of economic and social development and availability of good quality reproductive health services.

Some Key Population–Development Linkages Affecting Southeast Asia

We might briefly consider a few key elements in the relationship between population trends and socio-economic development as they affect Southeast Asian countries. I will consider the issue of population density; environmental issues; the role of education and human capital; ageing; and urbanisation and migration.

Population Density

The extensive margin of cultivation was reached at different points in different countries. The Philippines is much more densely populated overall than Thailand or Malaysia, and the extensive margin of cultivation was reached earlier (generally agreed in the 1960s). Population increase in Thailand in the 1970s and 1980s was still being accommodated through migration to more lightly populated provinces in areas bordering Myanmar and Laos. Malaysia, too, still had land available for settlement at that time. Was the closing of the land frontier in the Philippines one reason why its economy made only laborious headway in the face of rapid population growth? A case could certainly be made. But the Philippines' development problems need to be seen in a much more nuanced way than just comparing its rural population density with other countries. Its long-standing, more feudal agricultural relations are deeply involved in its problems of rural poverty.

In other circumstances, dense rural populations can lend themselves to high agricultural productivity, especially when a symbiotic relationship exists with nearby urban areas, as the historical experience of Japan, Korea and Taiwan illustrate. It would be hard to sustain an argument that a more favourable ratio of population to agricultural and mineral resources will necessarily lead to faster development. The examples of Singapore and Korea perhaps illustrate how the very absence of such resources can lead

to development successes based on the awareness of scarce resources, development of human capital and exploitation of locational advantages.

Population and Environment

The development–environment trade-off is well illustrated by the case of China. When highly skilled people are seriously considering leaving cities such as Beijing and Hong Kong because of the perceived risks pollution poses to their children's health, it is clear that the environmental costs of rapid economic growth are not inconsequential. The fact that the environmental implications of current patterns of development are finally being accorded more attention is very positive. Our concern here, though, is with how populations are affected by environmental change, and how demographic change affects the environment. Very large populations in Southeast Asia are highly vulnerable to any sea level rises (McGranahan, Balk and Anderson, 2008), which are widely anticipated as a result of climate change. Thus it is crucial that the human dimensions of climate change are taken more seriously into account (Hayes *et al.*, 2012). However, the role of population in environmental deterioration, climate change, etc. is a complex matter to study. While wealthy individuals and wealthy countries are the great polluters, a key political issue is that the bulk of population growth expected over the next 50 years will be in poor countries whose populations will understandably expect a share in the material benefits of development.

Education and Population

The relationship between education and population trends has been much written about, as a 2-way relationship. First, fertility decline assists in meeting educational goals in developing countries. Second, the education of the population is a major influence on fertility levels, since study after study has shown that fertility is negatively associated with education (but see Basu, 2010).

The speed with which educational enrolment ratios can be raised is greatly affected by demography when fertility rates are high and numbers of school-age children are expanding by some 30% each decade. This is no longer the situation in most Asian countries; indeed, school-aged population is steady or declining in many countries. However, the challenge of raising enrolment ratios remains, especially at the secondary level, where costs

Figure 2.5: Secondary School Enrolment Ratio (% gross) for China, India, Indonesia, Malaysia
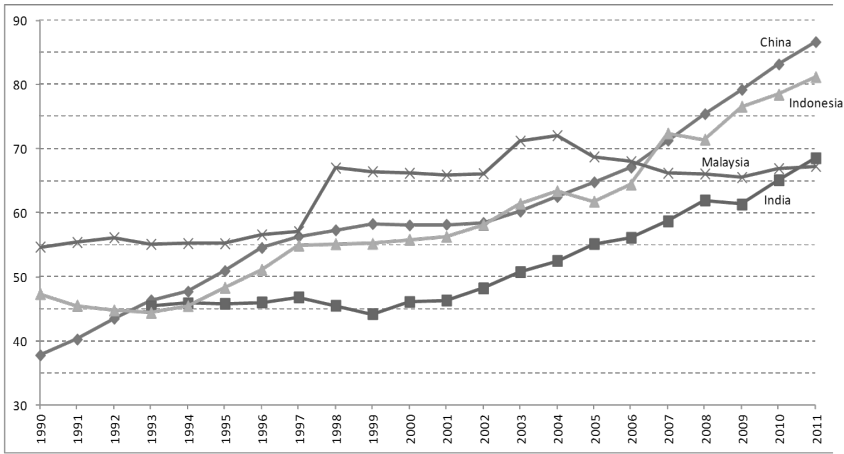
Source: World Bank database.

per student are much higher than at the primary level. Figure 2.5 shows trends in gross enrolment ratios at the secondary school level in China, India, Indonesia and Malaysia. China, India and Indonesia have all made substantial gains since 2000, but remain well behind countries such as Korea. India remains well behind the others. The trends for Malaysia are surprising; the Malaysian ratio has fallen both absolutely and in relative terms, from ahead of the other three countries in 2004 to behind them all (even India) in 2011. This is hard to believe, and suggests some problems with the data. In any case, what is important is that the educational attainment of the population takes time to modify (see Jones and Ramchand, 2013, Figure 4), and even in 2030, a substantial adult population without any education at all will remain in India, particularly among women, holding back the productivity of the Indian workforce. The timing of educational expansion is crucial, since any delay consigns children who will still be in the workforce half a century from now to a future of low productivity and low income.

Ageing

Ageing will be high on the priority list of social policy issues for all Southeast Asian countries over the next two decades. While ageing

Table 2.4: Trends in Percentage of Population Aged 65+

	1990	*2000*	*2010*	*2020*	*2030*
Singapore	5.6	7.3	9.0	13.9	20.5
Thailand	4.5	6.6	8.9	13.0	19.5
Vietnam	5.7	6.4	6.5	8.2	12.9
Malaysia	3.6	3.8	4.8	6.9	9.7
Indonesia	3.8	4.7	5.0	6.3	9.2
Philippines	3.1	3.2	3.7	4.9	6.3
SE ASIA	4.1	4.9	5.5	7.1	10.3

Source: United Nations Population Division 2012.

proportions will remain well below those in Japan and Korea, the proportion aged 65 and over is expected to increase over the next two decades as shown in Table 2.4. The increases are quite startling – from 8.9% to 19.5% in Thailand, from 4.8% to 9.7% in Malaysia. Such figures are often viewed with alarm, especially with regard to the ability of families to continue as the first line of support for their elderly, and the ability of the state to devise adequate income maintenance policies, once a contracting labour force is supporting a rapidly expanding pool of elderly. It is wise to keep in mind that even in 2030, the proportion of elderly population in Thailand and Singapore will still be well below its current level in Japan, and much lower still in Malaysia. Also, policies to extend retirement ages according to different ways of viewing ageing could lessen the extent of the crisis (Sanderson and Scherbov, 2005; 2010).

Urbanisation and Migration

In the new demographic situation facing Southeast Asia, migration will inevitably play an even greater role than in the past. A similar point has been made about China, where the population of provinces with ultra-low fertility, such as Shanghai and Guangzhou, has nevertheless been growing much more rapidly than that of provinces with higher fertility, such as Sichuan, Guizhou and Hubei. As noted by Gu (2014: 2), by the end of the demographic transition, "both mortality and fertility are at low levels and become less influential, and population migration tends to come to the fore to play a pivotal role in determining the population situation. All in all, it

Table 2.5: Trends in Percentage of Malaysia's Population –
Selangor and Perak

Year	Selangor	Perak
1970	9.4	15.0
1980	10.9	13.3
1990	13.1	10.7
2000	18.0	8.8
2010	19.3	8.3

is clear that China has entered a period in which demographic dynamics becomes dominated by migration rather than mortality or fertility".

Just as in China, migration looms large in Malaysia these days as an influence of population trends. This can be illustrated by comparing the changes in the relative populations of the different states. Trends in the shares of Selangor and Perak in Malaysia's total population are shown in Table 2.5.

Selangor's share has doubled over this 40-year period; Perak's has nearly halved. This is a remarkable turnaround in the situation of the two states, and has almost nothing to do with fertility or mortality. Rather, it has to do with the collapse of the tin mining industry in Perak, leading to a steady outflow of migrants, and to the overflow of Kuala Lumpur's population into neighbouring Selangor state, which has drawn migrants not only from Kuala Lumpur's suburbanisation process, but from all parts of Malaysia, drawn to the Klang Valley mega-urban region.

Migration's role is not just in altering the relative population of different regions, but also in strongly influencing labour force dynamics, population ageing and the gender balance of the population. For example, in China, the concern about ageing has usually focused on the urban population, because fertility rates are higher in rural areas. However, the reality is that with the exodus of so many young people from the rural areas, the thousand-year mechanism of old-age support by the next generation is breaking down in rural areas, posing enormous difficulties for social security policy.

Geographical differences in ageing in Malaysia show a somewhat similar pattern to those in China. Despite their lower fertility rates, the cities have lower proportions of elderly, because of high levels of in-migration of young people. Thus the proportion of population aged over 65 is 4.6% in KL and 3.5% in Selangor, compared with 7.7% in Perak.

The Role of the United Nations in Population Policy Leadership

The role of the International Population Conferences held by the United Nations has been very important in keeping population issues in the spotlight. These of course are highly political conferences.[6] The Cairo ICPD in 1994 led to a major shift in approaches to population policy. The new agenda, stressing reproductive health and reproductive rights, was appropriate for the countries of Southeast Asia, though its result of diverting attention from the goal of reducing population growth rates, and a slackening of international interest in funding family planning/reproductive health programs, may not have been the best outcome for Africa, where fertility rates remained very high and mortality in some countries rose as a result of HIV/AIDS. As argued by Gillespie, 2004 and Cleland *et al.*, 2006, the international community had moved away from family planning at a time when too much unfinished business remained. The high level of success in publicising the issues of HIV/AIDS led to too much of the limited resources going to HIV/AIDS, and too little to reproductive health.

Recently, the private sector has been showing the lead in re-igniting support for family planning and reproductive health – in particular, in the form of the Bill and Melinda Gates Foundation. In July 2012, a summit on family planning was held in London, called by the British Government and the Gates Foundation, at which promises of US$4.6 billion were secured from donors to meet unmet need for family planning.

Meanwhile, the United Nations continues to press for an agenda flowing from the Programme of Action of the ICPD. A recent document proposing follow-up actions beyond 2014 (United Nations 2014), acknowledges the increasingly inequitable distribution of the fruits of economic development, and emphasises that the framework for population and development beyond 2014 should rest on five thematic pillars: dignity and human rights, health, place and mobility, governance and accountability, and sustainability. It argues that "because the respect, protection, promotion and fulfilment of human rights are *necessary preconditions* for realising all of the unfulfilled objectives of the Programme of Action, the elaboration and fulfilment of human rights are a critical metric for determining whether, for whom, and to what extent, aspirations have been achieved". It can be hoped that a human rights emphasis will help in moving forward in controversial areas such as adolescent reproductive health, access to abortion, issues of gender-based violence, and improving the conditions of migrants, especially undocumented migrants.

Conclusion

Taking the world as a whole, economic growth is continuing (albeit with unfortunate distributional trends and worrisome environmental impacts) and the demographic situation is increasingly under control. However, people live in particular countries and particular locations within those countries, and what is happening in the world as a whole may not be of much interest to them. In many parts of Africa and South Asia, the population and development situation remains problematic. Maternal mortality rates, for example, remain very high in many of these countries, and MDG goals will not be met; yet at the same time, they face complex issues resulting from excessively high population growth. If we focus on unemployment among young adults, the situation in many countries across the world is not good.

By contrast, in Southeast Asia, on the whole, there is much more reason for optimism. Things have changed dramatically in the course of one person's working life. Between the time I worked in Thailand in 1966-69 and the time I returned to be involved in the preparation of the report *Impact of Demographic Change in Thailand* (Jones and Im-Em (eds), 2011), Thailand had proceeded through the demographic transition, from high to below-replacement fertility, and had moved from being a poor country into the ranks of middle-income countries. Likewise, Malaysia's demographic and economic situation has changed remarkably between the time I was there for PhD fieldwork in 1964 and today. But there is great diversity within Southeast Asia. Malaysia and Thailand are comparatively wealthy, and it can be argued that the issue of whether they will avoid the middle-income trap (see Hill, Tham and Ragayah (eds), 2011) is less important than the issue of whether Indonesia, the Philippines and Vietnam will be able to establish themselves firmly within the middle-income country camp.

Demographic factors remain very important in the overall development equation, but the meaning of development remains contested, the increasing inequality in many countries' income distribution provides a fundamental challenge to current economic systems, and the sustainability of what we have achieved remains in question. The United Nations has issued a challenge to academics and planners by claiming that the framework for population and development beyond 2014 should rest on the five thematic pillars of dignity and human rights, health, place and mobility, governance and accountability, and sustainability. Integrating the specifics of population

policy into overall development policy under these five broad themes will require both good analytical abilities and a much broader vision of the goals than most development planning entails.

Notes

1. The report stated: "On balance, we reach the qualitative conclusion that slower population growth would be beneficial for economic development for most developing countries. A rigorous quantitative assessment of these benefits is difficult and context-dependent".
2. The latter issue used to be constantly raised in Indonesia as well, and in a different form in Sri Lanka – are Tamils growing faster than Sinhalese?
3. A more detailed study on Malaysia alone was prepared by Lim, 1983.
4. The recorded level of urbanisation in Thailand in 2010 is unrealistically low, as a result of a conservative procedure for awarding urban status to localities in Thailand – see Jones, 2004.
5. The figures given are 3-year averages for the years 2010-2012, in order to smooth out year-to-year fluctuations.
6. On the politics of earlier UN Population Conferences, see Jones, 1977; Finkle and Crane, 1975; 1985.

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3

POPULATION PROJECTION FOR DEVELOPMENT PLANNING IN MALAYSIA

Tey Nai Peng, Ng Sor Tho and Tan Pei Pei

Abstract

The primary objective of development is to satisfy the basic needs of the population. For effective planning, there is a need to have a good knowledge of the size and characteristics of the target population. Hence, population projections are essential for development and business planning. The accuracy of population projection depends on the quality of data on the current population, and how accurately one can predict the demographic processes. We provide population projection up to year 2040, based on the most likely demographic scenarios bearing in mind the socio-economic changes. The population projection is then used to estimate the requirements for education, health and economic sectors up to 2020, covering the 11th Malaysia Plan period. These projections at the national level are meant to be illustrative as there is a need to have more detailed breakdown for the various sub-groups and regions in the country. Functional population projections must be updated from time to time to take into account the changing socio-economic conditions of the country.

Introduction

Demographic factors affect and are affected by socio-economic development. Many studies using demographic–economic models have been carried out to examine the population–development linkages (Lim, 1983; UNESCO, 1991; McNicoll, 2003; Satia, Zaman and Lim 2009; UN, 1994; 2013). At the 1994

International Conference on Population and Development (ICPD) held in Cairo, the governments of nearly all countries, including Malaysia, endorsed a 20-year Programme of Action (PoA) for the integration of population factors in socio-economic development planning. The new strategy of the PoA focused on meeting the needs of individual women and men rather than on achieving demographic targets aimed at controlling population growth in developing countries (United Nations, 1994).

Population variables such as age–sex composition, fertility, mortality, migration and population distribution are inter-related with socio-economic development (Lim, 1983; Simmons, 1984). A good knowledge of the population–development linkages is essential for making population projections which can be used for formulating development policies and in the provision of social services and amenities, as well as business planning.

Past Malaysia Plans have taken into account population factors such as population growth, fertility and mortality rates, projection of future population size, estimated and projected school going age and working age population, labour force, household formation, dependency ratio, working life expectancy, population distribution and urbanisation. The 5-year development plans also recognised the problems caused by rapid population growth such as pressure on educational facilities, housing, social services, dependency ratio, urban areas, labour shortage and environmental impact of rapid population growth (Lim, 1983).

The Use of Population Projections

Population projections are used for different purposes (Tharakan and Navaneetham, 1999; Gora, undated; Abel, 1999; UN, 2003). Knowledge of future population and its characteristics is vital for development and business planning. Government planners are concerned with meeting the demand for education and health, adequate infrastructure and amenities such as housing and water supply, and to create sufficient jobs to meet the demand of an increasing population. The changing age structure and population ageing have important implications for marketing and employment planning.

Population projection can also be used to determine the time frame to achieve a target population size. In 1984, when the Government announced a new population policy to achieve an ultimate population of 70 million (GOM, 1984), alternative sets of population projections were provided to

the government for consideration. Taking cognizance of the implications of rapid population growth to achieve the target within a short time, the policy was cast in a very long-term framework of 115 years, i.e. to achieve a population of 70 million by 2100 by decelerating the rate of fertility decline.

The purpose of this chapter is to identify the data needs, and provide projected population figures, disaggregated by age and other characteristics, which may be used by planners from the government and the industry for planning purposes. Specifically, the chapter seeks to illustrate the requirements for education, health and economic sectors in terms of human resources, infrastructure and expenditure to meet the needs of the population.

An Overview of the Demographic Scenario in Malaysia

Consequent upon the continuing decline in fertility, the rate of population growth began to decelerate to 2.0% per annum during the first decade at the turn of the new millennium, from around 2.5-2.7% in the preceding 4-5 decades. According to the population clock maintained by the Department of Statistics, the population of Malaysia hit 30 million on 26 February 2014 (http://www.statistics.gov.my/portal/index.php?lang=en). This represents an increase of 1,665,865 persons (or 455,120 persons per year) over the enumerated mid-year population of 28,334,135 in 2010, at an annualised rate of growth of 1.56%, a rather sharp decrease from the 2% growth in the previous decade (DOSM, 2011).

Future population growth will depend on the levels of fertility, mortality and migration. A better understanding of the trends and factors that affect population is essential to provide a basis for making the projection. Hence, we begin by examining the trends and factors affecting changes in the demographic processes.

Many studies have found that the fertility level is strongly and negatively associated with rising education, urbanisation, increased female participation in the modern sector, rising cost of living and child care, the breakdown of extended family system as well as reduction in infant mortality rate (Chander *et al.*, 1977; Hamid Arshat *et al.*, 1988; Shi, 1990; Choe and Retherford, 2009; Perelli-Harris *et al.*, 2010). Hence, rapid socio-economic development in Malaysia has resulted in continuing fertility decline, to replacement level (total fertility rate of 2.1) in 2012, from a relatively high level of 3.8 children per woman in 1980. There has been

Figure 3.1: Trend in Total Fertility Rate (Number of Children Born per Woman) by Ethnic Group
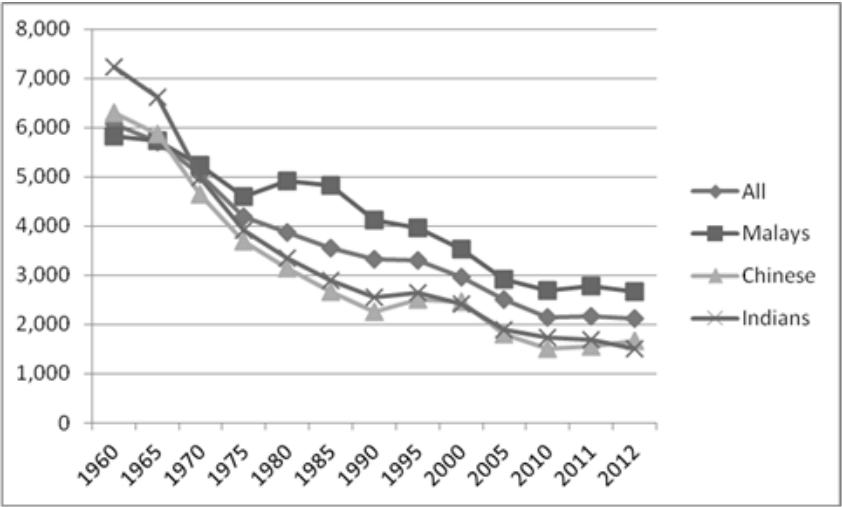

Source: Department of Statistics, Malaysia – *Vital Statistics*, various years.

a long-term trend towards delayed and non-marriage; and abortion is probably on the rise in light of the falling fertility despite the stalling of contraceptive prevalence rate at around 50% since the mid-1980s (Tey, Ng and Yew, 2012). The pace of fertility decline has been more gradual among the Malays (with a TFR of 2.7 in 2012) than that of the Chinese and Indians (at 1.7 and 1.5 respectively) (Figure 3.1).

Ethnic fertility differentials are mainly due to the younger age at marriage and lesser use of contraception among the Malays as compared to the non-Malay. Applying Bongaart's model for estimating the fertility inhibiting effects of the proximate determinants, Tey, Ng and Yew (2012) estimated the index for marriage at 0.45 for Malays, 0.32 for Chinese and 0.4 for Indians, and the index for contraception at 0.62, 0.38 and 0.5 respectively for each group, with the lower value indicating greater effect. The scope for further decline for the Chinese and Indians is rather limited and there may be a possibility of stagnation or reversal of the trend in the near future. As for the Malays and other bumiputera, the declining trend may also decelerate or come to a halt, but the possibility of a significant rise in fertility is rather unlikely given the rising cost of living.

Figure 3.2: Number of Children Ever Born to Women Aged 40-49 Years by Place of Residence and Education
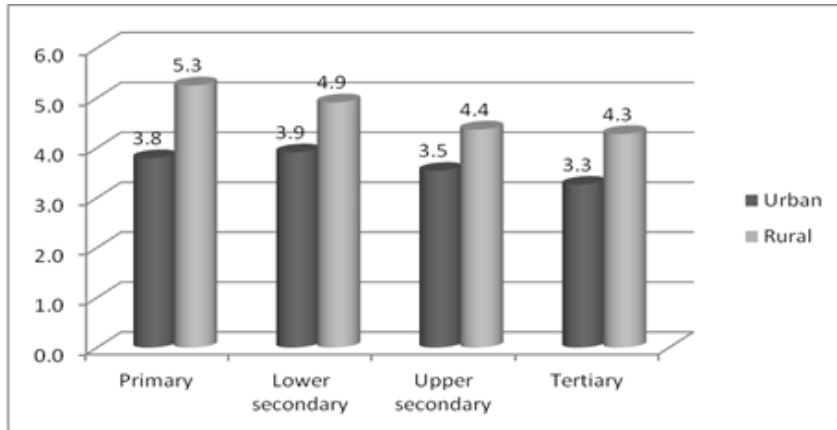
Source: Computed from the 2004 Malaysian Population and Family Survey data.

Data from the 2004 Malaysian Population and Family Survey show that women living in urban areas and having higher education have significantly smaller completed family size as compared to those living in rural areas and with low education (Figure 3.2). Hence, low fertility is to be expected as Malaysia is becoming more urbanised, and female enrolment in tertiary education has been increasing very rapidly, especially since the passage of the Private Higher Educational Institutions Act in 1996. The proportion of workers with tertiary education jumped from 9% in 1998 to 16% in 2007 and 24.3% in 2012 (20% for males and 31.6% for females) (DOSM, 2013).

The lower fertility of the Chinese and Indians as compared to that of the Malays and other bumiputera has resulted in significant changes in the ethnic composition of the population. In 2000, Bumputera made up 65.1% of the citizen population, Chinese 26.0%, Indians 7.7% and others 1.2%, but the proportionate share of the bumiputera increased to 67.4% in 2010, with a corresponding decrease of the Chinese, Indians and others to 24.6%, 7.3% and 0.7% respectively (DOSM, 2011). The changes in the ethnic composition will have an effect on the future course of fertility decline as the higher fertility level of the Malays will likely prevent the overall rate to sink well below the replacement level.

The mortality level of Malaysia has fallen to a low level, due to rising standards of living and an excellent healthcare system. The crude death

rate has fallen from about 9 per thousand population in 1963 to below 5 since the mid-1980s, and infant mortality rate has also fallen from 56.7 per thousand births in 1963 to 6.3 in 2012. Life expectancy for the males and females is now at 72.6 and 77.2 years respectively. At this level, any increase in life expectancy will be much more gradual. With age structural shift and population ageing, the crude death rate will be rising, as in the case of countries that have completed the demographic transition. With low fertility and increasing crude death rate, the rate of population growth is likely to decline further, barring significant inflows of migrants.

With the cessation of large scale immigration after the Second World War, natural increase became the main determinant of population growth. However, since 1980s, there has been a new wave of migrant workers from the neighbouring countries and other parts of the world, in response to globalisation and the tight labour market. The 2010 population census enumerated 2,320,779 non-Malaysians, making up about 8.2% of the total population, as compared to 1.4 million or 5.5% in 2000 (DOSM, 2011). The rate of population growth of 1.56% per annum since 2010 is higher than the crude rate of natural increase, at about 12.7 per thousand population for the period 2010-2012. This implies that the inflow of migrant workers has continued to contribute to population growth. With the creation of more jobs in the development corridors and the persistence of labour shortage, the inflow of migrants is expected to continue unabated.

Declines in mortality and fertility have brought about changes in the age structure of the population, which has an effect on the labour market, childbearing (as more women are entering the childbearing age) and demand for services such as education. Between 2000 and 2010, the median age of the population rose from 23.6 years to 26.2 years. The proportion aged below 15 continued to decrease from 33.3% in 2000 to 27.6% in 2010, while those aged 65 and above increased from 3.9% to 5.1%, and the proportion in the working age group aged 15-64 increased from 62.8% to 67.3% (DOSM, 2011).

Data and Methods

There are two main methods for population projections. The mathematical method using the exponential rate of growth (where $P_t = P_0 e^{rt}$) is used to project the population of small geographical areas for a short time frame, usually up to 10 years. The cohort component methods are used to project

national populations based on assumptions relating to fertility, mortality and migration.

This chapter used the Spectrum, a computer program designed (by the Futures Group) to produce useful information for policy formulation. DemProj, a sub-program under the Spectrum system was used to make population projections and the outputs were then incorporated into RAPID, another sub-program, to project educational, health and new jobs requirements (Abel, 1999; Stover and Kirmeyer, 2005).

In this chapter, the projections were made for the period 2011-2040. The input data required for population projection included the base year population by age and sex from the 2010 population census, the assumed future trends in total fertility rate and age specific childbearing pattern, sex ratio at birth, life expectancy by sex, a model life table (incorporated in DemProj), number of immigrants by age and sex. The number of net immigrants and their age distribution were taken from the default projection in DemProj. Table 3.1 presents the assumed TFR, life expectancy and number of immigrants. The age distribution of migrants is given in Appendix 3.1.

The case for making the assumption of below replacement level fertility is reinforced by the experience of other countries. Many developed countries have below replacement fertility, and a few have managed to stay at around replacement level. A number of East and Southeast Asian countries have experienced below replacement fertility for quite some time, and governments' efforts to prop up fertility level have proven futile. A few

Table 3.1: Actual and Assumed Fertility Rate, Life Expectancy and Net Immigration, 2010-2040

	2010	*2015*	*2020*	*2025*	*2030*	*2035*	*2040*
TFR	2.13	2.11	2.07	2.0	1.94	1.87	1.8
Male life expectancy	71.7	72.7	73.6	74.4	75.1	75.9	76.6
Female life expectancy	76.2	76.7	77.3	77.9	78.6	79.3	80.0
Immigration							
Male	8,657	8,657	8,657	8,657	8,657	8,657	8,657
Female	8,242	8,242	8,242	8,242	8,242	8,242	8,242
Total	16,899	16,899	16,899	16,899	16,899	16,899	16,899

Muslim countries such as Iran, Bangladesh and Indonesia have also attained below replacement or near replacement level fertility.

The age specific childbearing pattern and sex ratio at birth for 2011 (DOSM, 2012a), and the Coale-Demeny West Model were assumed for the projection period. The proportion of urban population was assumed to increase from 70.4% in 2010 to 75% in 2020, 80% in 2030 and 85% in 2040. These figures correspond closely with the assumption by the United Nations in projecting the growth of urban population for Malaysia.

Table 3.2 presents the input data for projecting the human resources, facilities, expenditure, new jobs creation and economic performance for three selected sectors – education, health and economy. These indicators for the base year are taken from the social statistics bulletin published by the Department of Statistics (DOSM, 2012b). While some of these indicators will remain (more or less) constant, others are assumed to change, in tandem with the desired improvement in the standards, such as an improvement in secondary school enrolment ratio, student teacher ratio, doctor population ratio, nurse population ratio, hospital bed population ratio. Per capita expenditure for education and health care are assumed to increase to take into account the rising cost.

The outputs from the population projections were used to estimate the requirements for human resources in three sectors that are directly related to population growth, i.e. education, health and the economy. Beyond population numbers, planners will have to set a standard based on past performance and/or in comparison with the standard achieved by the more developed countries, subject to availability of resources. The enrolment ratio for primary school is about 96% and the target of universal education is achievable.

Population Projection for the Period 2010-2040

The population of Malaysia (inclusive of non-citizens) is projected to increase from about 28.6 million in 2010 to 30.5 million in 2015, 32.6 million in 2020, 36.1 million in 2030 and 38.4 million in 2040.

While the fertility has already reached replacement level in 2010, the population will continue to grow, albeit at a reduced rate, on account of the growth momentum. The rate of population growth was projected to fall from about 1.3% per annum in 2015 to 1.2% in 2020, 0.8% in 2030 and 0.5% in 2040 (Table 3.3 and Figure 3.3).

Table 3.2: Current and Assumed Indicators for Projecting the Requirements for
Education, Health and Economic Sectors

Indicators	Year						
	2010	2015	2020	2025	2030	2035	2040
Education							
Age of entry into primary school	7						
Number of years of primary schooling	6						
Primary school enrolment rate (%)	96	100	100	100	100	100	100
Students per primary school teacher	12	12	11	11	11	11	11
Students per primary school	360	360	360	360	360	360	360
Recurrent expenditure per primary school student (RM)	4,033	4,360	4,688	5,016	5,344	5,672	6,000
Age of entry into secondary school	13						
Number of years of secondary schooling	7						
Secondary school enrolment rate (%)	80	81.7	83.3	85.0	86.7	88.3	90
Students per secondary school teacher	13	12	12	11	11	10	10
Students per secondary school	1,000	1,000	1,000	1,000	1,000	1,000	1,000
Recurrent expenditure per secondary school student (RM)	4,321	4,934	5,547	6,160	6,773	7,386	8,000
Health							
Population per doctor	867	734	687	640	594	547	500
Population per nurse	414	403	393	382	371	361	350
Population per health centre/clinic	3,800	3,600	3,380	3,160	2,940	2,720	2,500
Population per hospital	75,257	71,047	66,838	62,628	58,419	54,209	50,000
Population per hospital bed	611	559	507	456	404	352	300
Annual health expenditure per person (RM)	1,200	1,500	1,800	2,100	2,400	2,700	3,000
Economy							
Male labour force participation rate	80.5	80.5	80.5	80.5	80.5	80.5	80.5
Female labour force participation rate	49.5	51.25	53	54.75	56.5	58.25	60.0
Base year gross domestic product (GDP millions) (Ringgit)	1,000,000						
Annual growth rate in GDP (%)	4.9	4.92	4.93	4.95	4.97	4.98	5.0

Table 3.3: Summary Statistics of Projected Population, 2010–2040

	2010	2015	2020	2025	2030	2035	2040
Crude birth rate	17.3	17.6	17.1	15.7	14.2	12.9	12
Crude death rate	5.1	5.0	5.3	5.7	6.3	7.0	7.7
Crude rate of natural increase	1.22	1.26	1.18	1	0.79	0.59	0.43
Annual growth rate	1.27	1.32	1.23	1.05	0.83	0.63	0.47
Annual births	493,585	538,334	557,657	541,315	512,131	481,033	460,505
Annual deaths	145,997	153,302	172,882	196,725	227,710	260,550	295,141
Total population	28,588,800	30,530,627	32,561,308	34,461,001	36,090,962	37,403,672	38,419,471
Male population	14,730,800	15,692,370	16,700,055	17,639,103	18,438,741	19,074,821	19,557,644
Female population	13,858,000	14,838,257	15,861,253	16,821,897	17,652,220	18,328,851	18,861,827
Percent 0-4	8.77	8.38	8.39	7.88	7.19	6.53	6.05
Percent 5-14	18.59	16.91	15.53	15.33	15.08	14.19	13.11
Percent 15-24	20.11	18.03	16.37	15.04	14.08	14.19	14.24
Percent 15-49	56.25	56.04	55.23	53.84	52.52	50.63	48.9
Percent 15-64	67.65	68.9	69.21	68.56	68.06	68.22	68.47
Percent 65+	4.98	5.82	6.87	8.23	9.67	11.05	12.37
Percent females 15-49	55.71	55.56	54.65	53.27	52.15	50.46	48.71
Sex ratio	106.3	105.76	105.29	104.86	104.46	104.07	103.69
Dependency ratio	0.48	0.45	0.44	0.46	0.47	0.47	0.46
Median age	26	28	31	32	34	36	37
Urban population	20,125,200	22,134,704	24,420,981	26,707,276	28,872,769	30,858,030	32,656,550
Rural population	8,463,600	8,395,922	8,140,327	7,753,725	7,218,192	6,545,643	5,762,921
Percent urban	70.4	72.5	75	77.5	80	82.5	85
Percent rural	29.6	27.5	25	22.5	20	17.5	15

Figure 3.3: Projected Population and Rate of Growth
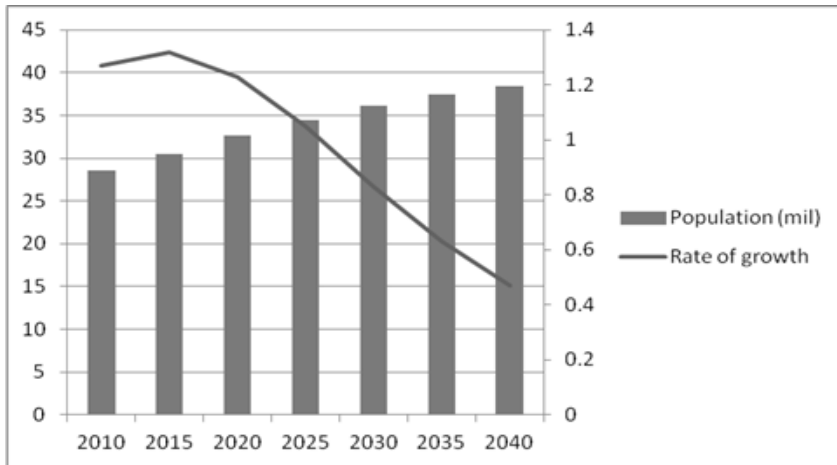
On the one hand, the number of births is projected to increase from about 494 thousand in 2010 to 558 thousand in 2020 before decreasing to 461 thousand in 2040. On the other hand, the number of deaths is projected to increase from about 146 thousand in 2010 to 173 thousand in 2020, and 295 thousand in 2040. The decreasing number of births will result in a decline in the crude birth rate from 17.3 per thousand population in 2010 to 12 per thousand population in 2040. Due to the ageing of population, the crude death rate is projected to increase from 5.1 to 7.6 per thousand population. The net result is a decline in the crude rate of natural increase from 1.2 % to 0.43%. Part of the population growth will result from net gain in international migration.

Table 3.4 provides a comparison of the population projection with those made by the Department of Statistics and the Population Division of the United Nations. Our projection, which takes into account the latest figures for the total fertility rate and age specific fertility rates (for 2012) and life expectancy for 2010, corresponds very closely with the projections made by the Department of Statistics (DOSM, 2012c). While our figures also correspond rather closely with those of the projected figures by the United Nations in the short run, the two sets of projected figures deviate rather significantly after 2025. However, the UN has been revising the earlier projections downwards to take into account the much faster than expected decline in fertility. In the long run, the UN projected the population to peak at 44.2 million in 2070.

Table 3.4: Population Projections as Compared to the Projections Made by
DOSM and UN, 2010-2040

	Authors' Own Projection	*DOSM*	*United Nations (medium variant)*
2010	28.6	28.6	28.3
2015	30.5	30.5	30.7
2020	32.6	32.4	32.9
2025	34.5	34.3	35.0
2030	36.1	36.0	36.8
2035	37.4	37.4	38.5
2040	38.4	38.6	39.9

Sources: DOSM, 2012c; UN, 2012.

Figure 3.4: Percentage Distribution of Population by Broad Age Groups,
2010-2040
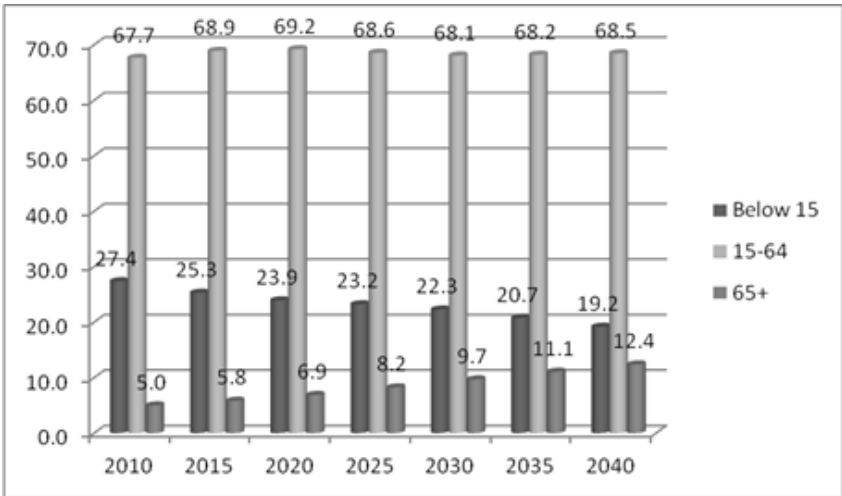
The age structure of the population will be changing with the median age rising steadily from 26 years in 2010 to 37 years in 2040. The proportion in the younger age groups will be decreasing, as shown in Table 3.3. On the other hand, population aged 65 and over will be increasing rapidly in number and proportion. The working age population (15-64) will remain at around 68-69%, throughout the projection period (2010-2040), giving rise to what is known as the demographic dividend, as the dependency ratio will remain at around 44-48%. However, there will be a shift in the component of

dependency as youth dependency will decline from 0.40 in 2010 to 0.28 in 2040, while old age dependency ratio will increase from 0.07 to 0.18 during the same period.

The changes in the age-sex structure can also be viewed from the population pyramid (Figure 3.5). The population pyramid on the left shows that fertility rate has been falling for some time, as the number in the younger age groups (0-14) is less than those aged 20-29. By 2040, the population pyramid shows a large number and proportion aged 40s and 50s who will be entering the elderly group in the next 10-20 years.

The urban population is projected to grow rapidly from 20 million in 2010 to 32.6 million in 2040, while the rural population will be decreasing from 8.5 million to 5.8 million during the same period. The urbanisation level is projected to increase from 70.4% to 85%.

A more detailed breakdown of the age of the population is needed for educational planning, provision of services for birth delivery and immunisation and creating jobs for new entrants to the labour market. The population by single age up to age 23 is given in Appendix 3.2 for such purposes.

Estimating the Requirements for Human Resources, Facilities and New Job Creation for Education, Health and Economic Sectors, 2010-2020

Requirements for Education

Table 3.5 provides a summary of the requirements for the educational sector up until 2020. With universal primary education, all primary school going age population will be in school. The number of primary school students has increased only slightly from 3.026 million in 2000 (as reported by the World Bank) to 3.055 million in 2010, as a result of declining fertility. The number of primary school students is projected to fluctuate around 3 million and 3.1 million during the 2010-2020 period. Maintaining the student-teacher ratio at around 11 would require a total of between 255 thousand and 273 thousand primary school teachers, and the number of primary schools required is projected to decrease from about 8677 in 2012 to about 8350 in 2020. However, it must be noted that with urbanisation, the concentration of students in large urban centres would have to be taken into account as some urban schools may not have the capacity to take in the increasing number of students while some rural schools may have to be closed down due to the dwindling number of students.
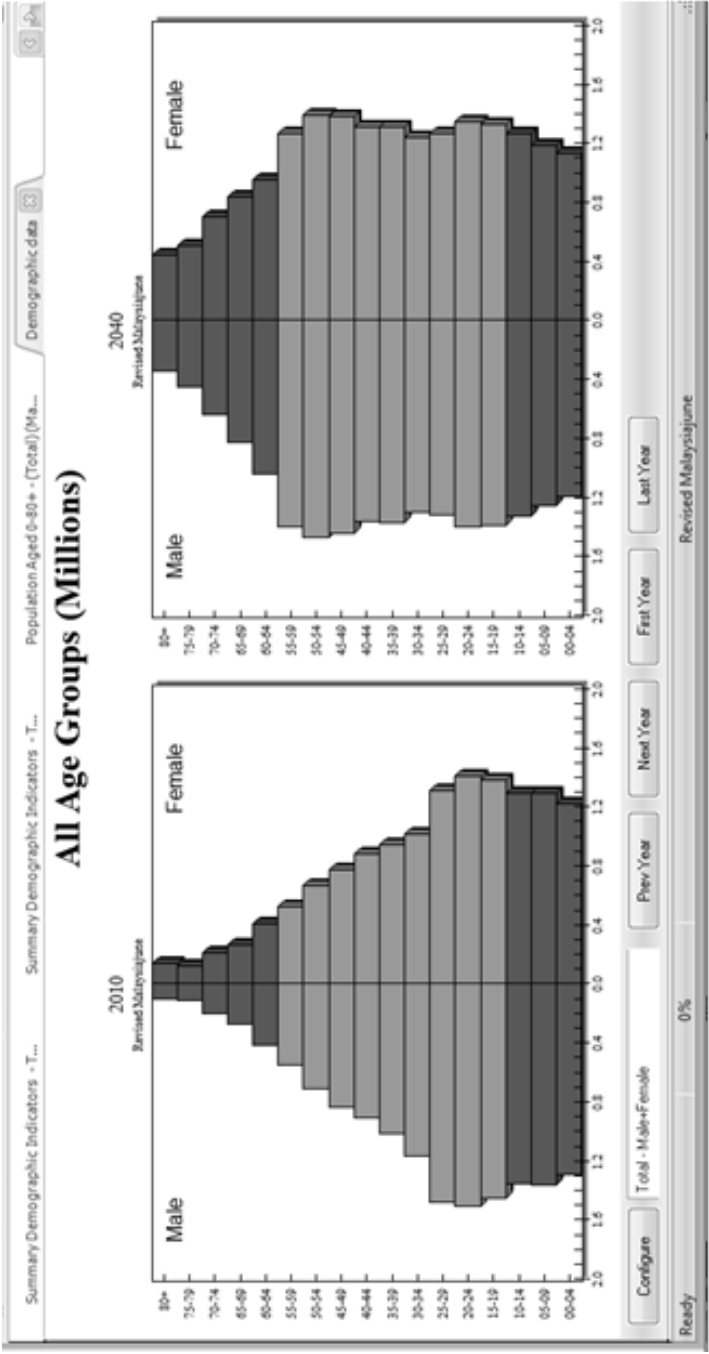
Figure 3.5: Population Pyramid, 2010, 2040

Table 3.5: Educational Requirements, 2010-2020

	Primary school students	Primary school teachers	Primary schools	Primary school expenditure (RM billion)	Secondary school students	Secondary school teachers	Secondary schools	Secondary school expenditure (RM billion)
2010	3,055,061	254,588	8,486	12.3	3,129,209	240,708	3,129	13.5
2011	3,092,060	257,672	8,589	12.7	3,100,977	240,386	3,101	13.8
2012	3,123,787	260,316	8,677	13.0	3,074,637	240,206	3,075	14.0
2013	3,128,162	260,680	8,689	13.2	3,054,777	240,534	3,055	14.3
2014	3,096,803	258,067	8,602	13.3	3,044,004	241,588	3,044	14.6
2015	3,094,004	257,834	8,594	13.5	3,042,314	243,385	3,042	15.0
2016	3,060,077	278,189	8,500	13.5	3,049,028	245,889	3,049	15.4
2017	3,029,619	275,420	8,416	13.6	3,061,004	248,862	3,061	15.9
2018	2,994,221	272,202	8,317	13.6	3,072,830	251,871	3,073	16.3
2019	2,994,665	272,242	8,319	13.8	3,064,822	253,291	3,065	16.6
2020	3,005,583	273,235	8,349	14.1	3,054,240	254,520	3,054	16.9

Note: For more details, refer to Lai Uin Rue, Cynthia (2010).

The number of secondary school students (remove class to sixth form) is projected to be around 3.0-3.1 million over the projection period. The requirement for secondary school teachers will increase from about 241 thousand in 2010 to about 255 thousand in 2020. The additional teachers to be trained and recruited will also have to take into account the number who will be leaving the services through resignation and retirement. The number of secondary schools required ranges from about 3,000 and 3,100.

The education sector has always been allocated the lion share of the government expenditure. The amount to be spent on primary and secondary education will be increasing from RM12.3 billion and RM13.5 billion in 2010 to RM14.1 billion and RM16.9 billion respectively in 2020.

Requirement for Health Services

With the projected increase in population and the standard as set in Table 3.2, the number of doctors required will have to be increased from about 33,000 in 2010, to about 48,000 in 2020, and the number of nurses required will have to be increased from 69,000 to about 84,000. This will require training and recruiting new doctors and nurses to cater for the increase in the demand for their services, and to replace those who leave the services. There is a need to increase the number of health centres and clinics, including private clinics from about 7,523 in 2010 to 9,706 in 2020. New hospitals will have to be built to cater to the growing population and those that are currently under-served. The hospital beds will need to be increased from 46,790 in 2010 to 64,682 or even more to alleviate the acute bed shortage. Health expenditure, both public and private will be increasing from about RM34 billion in 2010 to RM59 billion in 2020 (Table 3.6).

Requirements in the Economic Sector

With a labour force that is projected to grow from about 12.7 million in 2010 to 15.1 million in 2020, the number of new jobs to be created is about 273 thousand to begin with in 2010, and with the slower growth of the new entrants to the labour market, the number of new jobs required will be decreasing, as shown in Table 3.7. The number of child dependent will be around 7.8 to 8.0 million between 2010 and 2020. The GDP will be increasing from around RM1,000 billion in 2010 to RM1,616 billion in 2020. Per capita GDP will increase from about RM35 thousand to RM49 thousand during the same period.

Table 3.6: Requirements for Health Services, 2010-2020

	Doctors	*Nurses*	*Health Centres/Clinics*	*Hospitals*	*Hospital Beds*	*Health Exp (RM billion)*
2010	32,974	69,055	7,523	380	46,790	34.31
2011	36,520	70,398	7,716	390	48,280	36.54
2012	38,599	71,790	7,879	400	49,826	38.82
2013	39,641	73,195	8,087	410	51,447	41.17
2014	40,710	74,624	8,302	421	53,134	43.57
2015	41,815	76,093	8,522	432	54,879	46.03
2016	42,945	77,562	8,749	443	56,701	48.54
2017	44,108	79,044	8,980	455	58,593	51.11
2018	45,294	80,556	9,217	467	60,543	53.71
2019	46,512	82,055	9,459	479	62,576	56.37
2020	47,756	83,558	9,706	491	64,682	59.06

Table 3.7: Requirements for New Jobs, Child Dependents and GDP Growth

	Labour Force (thousand)	*New Jobs (thousand)*	*Child Dependents (thousand)*	*GDP (RM billion)*	*GDP per capita (RM)*
2010	12,684	273	7,822	1,000.00	34,979
2011	12,957	261	7,806	1,049.00	36,176
2012	13,218	252	7,809	1,100.40	37,413
2013	13,469	247	7,826	1,154.43	38,695
2014	13,716	246	7,850	1,211.11	40,024
2015	13,962	245	7,878	1,270.58	41,403
2016	14,208	244	7,906	1,333.09	42,840
2017	14,451	239	7,935	1,398.68	44,337
2018	14,690	231	7,966	1,467.49	45,898
2019	14,921	221	8,001	1,539.84	47,533
2020	15,142	197	8,042	1,615.76	49,241

Discussion and Conclusion

Development planning is aimed at reducing regional disparity and im-proving the standard of living and making places more liveable. Hence, there is a need to identify areas where population is growing rapidly, and also the population groups that are under-served. Population projections merely provide the number of "producers" and "consumers" of goods and

services, planners will still have to determine the standard to be achieved. For instance, to achieve a hospital bed population ratio of about 13.7 per 1000 population found in Japan and Korea, the number of hospital beds required in 2015 will be 7 to 8 times higher than that indicated in Table 3.6 (http://data.worldbank.org/indicator/SH.MED.BEDS.ZS).

The functional population projections presented in this chapter is meant to be illustrative of the kind of data that are needed for planning purposes. More detailed projections at sub-national levels are needed for effective planning to serve the various target groups. The population in the different states and regions grew at different paces, resulting in population redistribution. The population of Selangor grew very rapidly at 4.3% and 6.1% per annum in the 1980s and 1990s respectively. Despite the deceleration in the rate of population growth between 2000 and 2010, the population of Selangor still grew at 2.8% per annum, the highest in the country. Between 1980 and 2010, the average annual rate of population growth ranges from 0.9% in Perak to 4.3% per annum in Selangor and 3.9% in Sabah and Labuan. The rate of population growth also varied widely between urban and rural areas. Between 1980 and 2010, the urban population grew at 6.2%, 4.8% and 3.4% respectively, in contrast to zero growth in the 1980s and depopulation of 0.24% and 0.8% per annum in the rural areas. While rural development programs should still be given emphasis, more attention needs to be given to urban planning, as urban dwellers now make up three quarters of the total population, and the proportion is increasing.

Rapid population growth in certain geographical areas, in particular the cities, has severely challenged the capacity of the local authorities to provide adequate services and facilities such as schooling, health care, housing, employment, transportation, sewerage and garbage disposal. In Selangor the class size for primary and secondary schools averaged 39 and 44 respectively as compared to the national average of 26 and 33; and the student-teacher ratio in the state stood at 16 and 15 compared to 13 for both primary and secondary schools at the national level (DOSM, 2012d). The situation could be worse in some smaller geographical areas. On the other hand, some rural schools have been closed down due to the dwindling school going age population.

For healthcare services, the less developed states tend to fare worse than the more developed states. For instance, the doctor population ratio in Sabah and Sarawak is about 1 to 1,618 and 1,383 respectively as compared

to 758 at the national level. Besides the challenges in the provision of basic amenities and services, rapid population growth in the cities also created other problems such as escalating housing cost, traffic congestion, pollution and environmental degradation, and crime which must be dealt with urgently.

Population projections show that the younger age population will not be growing, as the number of births will remain at around half a million and even fewer in the next few decades. Educational, health and human resource planners and providers should focus more on improving the quality of the services rather than expanding the existing infrastructure. Investing in youth and improving their competiveness must be accorded high priority. The eroding standards of education, manifested by the poor performance of Malaysian students in the International Mathematics and Science Study and the Program for International Student Assessment conducted by OECD, and highlighted by Cheong *et al.* in this volume, warrant immediate remedial action. With delayed marriage and erosion of parental supervision, more and more young people are exposed to the various risks. Adolescent sexuality and juvenile delinquency have emerged as serious social problems. Appropriate programs, including reproductive health programs must be put in place to guide the young and to develop their potentials.

On the other hand, the number and proportion of older people will be growing rapidly, and this can put a strain on the social security system and health care. There is a need to improve the social security schemes and promote active and productive ageing to enable the older people who represent a pool of experienced human resource to contribute to national development. Various options such as retraining and flexi-employment schemes may be implemented to facilitate their continued participation in social and economic activities.

Increase in life expectancy is meaningless unless there is also a corresponding increase in health expectancy. Non-communicable diseases associated with unhealthy lifestyle are becoming a major health problem. Promoting healthy lifestyle and healthy living must be accorded the highest priority, to ensure that the additional years of life are not spent in ill health, which also poses as a burden to the healthcare system.

Much more remains to be done to provide the necessary data to planners for them to allocate the required resources to meet the needs of the various segments and sub-groups of the population such as ethnic groups, occupational groups, people with disability, the indigenous, etc. at the sub-

national level. For instance, for educational planning there is a need to have information regarding the number of school-going age children by ethnicity as most Chinese and Indians send their children to vernacular schools. Separate population projections for each of the main ethnic groups (outside the scope of this chapter) should be made, as there are variations in the demographic processes across the ethnic groups. Population projections and estimating the needs for the various population groups entails the collection of the relevant data and indicators at these levels.

Appendix 3.1
Assumed Age Distribution of Net Immigrants

	Male	*Female*
0-4	0.4	2.4
5-9	3.4	2.7
10-14	2.3	7.5
15-19	9.2	22.7
20-24	17.8	21.6
25-29	19.2	7.5
30-34	13.5	6.1
35-39	7.7	6.1
40-44	5.0	4.9
45-49	3.2	4.9
50-54	3.3	2.4
55-59	4.1	2.4
60-64	2.8	1.8
65-69	2.3	1.8
70-74	2.3	1.8
75-79	2.3	1.8
80+	1.2	1.8

Appendix 3.2
Projected Population by Single Age (0-23), 2010-2040

	2010	*2015*	*2020*	*2025*	*2030*	*2035*	*2040*
0	503,026	557,964	567,526	548,228	516,242	485,501	468,962
1	501,905	551,185	567,343	552,978	522,435	490,646	471,184
2	501,480	543,881	566,466	557,610	528,834	496,349	473,882
3	501,206	535,500	564,376	561,529	535,165	502,434	476,994
4	500,982	526,296	560,971	564,423	541,374	508,904	480,579
5	525,413	501,083	556,178	566,050	547,125	515,503	485,079
6	531,521	500,856	550,227	566,549	552,396	522,069	490,472
7	534,929	500,843	543,311	565,992	557,275	528,649	496,299
8	535,095	500,875	535,222	564,154	561,397	535,139	502,507
9	532,442	500,682	526,045	560,752	564,275	541,321	508,947
10	528,423	525,311	501,073	556,169	566,089	547,234	515,685
11	525,389	531,501	500,924	550,304	566,667	552,576	522,316
12	526,077	534,792	500,821	543,310	566,037	557,393	528,849
13	532,130	534,846	500,773	535,161	564,146	561,476	535,320
14	541,981	532,424	500,807	526,234	560,999	564,610	541,757
15	552,570	528,613	525,613	501,497	556,630	566,636	547,883
16	561,631	525,877	532,093	501,653	551,077	567,524	553,536
17	569,397	526,902	535,726	501,905	544,448	567,257	558,721
18	575,037	533,267	536,112	502,205	536,661	565,729	563,173
19	578,765	543,354	533,966	502,531	528,045	562,893	566,626
20	580,925	554,096	530,360	527,512	503,571	558,766	568,899
21	582,237	563,248	527,767	534,131	503,894	553,394	569,970
22	582,975	571,055	528,873	537,851	504,256	546,889	569,830
23	583,338	576,690	535,252	538,275	504,606	539,170	568,366

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4

POPULATION AND FAMILY POLICIES IN MALAYSIA

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Abstract

This chapter begins with an overview of the population and family situations since independence. This is followed by a description of the population/family planning policy at its earlier days in the 1960s and 1970s, before a reversal towards a pro-natalist policy in the mid-1980s, in light of the declining fertility, age structural shift and the emergence of labour shortage. With continuing fertility decline, it became clear that the target population of 70 million is not likely to be achieved, through natural increase. Since the mid-1980s, the program thrust has shifted to family and human resource development, with focus on strengthening the family institution. The government has implemented a host of family-friendly policies, described in this chapter. In view of the fact that a comprehensive family policy has yet to be implemented, this chapter concludes by highlighting the remaining challenges that need to be addressed.

Introduction

Since independence in 1957, Malaysia (then the Federation of Malaya until 1963) has experienced rapid changes in fertility, mortality and migration. Mortality and fertility declines were already underway in the 1950s, but a new wave of the influx of labour migrants emerged since the 1980s. Demographic changes are closely related to socio-economic

changes such as increase in educational attainment and female labour force participation. Demographic changes in turn affect family formation and family institutions.

Fertility decline attendant upon fundamental changes of the economy from agriculture to industry has resulted in the shrinking of the family size, increased mobility and population ageing. Demographic transition has also brought about profound social changes, such as the changing roles of women and the erosion of the extended family. Therefore there is a need for new policies to deal with the issues of family, gender and work-life balance. As there is a lack of comparative studies of family policy in non-Western countries especially in the Southeast Asian region, this chapter seeks to give an overview of the population-related policies in Malaysia that should interest policymakers, planners, social scientists and policy analysts.

This chapter begins with an overview of the demographic and social trends. This is followed by elucidating the population-related and family policies as well as programs associated with these policies. We conclude by providing some recommendations, taking into account the needs of emerging challenges that need to be addressed.

The Changing Population and Family Scenarios

When Malaysia was formed in 1963, the population of the country was approximately 9.0 million. By the first Malaysian census in 1970, the population had grown to 10.4 million, and this increased to 13.1 million in 1980, 18.4 million in 1991, 23.3 million in 2000 and 28.4 million in 2010. Between 1980 and 2000, the population was growing at a rate of about 2.6% annually, but slowing down considerably to 2.0% per annum between 2000 and 2010 (Department of Statistics, 1983; 1992; 2002 and 2011).

In terms of age structure, the population of Malaysia can be described as moderately young, with a median age of 24 years. In 1957, about 45% of its population was below 15 years old, but this declined to just 27.4% in 2010. On the other hand, the proportion aged 60 and above increased from 5.2% in 1970 to 5.8% in 1991 and 7.9% in 2010. The demographic trend shows that Malaysia is heading towards becoming an aged country by the year 2035 (Department of Statistics, 2012).

The crude death rate has been hovering at a low level of around 5 per thousand population for several decades. Hence, fertility transition has been the key determinant of population growth and age structural shift.

Figure 4.1: Total Fertility Rate, Malaysia, 1963-2012
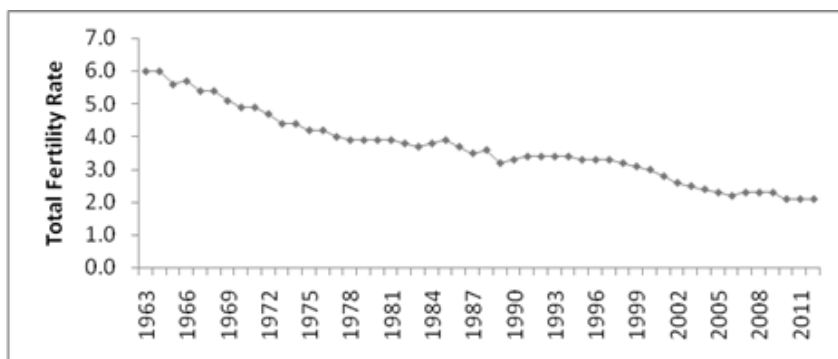
Source: Department of Statistics Malaysia, various *Vital Statistics*, 1963-2012.

The first sign of a sustained decline in fertility began to emerge as far back as 1958 (Hirschman and Fernandez, 1980). In 1991, the total fertility rate (TFR) stood at 3.4 children per woman, and this declined to 3.0 in 2000 and then to a replacement fertility level of 2.1 children per woman in 2012 (Figure 4.1).

Despite attaining replacement level fertility, the population will continue to grow for several decades due to the growth momentum. The proportion in the working age group will remain at around 60% of the total population, giving rise to the demographic dividend. According to the United Nations, Malaysia's TFR's will drop to 1.9 in 2020 and then to 1.8 in 2045-2050 (United Nations, 2013). The experience of many countries shows that the fertility rate would continue to decline below replacement level; as has occurred in Hong Kong (1.1), South Korea (1.3), Japan (1.4), Singapore (1.3) and Thailand (1.4). The TFRs of Myanmar and Vietnam which were at the replacement level of 2.1 in 2008 dropped to 1.9 and 1.7 respectively in 2013 (Table 4.1). Policies to reverse the declining fertility has proven futile in most countries.

The rising age at marriage is one of the key determinants of falling fertility. The postponement of marriage has contributed to an increasing age at first birth and hence fertility reduction. Table 4.2 shows that the trend towards delayed marriage can be traced back to the 1980s as a result of rising enrolment in educational institutions and employment among women (Tey, 2007a).

Table 4.1: Total Fertility Rate, Selected Countries, 2005-2010

Country	TFR		Country	TFR
Hong Kong	1.0		France	2.0
South Korea	1.2		New Zealand	2.1
Japan	1.3		**Malaysia**	**2.1**
Singapore	1.3		Myanmar	2.1
UK	1.9		Vietnam	1.9
US	2.1		Thailand	1.5
Canada	1.6			

Source: United Nations, *World Population Prospects: The 2012 Revision.*

Table 4.2: Singulate Mean Age at First Marriage (SMAM), Malaysia, 1970 to 2010

Year	SMAM (years)	
	Men	Women
1970	25.6	22.1
1980	26.6	23.5
1991	27.9	24.6
2000	28.6	25.1
2010	28.0	25.7

Source: United Nations, *World Marriage Data 2012.*

Table 4.3: Number of Households, Family Size, and Family Structure, 1980, 1991, 2000, 2010

	1980	1991	2000	2010
Number of Households (million)	2.5	3.5	4.8	6.4
Average Household Size (persons)	5.2	4.9	4.6	4.3
Family Structure (%)				
Nuclear	55	60	65	70
Extended	28	26	20	18
Single	9	8	7	8

Source: *Malaysian Censuses*, 1980; 1991; 2000; 2010.

Population census reports provide tabulations on the number of households, defined as "a group of individuals staying under the same roof and using the same facilities in the same house" and the average household size. Table 4.3 shows that while the number of households has increased from about 2.5 million in 1980 to 3.6 million in 1991, 4.8 million in 2000 and 6.4 million in 2010, the average household size has decreased from 5.2 persons to 4.9 in 1991, 4.6 in 2000 and 4.3 in 2010. In terms of family structure, the proportion of nuclear families has increased from 55% in 1980 to 70% in 2010. On the other hand, the proportion of extended families has decreased from 28% in 1980 to 18% in 2010.

The shift from extended to nuclear family has eroded the family support system. It has resulted in increased dependence on child care services, domestic maids as well as alternative child care arrangement. Socio-demographic changes have also led to the emergence of a "sandwich generation", with working adults having to support both their elderly parents and young children. With the rising cost of living, there is now a need for husbands and wives to work to cover household expenditure, as well as care for the young and the old. Work and family life has become highly interdependent with the rise of the dual income family, and more working women and men have to strike a balance between family and career. Although findings from the 2004 Malaysian Population and Family Survey show that family members are still the main source of child care for working parents, this support is diminishing. More and more families are hiring domestic maids to take care of the children and elderly parents (NPFDB, 2004).

In short, Malaysian families are facing rapid changes and new challenges due to rapid industrialisation, modernisation and globalisation. Never before has changes been so rapid, where developments in the external environment can immediately have an impact on the families. These changes can profoundly alter the pattern of contact, sharing and relationships in families. The emerging trends and challenges include the following:

- The structure, roles and responsibilities of Malaysian families will continue to change as a result of modernisation and urbanisation;
- Work and family life will become highly interdependent with the rise of dual-income families;
- More parents will face a "time-bind" which may result in weakening of family relationships and inadequate value transmission to the children;

- Changing attitudes towards relationships, marriage and family may contribute to more Malaysians remaining single, delaying marriage and having fewer children;
- Youth may adopt increasingly liberal views towards sexual intimacy, marriage, commitment and childbearing.
- The gender roles and family relationship will be changing as more women will enter the labour force due to processes of modernisation, industrialisation and higher education; and
- Population mobility will increase due to development of new townships, job transfers and new job opportunities. Adjustments to new environments, such as different homes, neighbourhoods, changing jobs, schools, and friends will present many challenges to all family members.

Evolution of the Population Policy in Malaysia

Government programs and initiatives can directly or indirectly alter the country's demographic processes and structure. Corsa and Oakley (1979) define government population policy as those "actions of government that affect or attempt to affect the balance between births, death, and migration of human beings".

The evolution of the national family planning program in Malaysia was rather well documented. Some of these have reported the circumstances that led to the change in the official stand on family planning, which was considered a sensitive topic previously; and these reports and articles also traced the various stages in the development and evolution of population and family policies (Lee *et al.*, 1973; Chander *et al.*, 1977; Noor Laily, 1981; Noor Laily *et al.*, 1982; Hamid, 1988; Govindasamy and Da Vanzo 1992; Tey, 2007b).

Prior to the 1960s, there was no explicit population policy with regards to population size and growth in Malaysia. However, at the time of formulating the First Malaysia Plan (1966-1970), the emergence of economic problems due to falling rubber price and rising numbers of unemployed persons led to the passage of the National Family Planning Act, 1966 and the implementation of the National Family Planning Program in 1966. The objective of the policy under the Act was to lower the population growth rate from 3.0% in 1966 to 2.0% by 1985 (Government of Malaysia, 1966).

Prior to the inception of the family planning program, the family planning movement was spearheaded by the Family Planning Association

of Selangor, a voluntary organisation. Encouraged by the success of clinics in Selangor and Kuala Lumpur, similar associations were formed in the states of Johor, Perak and Malacca between 1954 and 1959. In 1958, the Federation of Family Planning Associations Malaysia (FFPAM), funded mainly by the International Planned Parenthood Federation (IPPF) was formed to coordinate and strengthen the family planning movement (FPA, 1965; Saw, 2007; Tey, 2007b).

Population Control Policies: The Family Planning Program

As mentioned above, fertility rates have been falling steadily in Malaysia since 1957. The crude birth rate (CBR) had declined from 46.2 to 17.6 per 1000 population between 1957 and 2011. Three primary factors affecting fertility decline were: i) the socio-economic development and the consequent changes in desired family size, ii) the dissemination and acceptance of family planning by the public, and iii) sharp reduction in child mortality.

The National Family Planning Board (NFPB), now National Population and Family Development Board (NPFDB) was established in 1966 under the Population and Family Development Act 1966 (Act 352) as a statutory body having certain degree of autonomy. The main function of the Board was the implementation of family planning program throughout the country. The Malaysian Population and Family Surveys (MPFS) conducted by the National Population and Family Development Board in 1974, 1984, 1994 and 2004 showed that contraceptive prevalence rate had increased from 30% in 1974 to about 50% in 1984 but has remained at that level since, while the prevalence rate for modern methods has increased from 25% in 1974 to 34.4% in 2004 (NPFDB, 2004).

The national family planning program was implemented in stages, as follows.

The Contraceptive Clinical Approach (1966-1973)

Between 1966 and 1973, the National Family Planning Program adopted a clinical approach using existing hospitals, health clinics of the Ministry of Health, private practitioners and Family Planning Associations (FPAs). The family planning program was implemented in the Federal Land Development Authority (FELDA) schemes to reach out to the rural areas. FELDA

promoted family planning practice throughout its schemes as part of an important development strategy towards achieving its overall social and economic objectives (Noor Laily, 1981).

The Multi-disciplinary and Multi-sectoral Approach (After 1973)

The contraceptive clinical approach was found to be inadequate to deal with issues related to population at the macro level and family development and welfare at the micro level in a rapidly changing world. Hence, the first Population and Family Health Project, a multi-disciplinary approach to the population problem, was launched in 1974. This project, with joint-financing from the World Bank, the United Nations Fund for Population Activities and the Government of Malaysia, was designed to strengthen and intensify the family planning program as well as maternal and child health services. In 1978, the Government approved the second Population and Family Health Project, which was designed to improve the population and family planning program activities in both rural and urban areas. The scope of the family planning service delivery system was further expanded to include the improvement of the status of women, particularly that of rural women. This second project provided infrastructural development for specialised family planning services and bio-medical fertility research. This approach also included social programs and activities aimed at raising the quality of life. A three-pronged approach, involving health, environment and social welfare services was implemented to promote greater participation from the community to improve the lives of the urban poor (Noor Laily, 1981).

The 70 Million Population Policy

The emergence of labour shortage in the early 1980s prompted the Government to call for a review of the population policy. In his speech at the UMNO General Assembly in September 1982, Prime Minister Mahathir Mohamad suggested that Malaysia could aim for a population of 70 million as it has abundant natural resources. The 70 million population policy was officially announced in the *Mid-term Review of the Fourth Malaysia Plan (1981-1985)*. The official view was that "continued population growth does not necessarily have a negative effect on development, and that a larger population and the domestic market can be beneficial in achieving national development goals provided that the quality and productivity of

the population are being constantly raised". Thus, a specific population size of 70 million was identified as an ideal target towards which Malaysia might aim at over a very long time horizon of 115 years (Government of Malaysia, 1984). In the subsequent plans, while no mention has been made on this "new" policy, the forces of socio-economic changes have resulted in continuing fertility decline. An assessment of the population policy conducted in 1992 concluded that the 70 million population target will not be achieved by the year 2100 based on natural increase (NPFDB, 1992).

Rather than focussing on the size of the population, Vision 2020, adopted in 1991, placed great emphasis on human resource development as well as the need for the creation of economically resilient and fully competitive citizens. In this respect, it is the quality rather than quantity of the population that matters (Government of Malaysia, 1991). Therefore, the main thrust of the program was directed to sustain population growth that is in balance with resources and development, in line with the Government's efforts to move Malaysia to become an industrialised nation, but at the same time maintaining quality population founded on a healthy, resilient and stable family system.

The Second Population Strategic Plan Study conducted in 2009-2010 found that Malaysian families are getting smaller and the total fertility rate is dropping much faster and may reach replacement level fertility of 2.1 children per woman by 2015 (NPFDB, 2010). The following recommendations were made in the study report to arrest or slowdown the fertility decline so as to prevent a negative rate of natural increase by putting in place policies that will sustain fertility at replacement level, while enabling couples to pursue their career and family formation:

- introducing paid paternity leave as part of the government's support for gender roles in childrearing;
- providing paid compassionate leave in cases of children's sickness;
- introducing flexible working hours;
- providing child-minding facilities at the workplace, and government subsidies for childcare costs incurred by working mothers;
- increasing tax rebate for dependent children;
- implementing programs to encourage husbands to be more fully involved in childrearing and household activities; and
- addressing the unmet needs for contraception especially among disadvantaged groups, while providing infertility services to help childless couples who want to have children.

Other Population-related Policies

In line with Vision 2020, the Program of Action (PoA) adopted at the 1994 International Conference on Population and Development, the Millennium Development Goals (MDGs), and the 2002 Madrid International Plan of Action on Ageing (MIPAA), many new policies and programs have been formulated and implemented to improve access to sexual and reproductive health services, enhance women empowerment, and to cater to the need of a rapidly increasing number of older people. Most of these policies are under the purview of the Ministry of Women, Family and Community Development (MWFCD).

National Social Policy (NSP)

The National Social Policy (NSP), adopted in 2003, provides the framework for planning and implementing social development programs. Its vision is to create a progressive Malaysian society with every member having the opportunity to develop his/her potential in a healthy social environment based on the qualities of unity, resilience, democracy, morality, tolerance, progress, care, fairness and equity to achieve the goal of Vision 2020. The objectives of NSP are to ensure that the basic necessities of the individual, family and community are provided for, as well as to develop and empower human life, consolidate social support systems and services and generate multi-sector synergy. This policy is being reviewed, to be replaced with a New Social Model.

National Policy on Women and Plan of Action (NPW)

The Government has been playing an increasingly supportive and promi-nent role to achieve greater gender equality. It has provided an enabling environment for the advancement of women at both the national and international levels. At the national level, the formulation of the National Policy on Women (NPW) in 1989 marked a turning point, enunciating for the first time clear guidelines for the effective participation of women in the country's development. The policy was revised in 2009 with a vision to ensure an equitable sharing of resources and benefits of development for men and women. With women still lagging in terms of numbers employed and in decision-making positions, despite becoming more educated, this policy is aimed at increasing recognition of women's role as well as integrating them into all sectors of development.

National Policy on Reproductive Health and Social Education (PEKERTI)

The National Policy on Reproductive Health and Social Education was introduced in 2009 with the aim to empower individuals with knowledge and positive attitudes towards social and reproductive health. The adoption of this policy has facilitated and enhanced the existing adolescent psychosexual programme through the introduction of the Reproductive Health and Social Education in the National Service Curriculum (PEKERTI@PLKN) in 2011 and Health and Social Education in schools (PEKERTI@SCHOOL) in 2012. These initiatives complement the activities of the young people-friendly centres (kafe@TEEN) which was first established in 2006 and have benefited many young people in Malaysia.

National Policy for Older Persons and Plan of Action

The 1995 National Policy for the Elderly was revised and replaced with the National Policy for Older Persons in 2011, to provide an enabling and supportive environment to promote the wellbeing of older persons as well as healthy, active and productive ageing. Policy initiatives include increasing the retirement age to 60 years, tax rebate for the cost of retraining older persons and another tax rebate of up to RM5,000 to encourage family care.

Family-friendly Policies in Malaysia

The centrality of the family has been re-emphasised. The family offers companionship, security and protection to its members. Rapid socio-economic development and demographic transition have resulted in major changes in family structure and eroded the capacity of the family to care and support the young and the old.

Since the 1960s, Malaysia's family policy can be classified, after Gauthier (1996) as "pro-traditional model", with the preservation of the family the main concern. The government takes some responsibility for supporting the family but the families and voluntary organisations remain the main pillars of old age support.

Malaysia has long had an implicit family policy. The main strategy focuses on means-tested benefits, community/society assistance, abuse prevention and poverty alleviation. As for work-life balance, the government has chosen to let employers play their role voluntarily rather than coercion through legislation. Family-friendly practices in the workplace have there-

fore been based mainly on the understanding between the employer and the employee or based on the tax-incentives for employers. Currently, family-friendly policies include the following.

Parental Leave Policies

The 1955 Employment Act allowed maternity leave up to 60 consecutive days with full pay. The maternity leave has been increased from 60 days to 90 days since the beginning of 2011 for civil servants. Some banks and multinational companies also follow the 90-day maternity leave rule. The leave taker can receive a hundred per cent monthly salary during childcare leave. In addition, the government also endorses 5 years unpaid leave for childcare without losing out on seniority and service. For working fathers, paternity leave for civil servants has been increased from 3 days to 7 days beginning 2003.

Childcare Policies

Childcare policy has received increasing attention since the mid-1980s because of the growing recognition of the need to balance work and family for working adults with young children. The formulation of the Child Care Centre's Act 1984 (Act 308) is aimed at facilitating registration, monitoring and inspection of childcare centres. Act 308 is intended to ensure quality of the centres for children below four years. The passage of the Child Care Centres (Amendment) Act 2007 expanded the scope for regulating and stimulating the growth of childcare industry. The caretaker for this Act is the Department of Social Welfare, MWFCD.

Workplace Child Care, Community Child Care and PERMATA

As more women are now engaged in the modern sector labour market, the MWFCD has been promoting the establishment of childcare centres in the workplace in 2007. However, the response from the private sector has been lukewarm (Ministry of Education, 2007).

MWFCD has also set up community childcare centres to provide affordable and accessible childcare services. Community childcare centres are "childcare centres managed by organisations appointed or approved by the government, receive assistance from federal or state government, with 10

or more children" and using the curriculum set by MWFCD. This program aims to have childcare centres in all districts in Malaysia. This will involve the participation of the local community, parents, children, governmental agencies as well as private organisations.

The latest entry to childcare centres in Malaysia is the PERMATA program. The program came under the Deputy Prime Minister's Office when it was launched in 2006, but is now a department under Prime Minister's Department. PERMATA provides integrated quality care and early education services to children below 5 years old and their families based on the need of the local community. PERMATA also has an out-reach program that provides parenting courses, counselling, and healthcare services and to promote a healthy and safe lifestyle among local communities. Under this program, community resource centres and libraries have also been set up to provide community services by involving speech therapists, nutritionists and other professionals (Ministry of Education, 2007).

Childcare Subsidy

The government provides childcare subsidies to families with children under 6 years of age. The subsidies are divided into means-tested and non-means tested subsidies under the Child Care Centres (Amendment) Act 2007. A RM180 subsidy is given for each child attending the childcare centres at the workplace for civil servants with a monthly household income of less than RM5,000, and this is also given to all families with monthly income below RM2,000 in urban areas and RM1,200 in rural areas who send their children to community childcare centres. Parents with monthly household income of not more than RM900 are given RM250 for sending their children to private childcare centres registered under the Social Welfare Department. Government agencies that provide childcare centres at their workplace are given a RM200,000 grant to renovate and furnish their facilities. Private sector companies are given a 10% tax reduction per annum for a period of 10 years for setting up childcare centres at their workplace. In addition, a tax relief of RM1,000 per child under the Income Tax Act 1967 is given to all citizens.

Flexible Working Arrangements (FWA)

This collaborative program of MWFCD and TalentCorp[1], also known as FlexWorkLife.my, was created to deal with the challenges women face in

having to juggle family commitments and work responsibilities. It aims to build a network of employers and talents to optimise work-life integration, while maximising work efficiency and enhancing employee potentials and skills.

A recent study reveals that many employers have adopted some family-friendly practices such as leave entitlements. However, few have flexi work arrangement to enable working women to combine work with household chores, as well as the care of the old and the young (Subramaniam and Selvaratnam, 2010).

The National Family Policy (NFP)

Recognising the challenges faced by families, the Government has focused on strengthening and implementing policies while taking positive steps to help the families, especially in balancing the work-life to ease their burden. The Government also realises the importance of involving all the stakeholders in helping families to overcome the many challenges. As such, the National Family Policy (NFP) was launched on 19 March 2011, which advocates the concept of family wellbeing based on family values such as being caring, honesty, justice and equity regardless of status, gender and age. At the macro level, the policy acts as the catalyst to urge all stakeholders to take into account family perspectives in all their planning, strategy formulation or development efforts, either through their commitment and formulation or review policies and laws that are not family friendly to ensure that programs, services and family friendly facilities are accessible to all.

The NFP has the following three strategic thrusts:

a) To increase the commitment and involvement of various stake-holders to prioritise the family perspectives in all socio-economic development efforts;
b) To ensure that laws, policies, procedures and enforcement of laws prioritise the family perspectives; and
c) To ensure that programs, services and family friendly facilities are accessible.

To achieve the aims of the NFP, the MWFCD has identified the following strategies:

a) Research and development on family wellbeing;
b) Advocacy to prioritise family wellbeing;

c) Training and lifelong education for human capital development and family wellbeing;
d) Provision of resources;
e) Conducive environment for family empowerment;
f) Consultation and strategic partnerships with various government agencies, private sector, NGOs, institutions of higher learning and the community; and
g) Monitoring and evaluation.

Current Programs for the Family

The Government has adopted innovative measures via the National Blue Ocean Strategy (NBOS) to enhance public sector services and program delivery to support the family. Through this strategy, it encourages the participation of the public, private and people (the 3Ps) to spearhead national development. This collaboration is expected to lead to high impact achievement, low cost and rapid execution of government programs and services. Among the NBOS initiatives is the 1Malaysia Family First (1MF1st) movement implemented under the National Family Policy. The program and activities have the following key focus areas:

a) Commitment to a family perspective;
b) Policies and laws to be reviewed so as to be more family friendly; and
c) Enhancing accessibility to family friendly services.

Taking cognizance of the family's role in Malaysian society, the Prime Minister has declared November the National Family Month. As an incentive to encourage celebration of the Family Month, any company that organises family activities for their employees would be given tax exemption for the expenditure incurred.

Since the early 1990s, NPFDB has carried out programs to enhance the wellbeing of the family. These programs consist of training modules on marriage preparation and marriage enrichment, parenting skills for parents with young children and teenagers, fatherhood, adolescent development and counselling services for families and adolescents.

With increasing participation of women in the labour force, concrete steps have been taken to create awareness and provide knowledge to parents on the need to balance work and family life. The Parenting@Work program conducted at the workplace was launched in 2007 to provide guidance on

parenting skills, ensure stable and resilient family units and equip families to deal with modern-day challenges and work-life balance issues. NPFDB has introduced a family financial management program called SMARTBelanja@ LPPKN in 2009. This program is implemented in collaboration with Credit Management and Counselling Agency (an agency under the Central Bank of Malaysia) and NGOs as one of the strategies to help families to plan their expenditure prudently.

Family Wellbeing Index

NPFDB has developed a Family Wellbeing Index (FWI) in 2011. The index comprises of seven domains that cover key family wellbeing components, namely family relations, family economy, family health, family and community, family and religion, family and safety, as well as housing and environment. The index measures the subjective wellbeing of families. In 2011, the Malaysian wellbeing index stood at 7.55 out of 10. This indicates that Malaysian families have a relatively high level of wellbeing and are able to manage the challenges of development.

Conclusion

Since the inception of the National Family Planning Program in 1966, the population policy has been evolving to keep up with socio-economic changes. The most dramatic change took place when the government reversed its policy from ante-natalist to pro-natalist, with the aim of achieving a 70 million population in 2100. However, consequent upon rapid socio-economic development, the continuing fertility decline has resulted in low rate of population growth. In keeping with the objectives of the Program of Action adopted at the 1994 International Conference on Population and Development in Cairo, the Malaysian population policy has shifted towards family development and human capital development.

The NPFDB, the main implementing and coordinating agency in charge of population and family development, has been conducting various research to provide inputs in guiding policy formulation and program implementation to ensure the achievement of national objectives. The Board has also undertaken two Population Strategic Plan Studies, one in 1992 and another in 2009 to take stock of the progress made and identify the remaining and emerging challenges, as well as to provide policy recommendations.

More women are now entering the labour market. Yet in most instances, women are also solely responsible for household chores. The multiple roles that women play may result in stress and burn out, which in turn lead to family dysfunction. There is therefore a need to promote male participation in household chores and to care for the old and the young. To assist working women in child care, the government is taking steps to encourage and facilitate the setting up of childcare centres at the workplace. Removing the obstacles of child care faced by working women may help improve family wellbeing. In light of the problems faced by working adults in maintaining a work-life balance and challenges that still need to be addressed, more attention needs to be given on these issues. Malaysia is still in need of a comprehensive family and population policy which must be reviewed from time to time to keep up with social changes. All the stakeholders should work hand in hand towards making Malaysia a developed country in which the welfare of the people will revolve not around the state or the individual but around a strong and resilient family system as envisaged in Vision 2020, as part of the long term development strategies.

Note

1. TalentCorp was established on 1 January 2011 under the Prime Minister's Department to formulate and facilitate initiatives to address the availability of talent in line with the needs of the country's economic transformation. Collaborating closely with relevant government agencies and employers in priority economic sectors, TalentCorp develops demand-driven initiatives to enhance graduate employability, promote talent diversity, engage Malaysians abroad and facilitate foreign talent.

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POPULATION, HUMAN CAPITAL AND DEVELOPMENT: THE MALAYSIAN EXPERIENCE

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Abstract

Like other countries in East and Southeast Asia, Malaysia has undergone a rapid demographic transition to low fertility. This has meant a growing share of the economically active population that will eventually peak as ageing becomes more pronounced. The potential increase in the labour force has been undermined by both rising enrolment in upper secondary and tertiary education, as well as by many females remaining outside the labour force. Together with high economic growth, this has created a shortage of labour. Immigrant labour, both legal and illegal, has stepped in to fill the gap but entrenched a low labour cost model. Breaking out of this requires strengthening the country's human capital base. While generous government expenditure and liberalisation of the education sector have resulted in significant gains in numbers enrolled, several factors have had a negative effect on education quality. Unless reversed, this deterioration in education quality has long-term implications for the country's development.

Introduction

The population-development nexus is multifaceted and very complex in that the demographic transition is not only part of development but also has consequences for other areas of development. These consequences are both positive and negative, and are experienced at the macro (country),

regional (sub-national) and local levels (McNicholl, 2003: 3). And they are shaped by both total numbers – population size – and the structure of the population. Population and its composition is itself impacted by contextual factors, such as cultural attributes and social norms, and structural factors, such as national population policies.

Among the earliest discourses about the population-development nexus is that relating population to economic growth. Although Malthusian predictions of doom had been discredited, the development literature of the 1960s has been rich with debates about whether rapid population increase retarded economic growth in developing countries.[1] Unlike in South Asia, on which Myrdal wrote pessimistically (Myrdal, 1968), and Indonesia, the subject of Geertz's thesis on agricultural involution (Geertz, 1963), the East Asia experience has generally been one in which economic success has been associated with rapid transition from high to low fertility. The complexity of this relationship notwithstanding, Mason (2003: 12-13) pointed to several lessons – the rapidity of transition given the right circumstances, the diverse paths to transition, the complex nature of the development impact of population change, and the importance of policies and programs to achieve favourable outcomes.

Of the multifaceted impacts of population on economic growth, among the most critical is that on the size and nature of a country's human resource, referred to by economists as human capital. As countries advance economically, economists recognise that human capital more than physical capital holds the key to higher income, enabling the adoption of technology and the strengthening of institutions (see, for instance, Ranis and Stewart, 2000; Rosenweig, 1987). Indeed, human capital deficiency is postulated to lead to middle-income countries' inability to upgrade technology and thus fall into the "middle-income trap" (Gill and Kharas, 2007).

This chapter discusses issues relating to population, human capital development and their implications with specific reference to Malaysia. Malaysia is part of the East Asia experience, but it has several characteristics which render it unique. First, it has a multi-ethnic population each with its own demographic profile and dynamics that are partly the product of history. Second, this multi-ethnicity figures prominently in the country's politics. Third, its stock of human capital has been augmented at different stages of its history by immigrants from other lands. Its experience with respect to the fertility transition and human capital development also has major significance for policy and even lessons for other countries.

The objectives of this chapter are fourfold. The first is to briefly review Malaysia's population dynamics, specifically its fertility transition and international migration, both of which have been important in shaping the size and nature of the country's human resource base. Second, Malaysia's experience of human capital strengthening through education and training is reviewed in the context of human capital deepening that Malaysia requires in its efforts to "graduate from the middle".[2] Third, an assessment is made of these efforts not only in relation to the above stated objective but also in the broader context of human development. Finally, lessons are drawn from the Malaysian experience.

This chapter is structured as follows. The next section describes Malaysia's population dynamics from about 1970 to the present, a period in which rising income has occurred in tandem with falling fertility rates and in which the most recent decade saw rising immigration, consisting of legal contract workers and illegal immigrants. These developments had major consequences for the country's labour pool. Section 3 examines Malaysia's efforts at deepening this pool through education and training. Section 4 undertakes an assessment of the efficacy of these initiatives. The final section concludes with comments on lessons from the Malaysian experience.

The Malaysian Demographic Experience

Like several countries in East and Southeast Asia, Malaysia experienced a demographic transition to low fertility at a time when the economy was undergoing rapid economic growth. This transition was not apparent when examining total population figures from 1960 onwards (Table 5.1).

Table 5.1: Malaysia's Demographic Transition, 1960-2010

Census Year	Population (mil.)	Population Growth Rate (%)	Crude Natural Increase Rate (%)	Population Aged 15-64 (% of Total Population)	Population Aged 0-14 (% of Total Population)
1960	8.0	–	3.1	53.4	43.8
1970	10.4	2.7	2.6	52.2	44.5
1980	13.1	2.3	2.5	56.5	39.9
1991	17.6	2.7	2.3	59.2	37.2
2000	23.4	3.1	1.9	62.0	34.1
2010	28.3	2.0	1.3	67.3	27.6

Source: Department of Statistics, Malaysia, various publications.

Population figures during this period were affected by two major events, one political and one demographic. The political event was the race riots of 1969 which resulted in a flow of non-Malays to Singapore and overseas, bringing down the population growth rate between 1970 and 1980 to 2.3% (Saw, 2007: 15). The other is immigration since the late 1980s, which produced a population growth of 3.1% per annum between 1991 and 2000 but came down to 2.0% per annum between 2000 and 2010. The extent of immigration can easily be gauged by comparing the population growth rate with the rate of natural increase. It added 0.4% to the latter in 1991, 1.2% in 2000, and 0.7% in 2010.

The transition to low fertility is apparent from the crude rate of natural increase, which was more than halved between 1960 and 2010. This transition has produced, from 1970, a dwindling share of the population aged 14 and below and a growing share of working age (15-64) population. As the population ages, the share of the economically active population, representing the demographic dividend, will eventually peak and shrink as the age group 65 and above expands.

The economically active population represents the pool from which the labour force is drawn. The latter is shown in Table 5.2. Just over a third of the working age population is not in the labour force and this has remained almost unchanged over the past two decades. Malaysia's labour force participation rate, at only about 65%, is the result of female participation

Table 5.2: Factors Affecting the Size of Malaysia's Labour Force, 1990-2010

Year	Labour Force Participation Rate (%)		Education Gross Enrolment Rates (%)		
	Total	Female	Primary	Secondary	Tertiary
1990	66.5	47.8	93	54	7
1992	65.9	46.9	95	56	9
1996	66.3	46.8	97	57	11 (1995)
1998	64.3	44.4	96	67	22
2000	65.0	47.2	96	66	26
2002	64.4	46.7	98	66	27
2004	64.4	47.2	96	72	30
2006	63.1	45.8	100	68	29
2008	62.6	45.7	–	66	34
2010	63.7	46.8	–	67	37

Sources: Department of Statistics, Malaysia (2009; 2013); UNESCO (2013).

rates much below those of her neighbours and other East Asian countries (Cheong *et al.*, 2013: 7). Participation in the labour force is also reduced by rising enrolment at both the secondary and tertiary levels of education. In particular, the enrolment rate in tertiary education doubled between 1996 and 1998 as a result of the introduction of the Private Higher Educational Institutions Act (Act 555) 1996.

Although not comparable to the above in terms of numbers, the labour supply is also depleted by a growing number of Malaysians leaving the country for greener pastures abroad.[3] From 1980 to 1990, the World Bank (2011: 91) estimated that this outflow grew at 4.2% per annum, increasing by 50% the stock of Malaysian migrants overseas. Over the following decade this stock increased another 40%, averaging growth of 3.6% a year.[4] This "brain drain" is more than about numbers, being both location- and skill-selective. Singapore is the recipient of up to half these migrants, while 60% are highly skilled. Australia has the second largest of the Malaysian community living overseas (Hugo, 2011).

With an unchanged participation rate, brain drain notwithstanding, the size of Malaysia's labour force would have grown with the share of the working age population in addition to the natural increase in the population. This growth, however, is insufficient to meet the even more rapid expansion of labour demand, fuelled by heady economic growth rates that, although interrupted by recession in the mid-1980s, reached 9.1% between 1990 and 1997 when the Asian Crisis broke (NEAC, 2010: Figure 5).[5] This labour deficit was made good by immigration of foreign workers, both legal and illegal. Table 5.3 shows the rapid growth in legal immigrant workers between

Table 5.3: Flow of Legal Immigrant Workers to Malaysia, 1999-2008

	No. of Immigrant Workers ('000)	*% Share from*			
		Indonesia	*Bangladesh*	*Thailand, Philip-pines, Pakistan*	*All Other Sources*
1999	410	65.7	27.0	2.9	4.4
2001	850	74.7	13.5	2.0	9.8
2004	1,470	69.7	3.7	1.6	25.0
2008	2,062	52.6	15.3	3.3	28.7
% Change p.a. 1999-2008	+19.7	+16.8	+12.4	+21.5	+47.7

Source: EPU (2014) Table 1.4.1.

1999 and 2008. Indonesians have been dominating this flow since 1999 and even before, but diversification in source country suppliers of labour is evident from the annual growth rate of 47.7% of the group "All Other Sources" during this period.

In addition to legal migrant workers, there has been a large influx of illegal migrants, mainly from Indonesia and the Philippines.[6] Estimates of the number of these illegal migrants cannot be verified, but the figure of 2 million had often been cited (for instance by Quek, 2006). However, some credence to this number can be given by the approximately 1.3 million illegals who registered under an amnesty program (the "6P Program") (Bernama, 2011). Other indirect evidence comes from population data for the state of Sabah. The population of that state grew from about 600 thousand in 1970 to 3.1 million in 2010, an average annual increase of 4.2% over 40 years. Even if the natural rate of increase in Sabah had been 3% a year that would have produced a population of about 1.95 million in 2010. The balance of 1.15 million people would have been immigrants. And since legal foreign workers are primarily in Peninsular Malaysia where much of the manufacturing is located, these immigrants would have been illegals. Indeed since about 800 thousand residents of Sabah were estimated to have moved to Peninsular Malaysia for work (Quek, 2006), the number of illegals in Sabah alone would have numbered about 2 million.[7]

Malaysia's demographic and socio-economic evolution since 1970 can thus be summarised as a rapid fall in fertility leading to a growing share of the economically active population, of which about a third had stayed outside the labour force. The latter is made up of students in upper secondary and tertiary education, as well as females. Since 1980, outmigration of skilled labour has been on the rise, magnifying the loss of human capital. Significant low-skill migrant worker inflows augmented the country's labour supply, enabling sustained high economic growth through the traditional labour intensive model.

In the face of a labour supply constraint, an important strategy, implemented successfully by Korea and Taiwan, is to deepen the human resource pool to enable the economy to move up the value chain through education and training. Malaysia clearly embraces this strategy. In putting forth his "Vision 2020", then Prime Minister Mahathir Mohamad (1991) stated: "In order to achieve this economically just society, we must escalate dramatically our programmes for national human resource development… there has to be the fullest emphasis on making the needed advances at speed and with the

most productive results – at the lowest possible economic and societal cost." How well have the country's programs translated this vision into practice?

Education and Training for Human Capital Development

In reviewing Malaysia's performance in human resource deepening, two dimensions – one quantitative and the other qualitative – merit consideration. From a quantitative perspective, Malaysia has made substantial progress. There is little doubt that in terms of access to education, Malaysia has achieved 100% coverage of primary education and therefore the UN's Millennium Development Goal 2 of universal primary education (UN, 2011: 3). Two-thirds of youth of the appropriate age group are in secondary schools while a third are in tertiary education in 2010, compared to just over half and under a tenth respectively in 1990.

It has also achieved parity both in respect to ethnicity and gender in both primary and secondary education. Using cohort analysis, Hirschman (2013a) showed the narrowing and closure of gaps between ethnic Malays, Chinese and Indians entering the first year of primary school, those with up to lower secondary education completed, and those who completed secondary school. Indeed, for the second and third categories, Malays had gained a decided advantage over the other ethnic groups from the 1955-1964 birth cohort onwards (Table 5.4).

Likewise, gender parity has been more than achieved (UN, 2011: 33-35). Shyamala *et al.* (2014: 129) reported that since the early 1990s, enrolment rates for females have been equal to or exceeded those for males at all levels of education, and together with higher retention rates, the disparity in favour of women rose with the level of education. This parity is reflected in the equalisation of literacy rates among those aged 15-24 (UN, 2011: 35).

This quantitative achievement has been made possible largely by generous government expenditure. Malaysia spends more on education as a share of GDP and as a share of the total government budget than most of its East Asian peers (Table 5.5). This spending has also been escalating from one five-year plan to the next. The development expenditure allocation for the Ninth Plan 2006-2010 was RM40.4 billion, two and a half times that for the Seventh Plan's RM17.5 billion (Cheong, Selvaratnam and Goh, 2011: 168).

At the tertiary education level, the passage of the Private Higher Educational Institutions Act in 1996 that opened up tertiary education to the private sector was a milestone that saw the expansion of enrolment in private sector institutions.[8] This expansion was so rapid that in a little over

Table 5.4: Achievement by Levels of Education among Malaysia's Ethnic Groups

Education Achievement/ Ethnic Group	Birth Cohort				
	Before 1905	1905-14	1925-34	1945-54	1965-74
% Entering Primary Year 1					
Malay	35	47	72	93	97
Chinese	53	58	76	93	94
Indian	53	58	76	93	94
% Schooled up to Lower Secondary					
Malay	2	4	7	45	89
Chinese	7	8	16	44	77
Indian	–	15	18	50	78
% Progressing from Lower Secondary to Completing Upper Secondary					
Malay	20	56	65	60	76
Chinese	58	55	60	62	63
Indian	–	47	65	53	56

Source: Hirschman (2013b).

Table 5.5: Public Expenditure on Education: Malaysia and Selected East Asian Countries

	As % of GDP			As % of total government budget		
	2000	2005	2011	2000	2005	2011
Malaysia	–	4.9	5.6	21.4	21.0 (2004)	20.9
China	5.6	3.3	3.5	11.4 (1999)	–	–
Indonesia	1.3 (1995)	–	–	11.1 (2001)	15.3	15.0
Korea, Rep.	3.2	3.2	3.3	–	–	–
Philippines	3.3	2.3	2.8	15.2	12.4	13.2 (2009)
Singapore	3.9	3.2	3.2	14.8	23.7	20.5
Thailand	3.9	3.5	4.3	27.5	20.2	24.0
Vietnam	2.9 (1995)	–	–	–	–	20.9 (2010)

Sources: ADB (2013) Table 7.5; World Bank Database.

a decade (2007), the number of students enrolled in private institutions had accounted for 42% of total post-secondary enrolment (Cheong, Selvaratnam and Goh, 2011: 166). And in 2010, the private higher education sector accounted for 52.5% (484,377 students) of student enrolment at the tertiary level as against 47.5% (437,420 students) in public institutions of higher learning (Ministry of Higher Education, 2011).

In discussions of human capital development in Malaysia, the area known today as technical and vocational education and training (TVET) has been conspicuous by its absence until recent times. Yet TVET has played major roles in the technological advance of Germany and Korea. As Malaysia aspires for developed country status, what has been the situation in this neglected sector?

National-level data have been hard to come by. Table 5.6 is constructed based on data from UNESCO's Institute for Statistics database. Although the data cover only full-time enrolment and most likely exclude part-time attendees and those participating in short-term training, the numbers enrolled in TVET are small compared with those enrolled in formal academic education. And with an annual growth rate of 3%, it is not gaining on academic secondary education. As noted by Cheong *et al.* (2013: 18-22), the gains made in this sector over the period 2000 to 2010 have been mainly qualitative, involving the achievement of sustained advocacy for TVET to support economic development, provision of incentives for skills upgrading (through the Human Resource Development Fund, HRDF), incorporating industry to foster a more demand driven approach to training, and the institution of training standards and quality assurance.

Assessing Education's Role in Human Capital Deepening

Beyond numbers, however, a number of structural and quality issues pose major challenges. First, as already noted, despite having enrolment and retention rates higher than for males, more than half the females drop out

Table 5.6: Enrolment in Secondary Vocational Education, 1999-2010

	1999	*2003*	*2007*	*2011*	*% growth p.a. 1999-2011*
Total	124,816	138,521	157,812	178,480	3.0
Female	54,350	57,581	68,853	75,780	2.8
% Female	43.5	41.5	43.6	42.4	

Source: UNESCO (2013).

from the labour force, while those who remain are more likely than males to be found in lower-paid jobs or were unemployed (Shyamala *et al.*, 2014: 127). Achieving the MDGs for education is a necessary but not sufficient condition for the productive use of human capital.

Second, despite near universal access, those students from low income households suffer several major disadvantages compared to their better-off peers. A newly completed survey revealed that these students have limited access to government education aid, lack of interest in class cause them to drop out at an early age, education-related expenses, even if defrayed by government subsidies, are a major financial burden for parents, while accessibility issues constrains choice for them (Patel, 2014: 1).

Third, despite the growth of private tertiary education, stakeholders in that sector complain of the absence of a level playing field. They argue that they are viewed through the eyes of public sector institutions, and are benchmarked against them. Before the passage of the 1996 Act, private colleges were not allowed to award higher degrees. And long after 1996, quality assurance applied to private sector institutions continued to be undertaken by assessors from public sector institutions. More than these instances, differences between private and public institutions from objectives to medium of instruction, have sharpened the divide, both perceived and real between them (Hill *et al.*, 2013: 10). Thus, even as, by the numbers, Malaysia has achieved its goal of being an education hub, it is faced with a tertiary education system running along parallel tracks, with little prospect of convergence.

Arguably the most serious challenge to Malaysian education is eroding standards despite high public expenditure. The poor quality of graduates from local universities has become a regular refrain both among employers and in the media (see, for example, Fernandez-Chung *et al.*, 2014; *The Edge Financial Daily*, 2014: 18). To be fair to institutions of higher learning, however, they cannot perform well if the students they recruit have quality problems. The source of university underperformance is to be found in the school system.

The erosion of school standards is manifest from international tests in which Malaysian students participated together with students in many other countries. These are the Trends in International Mathematics and Science Study (TIMSS), conducted every four years[9] and the OECD study Program for International Student Assessment (PISA) conducted in 2009 and 2012. Table 5.7 shows Malaysia's absolute scores, not just rankings, in mathematics and science for grade 8-equivalent students to have

Table 5.7: Malaysia's Test Scores in International Tests TIMSS and PISA, 1999 to 2011

Country/ Skill Tested	TIMSS				PISA	
	1999	*2003*	*2007*	*2011*	*2009*	*2012*
Mathematics						
Malaysia	519	508	474	440	404	421
Korea, Rep.	578	589	597	613	546	554
Singapore	604	605	593	611	562	573
Taiwan	585	585	598	609	543	560
Science						
Malaysia	492	510	471	426	422	420
Korea	549	558	553	560	536	538
Singapore	568	578	567	590	542	551
Taiwan	569	571	561	564	520	523

fallen between 1999 and 2011, dipping below the international average score of 500 by 2007. This stands in sharp contrast to the performance of Singapore and the other newly industrialised economies (NIEs) which is collectively and consistently topping all other countries. The results from PISA are similar. Malaysia's scores are below average and far below those of the NIEs. And as if to underline that higher education spending does not necessarily translate into better results, Vietnam, which just achieved middle-income status, achieved a score of 511 points in mathematics and 528 points in science, the highest in ASEAN except Singapore, and above the OECD average of 494 points <http://gpseducation.oecd.org/CountryProfile?primaryCountry=VNM&treshold=10&topic=PI>. Of the many challenges facing education, this has the most serious implications for human capital deepening and hence the long-term economic development of the country.

If academic education leaves something to be desired, an effective TVET system can still help alleviate deficiencies in the human resource pool. Unfortunately, beyond just small numbers enrolled (see above), Malaysia's TVET system, while much improved over the last decade, suffers from major weaknesses of its own. In a recently completed study for the World Bank, Cheong *et al.*, (2013) concluded that several major challenges emanate from the government's supervision and delivery of TVET programs and from the public attitude towards TVET.

First, unlike in countries like Germany, Korea and Singapore where TVET represents a pathway parallel but not inferior to academic education, the Malaysian public attitude towards TVET is that it is the refuge of those students who cannot make it in academic education. The result is that the TVET system is indeed populated by students of revealed intellectual capability inferior to those in academic education. This attitude is also manifested in the limited availability of data for TVET. While statistics from total enrolment to dropout rates are readily available for academic education, it is extremely difficult to find from government statistics a single data series for TVET participants at the national level, even allowing for the fact that TVET programs vary widely in duration.

This lack of data to provide a broad picture of TVET is partly because organisationally, Malaysia has multiple public agencies engaged in TVET but with limited interagency coordination. This lack of coordination means that even if each agency has improved transparency by releasing data, there is no coordinated effort at data aggregation. More serious than data is the possible overlap of programs and delivery locations although program consistency issues have been addressed through the harmonisation of standards under the National Occupational Skills Standards (NOSS). These have implications for the effectiveness of program supervision as well as the efficiency of program delivery (Cheong *et al*., 2013: 16).

Third, and in terms of the government's role, policy formulation and announcements have not been matched by implementation and its super-vision. As an example, and in addition to the issues already discussed above, measurement of program impact has largely been in terms of the amount of allocations utilised, and, to the extent that output is measured, impact assessments of training beneficiaries beyond employment are still largely absent. Nor was there any evidence that funding and other inputs were linked to targets to be achieved. And even if links could be established, it is impossible to assess the efficiency of funding use (Cheong *et al*., 2013: 15).

Finally, the public-sector focus of TVET allows for limited roles for non-government stakeholders, especially in active labour market programs, and only *ad hoc* attempts have been made to engineer public-private partnerships. Although industry participation in programs offered by public sector institutes has increased to dilute the public sector's supply-driven approach to provision, other stakeholders like workers who are potential beneficiaries have not been consulted. Also left out is the growing number of non-state providers who complained, during a workshop that brought both

public and private providers together, of the government attitude towards them was being primarily one of ensuring regulation and control with no attempt to understand their priorities and operations.[10]

Thus, the TVET sector, though having seen major improvement over the past decade, is burdened by an image problem, and government commitment in which policy formulation is not matched by implementation. And it has as yet too limited a coverage to make a significant contribution to deepening the human resource pool.

As a final point, it has been argued by critics of viewing education solely as a builder of human capital that education has been "commodified" – education as a commodity for which a price is determined by the conjunction of demand and supply – by economists in this age of globalisation (see, for instance, Simpson, 2011). Education, they argue, should simply benefit society by imparting knowledge, i.e. it should be part of human development. This is to an extent true, but in a country bent on economic catch-up to join the ranks of advanced nations, this focus on human capital can hardly be ignored. And even if the objective is human development, the Malaysian education is not delivering.

Concluding Remarks

A review of Malaysia's demographic trends with respect to the size of the potential labour force as a result of the fertility transition reveals an opportunity to strengthen the country's human capital base to move up the development ladder and avoid the "middle-income trap". This opportunity, the demographic dividend, will be lost as the population begins to age.

Malaysia has not fully availed itself of this opportunity. While retention in school and tertiary education represents the right reason for remaining outside the labour force, the low labour force participation of females and their occupational mismatch means that whatever gains in human capital deepening that has been achieved has not been put to effective use for the economy. This also suggests that the assumption of the positive impact of female education (see, for instance, Lutz, 2011: 1) needs to be viewed on a case-by-case basis.

Of the above challenges, that faced by education is the most important, and has consequently been extensively highlighted (Cheong *et al.*, 2013; Lee and Shyamala, 2012; Mukherjee and Wong, 2011; World Bank, 2007, 2013), although with respect to the latter conspicuously not by the government.[11]

Its impact on the country's industrialisation and technology capability is also discussed in greater detail in Chapter 6.

The sources of these weaknesses have also been identified, and have been traced to the country's affirmative action policy that not only sets out to equalise access but also outcomes, as well as the government's mentality of control unaccompanied by public accountability (Cheong, Selvaratnam and Goh, 2011; Lee and Shyamala, 2012; Mukherjee and Wong, 2011). The former downgrades the importance of meritocracy in education while the latter encourages neither transparency nor institutional autonomy. While these and other factors need not be repeated here, the implication of a failure to develop human resources from a compromised education system has dire long-term consequences for a country, whatever its aspirations. The most important of these are the inability to achieve technological catch-up and the progressive deterioration in the quality of institutions (see Chapter 6).

The above challenge is related to the second major development with respect to the demographic transition. This is the immigration (or influx) of migrant labour to fill the gap in labour supply. At a time of rapid growth, such a strategy would have been entirely appropriate, and this model has served Malaysia well (Del Carpio *et al.*, 2013; Hirschman, 2013a). However, instead of viewing this as temporary relief to allow up-skilling of the local workforce, this model has become entrenched, with industry firmly opposed to its removal and the government commitment to curbing the use of low-skill imported labour only lukewarm. This situation, if continued, will compound the impact of a poor education system in retarding economic upgrading.

The Malaysian experience speaks to the fact that the benefits of the demographic dividend will not accrue automatically to a country and its citizens. It must be earned. Government policies are needed to capture these benefits. But they can also lead to these benefits being denied.

Notes

1. Works by Myrdal (1968) and others (in particular Geertz, 1963) set the tone on the negative impact of rapid population growth in developing countries. However, Easterlin (1967) found the evidence of the impact of population on economic growth to be inconclusive, venturing the view that the effect of population growth on economic development might have been in any case exaggerated. Sinding (2009), however, marshalled evidence to support the argument that lower birth rates contributed positively to economic development.

2. This was the title of the book edited by Hill, Tam and Ragayah (2012). The human capital issues features in their discussion.
3. This has led the National Economic Advisory Council, formed by the government to address major impediments to Malaysia becoming a developed country, to lament: "We are not developing talent and what we have is leaving". (NEAC, 2010: 6). Foo (2011) attempted to quantify the extent of brain drain while Harnoss (2011) estimated the economic costs associated with the problem.
4. While the economic factors are the primary drivers of this high outflow overseas, the survey conducted by Foo (2011) showed that the political and social dimensions cannot be ignored.
5. Using demographic data as well as economic data reflecting labour demand, Hirschman (2013a) documented Malaysia's journey from labour surplus in 1970 to labour shortage in 2000.
6. Indonesia has a contiguous border with East Malaysia and is separated from Peninsular Malaysia by the narrow Straits of Melaka. The southern islands of the Philippines are not far from Sabah.
7. Saw (2007: 16) noted that there were an estimated one million illegal immigrants in 2004, 800 thousand of whom were Indonesians. A four-month amnesty saw the departure of 392 thousand illegal migrants.
8. Liberalisation of the private education sector for higher education was part of the government's response to the expanding demand for higher education that could not be met even with the expansion of public higher education (Tan and Santhiram, 2009).
9. TIMSS is an international assessment of mathematics and science achievement of students in the fourth and eighth grades (or their equivalents) in participating countries. It was developed by the International Association for the Evaluation of Educational Achievement. <www.oecd.org/pisa>
10. This was raised at the workshop organised by the World Bank and hosted by the Institute of Strategic and International Studies in Kuala Lumpur on 25 February 2013.
11. The government's Education Blueprint, while recognising the many weaknesses has proposed many remedies. Yet no mention was made of the sources of these weaknesses.

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HUMAN CAPITAL AND INNOVATION OUTPUT IN MALAYSIA'S ECONOMIC DEVELOPMENT

Gopi Krishnan, Santha Chenayah and Rajah Rasiah

Abstract

This chapter examines the impact of human capital and innovation output on economic development using Malaysia as an example. The evidence shows that Malaysia's economic growth among the upper middle-income countries has been driven considerably by resource exports. Like most upper middle-income countries, Malaysia has not demonstrated strong human capital and innovation output relative to countries classified as high-income countries. Malaysia's share of R&D scientists and engineers per million persons fell significantly short of South Korea, Taiwan and Singapore, which to a large extent explains why it has not followed the growth trajectory of the latter countries to become developed. Also, not only is GDP growth driven strongly by labour inputs, there is no relationship between innovation output and GDP growth. The evidence suggests that efforts must be taken to raise the quality of human capital produced in the country, and to attract more vigorously Malaysians carrying tacit and experiential knowledge from abroad to lead critical human capital producing organisations.

Introduction

For a number of decades Malaysia was heralded as a model of economic development for other countries to emulate (World Bank, 1993). Since the late 1990s, however, the onset of premature deindustrialisation has cast a different light on the Malaysian experience. While some economists have

focused on a rapidly cooling manufacturing sector others have pointed to the lack of human capital as the prime reason for the slowdown.

The aggressive promotion of export processing zones since 1972 assisted industrialisation to stimulate structural change in Malaysia with manufacturing overtaking agriculture to become Malaysia's leading sectoral contributor to GDP since 1984 (Malaysia, 2001). Foreign direct investment (FDI) helped make Malaysia a major exporter of the light manufactured goods of electronics and clothing since the 1980s. Domestic firms became the prime driver of processed vegetable oils and fats exports from the 1980s.

Massive inflows of FDI into the manufacturing sector also caused serious tightening of the labour market by the mid-1990s (Ariff, 1991; Rasiah, 1995). The focus of industrial policy shifted towards industrial deepening as the government attempted to take advantage of low unemployment levels (which reached 2.7% in 1995) to stimulate structural change into high value-added activities. Following the introduction of the Way Forward initiative in 1991, the government targeted institutional change at making Malaysia a developed nation by 2020. A series of instruments were introduced to promote industrial deepening through the Action Plan for Industrial Technology Development (APITD) of 1990 (Malaysia, 1991).

Unfortunately, weaknesses in implementation restricted Malaysia's capacity to stimulate structural change from low to high value-added activities. The most fundamental shortcoming is the inability of the government to produce productive human capital from the expansion in tertiary education and to make its brain-gain program successful in attracting its diaspora embodied with tacit knowledge from abroad. The growing shortage of human capital since 1990 forced firms to import foreign labour. Unfortunately, the prime target of firms to sustain their operations was low skilled labour, which aggravated the situation by reducing the pressure to upgrade (Rasiah, 1995; Henderson and Phillips, 2007). Hence, while South Korea, Taiwan and Singapore have successfully evolved a critical mass of human capital to spearhead structural change from low to high value-added activities, Malaysia has remained entrenched among the upper middle-income countries.

While human capital is a key driver of economic growth and productivity improvements, attempts to examine the link between them unavoidably also requires an assessment of innovation indicators as the latter also has a strong bearing on long run growth. Some innovation indicators relate to human capital, e.g. the share of R&D personnel in the population,

whilst others are the output of human capital, e.g. scientific publications and patents. Hence, we also include in this chapter the impact of innovation output on GDP growth.

This chapter seeks to examine the contribution of human capital to Malaysia's economic development. The rest of the chapter is organised as follows. The next section discusses the main theoretical arguments on human capital and economic growth while the following section presents the methodology and data used in the chapter. The subsequent section examines the relationship between human capital and economic growth in Malaysia relative to other upper middle-income countries followed by the next section which examines the relationship between human capital and innovation output, and economic development. The penultimate section analyses the impact of changes in tertiary education on economic growth. The final section concludes the chapter with some discussions on policy implications.

Literature Review

The role of human capital and innovation systems in economic development has been discussed by a wide range of scholars. The dominant mainstream approach has its roots in Solow's (1956) neoclassical production function model. This approach assumed greater significance following attempts by Romer (1986) and Lucas (1988) to differentiate capital and labour so as to endogenise the influence of technology on economic growth. Whereas in the original Solow model the residual included both productivity and technology, the Solow-Romer model is considered to have reduced the residual term to total factor productivity as human capital and machinery and equipment are introduced as production inputs.

Using the neoclassical framework, Barro (2001) found in a sample of 100 countries over the period 1965-95 human capital to have influenced positively economic growth. Engelbrecht (2003) found the same results in a sample of Organisation of Economic Cooperation and Development (OECD) countries. Meanwhile, Jorgenson and Fraumeni (1992) found 61% of GDP growth of the United States was accounted by human capital over the period 1948-86. Using the year 1985 data for 98 countries, Mankiw *et al.* (1992) found that human capital explained 49% of the variation in the economic growth of these countries. However, Hall and Jones (1999) found that human capital accounted for only 22% of the variation in economic growth of 127 countries in 1988.

The development of the neoclassical framework for estimating the contribution of labour (including human capital), capital and total productivity to economic growth has been a significant contribution to our understanding of growth dynamics. However, this framework does not take account of phases in economic development, and in that sense, is not consistent with the concept of the incremental capital output ratio (ICOR) advanced by Harrod (1939) and Domar (1948). The latter considers higher ICORs as essential for the less developed economies compared to the more developed economies as they face serious underemployment of resources.

The neoclassical framework also does not take into account the quality of human capital involved. By focusing on markets the approach discourages active state intervention by claiming that markets would adjust supply responses with demand to ensure demand–supply equilibrium. While the market clearing argument helps reduce the probability of shortfalls between supply and demand because human capital is easily prone to market failure – long gestation period involved and inability to judge the potential *ex ante* employment opportunities, and the fact that humans can also consciously seek to underperform if better options arise elsewhere. Hence, economies such as Japan, South Korea and Taiwan launched deliberate human capital development policies to spearhead structural transformation and economic growth. Large numbers of South Korean and Taiwanese graduates remained to work in the United States in the early part of their careers because their own home countries did not have the demand for such qualifications until the 1970s and 1980s. The experiential knowledge gained working in the United States was to play a major role in the technological catch up of several firms in these countries in the 1980s and 1990s (Kim, 1997; Rasiah and Lin, 2005; Rasiah *et al.*, 2015).

Vogel (1991) had discussed at length national policies introduced by the governments of Japan, South Korea and Taiwan to expand the supply of upper secondary and tertiary, and technically qualified personnel with a strong focus on science and technology disciplines. Saxenian (2006) advanced this further, citing the efforts of these governments to attract back from the developed countries citizens embodied with experiential and tacit knowledge. Rasiah *et al.* (2015) discussed how Taiwan and India pursued different approaches and yet managed to attract back their national human capital to support technological catch up at home, and why Malaysia's efforts did not go far because of ethnic based policies. Several others have documented evidence of how the return of the diaspora helped support

technological catch up in key high technology industries in South Korea and Taiwan (see Song, Almeida and Wu, 2003; Lin and Rasiah, 2014).

There are also extensive works that examine the relationship between innovation output (including science and technology) and economic growth with some components having an overlapping link with human capital but with most focusing on the developed economies (see Rosenberg, 1974; Fagerberg, 1994; Von Tunzelman, 1995). For example, Fagerberg and Verspagen (1996) argued that R&D effort and investment have created a diverging GDP structure and unemployment in the European Union with the emergence of at least three different "growth clubs" characterised by different growth spends, productivity and unemployment levels. Los and Verspagen (2000) found R&D spill-overs to have significant positive effects on productivity, though, their magnitudes differ between high-tech, medium-tech and low-tech firms. Fagerberg and Verspagen (1996) attempted to frame an evolutionary model to examine the contribution of R&D intensity to economic growth among the developed economies and found that there were several divergent groups emerging.

Among developing countries, Wong and Goh (2010a, 2010b) used a self-propagating model to show that the relatively low innovation output of Malaysia has translated little to economic growth, while the high innovation output has contributed strongly to economic growth in Japan and Korea. They found technological advancement relatively low and static in Malaysia compared to Japan, Korea and Taiwan, despite the strong growth in science.

Since South Korea, Taiwan and India have been classified as successful countries in the way their governments organised their human capital and innovation policies and they are well documented we focus on Malaysia in this chapter as it embarked on efforts to catch up with the East Asian economies following the launching of the Look East policy in 1981 (Malaysia, 1981). We have chosen Malaysia, an upper middle-income country, to examine the influence of human capital on the country's economic growth, and the impact of Malaysia's tertiary education policies.

Methodology and Data

The role of human capital and innovation in influencing economic growth is well studied by neoclassical and evolutionary scholars albeit using different methodologies. This chapter seeks to identify human capital and innovation factors influencing economic growth in Malaysia using

aggregated macro data. The scope of the analysis is divided into two areas. Firstly, the comparison is made between Malaysia's human capital level and innovation capabilities against the peers. For this, we use descriptive statistics of innovation inputs, innovation outputs and economic progress, using annual data from the *World Development Indicators* (*WDI*) provided by the World Bank for the period 1996 to 2011. The countries are grouped based on income level, classified according to the World Bank Atlas Method.

The comparative study will allow us to locate Malaysia's position in human capital and innovation policies in perspective against the efforts of other nations with similar income levels. Malaysia has progressed well in the past, from an agrarian economy during the early independent days to a modern economy now. The nation is envisaged to become a high-income economy by 2020. However, the critics of Malaysia in the past have highlighted the lack of quality human capital as the major obstacle to the investment climate and economic growth (World Bank, 2010). This contradicts with the labour market data which suggest the share of labour force with tertiary qualification has increased from 11.9% in 1982 to 24.7% in 2013 (see Figure 6.1). Furthermore, R&D researchers and R&D expenditure as a share of GDP has also been increasing. For example, R&D researchers (per million people) increased from 89.1 in 1996 to 346.6 in 2006 while R&D expenditure as a share of GDP increased to 1.1% in 2010 from a meagre 0.2% in 1996 (Gopi and Chandran, 2014). These figures fall

Figure 6.1: The Share of Labour Force by Educational Attainment, Malaysia, 1982-2013
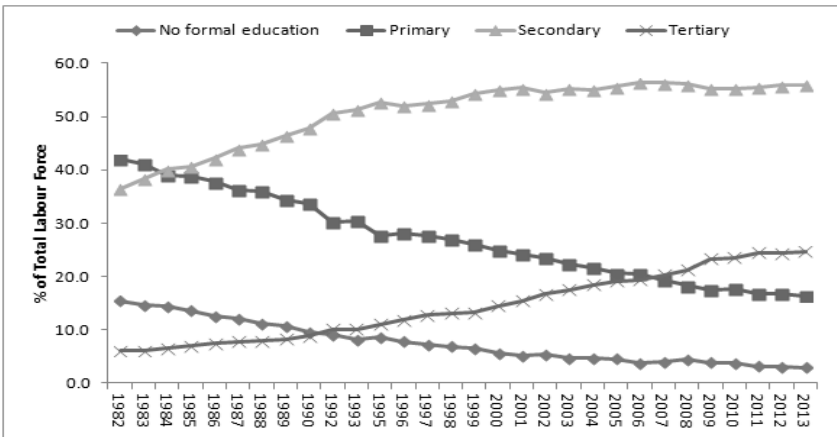
Source: Computed from Department of Statistics, Malaysia.

significantly lower than the commensurate figures of South Korea, Taiwan, Singapore and China.

Secondly, this chapter seeks to analyse the econometric relationship between human capital and innovation factors on the one hand and per capita income on the other hand. We ran human capital and innovation output model separately as these factors are expected to exhibit serious multicollinerity problems. The methodology combines both neoclassical and evolutionary approaches. Our theoretical framework is built upon a modified Cobb-Douglas production function, but unlike the neoclassical approach, which use total factor productivity (TFP), we have regressed GDP per capita directly against the human capital and innovation factors. We ignore TFP in our analysis as some critics have asserted that it failed to explain economic growth and its effects are often misleading (Nelson, 1964).

The data are compiled from the Department of Statistics, Malaysia and the World Bank's *World Development Indicators* (*WDI*) for the period of 1988 to 2011. The variables used in the regression are explained in Table 6.1.

Table 6.1: Specification of Variables

Variables	*Explanations*
GDPcap	Gross domestic product (GDP) per capita (constant 2005 US$)
Cap/Lab (C/L) ratio	Gross fixed capital formation to labour force ratio
Skilled	Labour force with tertiary education
Unskilled	Labour force with no formal education, primary education and secondary education
Hexp	High technology exports (% of manufactured exports)
Agrfuel	Agricultural raw material exports and fuel exports (% of merchandise exports)
Patent	No. of patent applications
SCI	Scientific and technical journal articles[1]
TM	Total no. of trademarks registered[2]
Rece	Recession dummy: 0 for normal period and 1 for recession period
ln	Natural logarithm

Notes: [1] Classified by the Institute for Scientific Information's Science Citation Index (SCI) and Social Sciences Citation Index (SSCI).

[2] Data includes applications filed by direct residents (domestic applicants filing directly at a given national or regional intellectual property [IP] office); direct non-resident (foreign applicants filing directly at a given national or regional IP office); aggregate direct (applicants not identified as direct resident or direct non-resident by the national or regional office); and Madrid (designations received by the national or regional IP office based on international applications filed via the World Intellectual Property Organization-administered Madrid System).

Time series and cross-sectional regressions are exposed to the risk of spurious regression (Engel and Granger, 1987). Since we are using time series data, first we conduct a unit root test for the individual variables to check for the stationarity of the data. We propose using the Augmented Dickey-Fuller (ADF) test to find out if there is a need to differentiate time series data to make it stationary. Further, diagnostic tests for multi-collinearity, heteroskedasticity and serial correlation test were conducted to check the robustness of the regression output prior to making inferences from the results.

Human Capital and Innovation: Where does Malaysia Stand?

The role of human capital in developing innovation capabilities is well documented in the past. For this study, we use R&D personnel and tertiary enrolment as a proxy to explain human capital. Table 6.2 shows that the mean of R&D personnel and tertiary enrolment is higher in the high-income than in the upper middle-income countries. While Malaysia is classified as an upper middle-income nation, the mean of R&D personnel and tertiary enrolment is lower than comparable countries. As a result, its innovation outputs (i.e. scientific journal articles, trademark and patent application) are lower than the mean of the upper middle-income countries.

Malaysia spent more resources on R&D activities than its peers, but the effectiveness of R&D spending remains uncertain. The data suggest that weakness in human capital development may explain the ineffectiveness of R&D spending. This finding is consistent with other studies on Malaysia. Rasiah (2011) found a lack of connection between firms and organisations entrusted with knowledge creation, thereby affecting firm performance negatively. Hence, spending on R&D activities alone does not guarantee higher innovation output, especially when the economy is lacking in human capital support to drive innovation activities.

The relationship between human capital and economic development is well established by both neoclassical and evolutionary scholars. An economy with stronger human capital development tends to have higher income growth. Figures 6.2 and 6.3 show this positive relationship for both upper middle-income countries and high-income OECD countries. However, the slope of the regression trend line differs markedly between these two groups of countries. The role of R&D personnel in explaining GNI growth is much weaker in the upper middle-income countries compared to the high-income

Table 6.2: Descriptive Statistics, Innovation Input, Innovation Output and Economic Progress, 1996-2010

	Innovation Input			Innovation Output			Economic Progress
	RDP	TERTIARY	RDEX	SCI	TM	PAT	GNI
Upper Middle Income							
Mean	793.2	34.4	0.6	6092	81922	12761	4699
Median	737.3	31.1	0.5	1545	19790	682	3993
Maximum	2131.1	67.6	1.8	89894	1388399	415829	10806
Minimum	71.7	5.1	0.1	34	2873	2	834
Std. Dev.	521.3	15.5	0.3	14739	198238	51650	2417
High Income OECD							
Mean	3516.2	62.9	1.9	18378	40775	29845	27730
Median	3154.3	61.7	1.8	5133	17754	1972	25310
Maximum	8003.5	101.8	4.1	209898	304129	384201	86850
Minimum	1144.6	20.1	0.5	143	2095	18	3760
Std. Dev.	1609.5	15.3	0.9	35696	52732	79829	15492
Malaysia							
Mean	706.0	30.7	0.7	962	22247	681	5367
Median	499.5	30.0	0.7	724	24049	531	5588
Maximum	1642.7	37.1	1.1	2092	28833	1234	6364
Minimum	152.8	21.8	0.4	387	14876	193	4176
Std. Dev.	548.3	5.3	0.3	596	4788	422	792

Note: RDP – Researchers in R&D (per million people); Tertiary – Enrolment in institution of higher learning (% gross); RDEX – Research and development expenditure (% of GDP); SCI – Scientific and technical journal articles; TM – Total trademarks; PAT – Patent applications by residents; GNI – GNI per capita (Atlas Method US$).

Source: Computed from World Bank (2013).

Figure 6.2: Upper Middle-income – Relationship between R&D Personnel and GNI per Capita

Figure 6.3: High-income OECD – Relationship between R&D Personnel and GNI per Capita
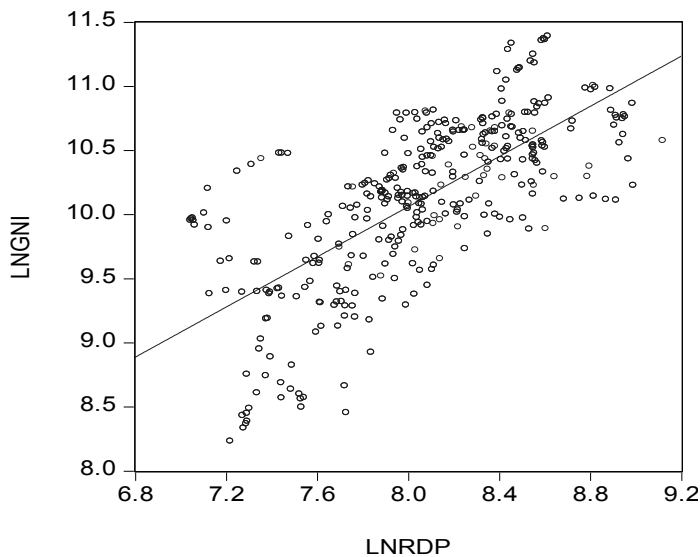
countries. This is reflected by an almost flat regression line in upper middle-income countries compared to a strong positive relationship between human capital and income growth in the high-income countries. Hence, income growth in upper middle-income countries could occur despite the weaker human capital position, but human capital development is essential for income growth in high-income economies. This could explain why Malaysia still has enjoyed a higher GNI per capita mean income compared to the upper middle-income average despite having a weaker human capital and innovation performance (see Table 6.2). We therefore suggest the income growth could be driven by non-innovative economic activities, e.g. mining and quarrying and traditional agricultural activities as global commodity prices strengthen.

Scientific output reflects the effectiveness of human capital development and other forms of innovation input. A larger number of innovation inputs do not necessarily translate into higher innovation outputs, especially when the quality of inputs is low and the resource allocation to develop innovation capabilities may not be targeted correctly due to policy failure.

Hence, income growth is not only a function of innovation input (human capital) but also the role of innovation output (scientific output). Countries with a balance of both tend to enjoy greater economic benefits. Figure 6.4 shows that high-income economies tend to have both human capital and scientific output.

In the case of Malaysia, the ratio of scientific output over R&D personnel is very low. In fact, the ratio resembles that of countries in the lower middle-income group compared to its current position as an upper middle-income nation. This ratio must be substantially raised if Malaysia is to achieve its goal of becoming a high-income nation by 2020. The present condition of its human capital and scientific output is not encouraging. Hence, Malaysia's policymakers have to revisit human capital and innovation policy to ensure the country's progression to become a high-income nation by 2020 is a reality.

Human Capital, Innovation Output and Economic Progress in Malaysia

As discussed earlier, innovation inputs in Malaysia are lower compared to the commensurate inputs of similar upper middle-income economies, which consequently explains why innovation output in Malaysia is lower than

Figure 6.4: Scientific Outputs/R&D Personnel Ratio and GNI per Capita, 2010
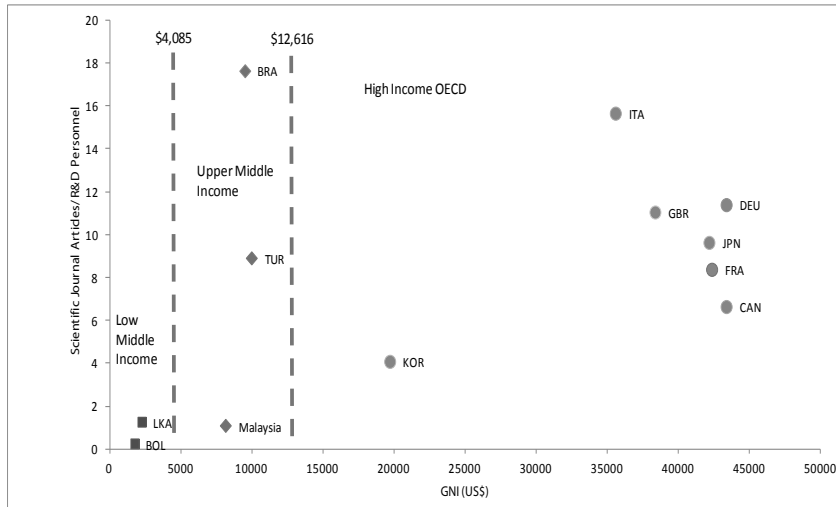
Note: BOL (Bolivia), LKA (Sri Lanka), BRA (Brazil), CHN (China), MYS (Malaysia), TUR (Turkey), BEL (Belgium), CAN (Cananda), FRA (France), DEU (Germany), ITA (Italy), JPN (Japan), KOR (Korea, Rep) GBR (United Kingdom).

Source: Computed from World Bank (2013).

other countries in the same income group. Having established that fact, we attempt here to analyse econometrically the elasticity of human capital and innovation against GDP per capita. We hypothesise that a strong positive relationship exists between i) human capital and economic progress, and ii) innovation output and economic progress.

We start the analysis by testing for stationarity using the Augmented Dickey-Fuller test. The result shows that all variables are non-stationary, and hence the null hypothesis was rejected. Once the data was first differenced, all variables became stationary (Table 6.3).

Accordingly, the regression model was transformed using data that was first differenced to solve the problem of non-stationarity. Thus, the models were obtained:

Model 1:

$$\Delta lnGDPcap_t = \alpha_i + \beta_1\Delta lnC/L_t + \beta_2\Delta lnSkilled_t + \beta_3\Delta lnUnskilled_t + \beta_4\Delta lnHexp_t + \beta_5\Delta lnAgrfuel_t + \beta_6Rece_t + \varepsilon_t$$

Table 6.3: Unit Root Tests of Variables

	ADF (Null Hypothesis H_0: Has a Unit Root)	
	Level	*First Difference*
lnGDPcap	-1.868	-4.373***
lnC/L	-2.311	-3.811***
lnSkilled	-0.044	-4.434***
lnUnskilled	-1.731	-5.742***
lnHexp	-1.341	-5.046***
lnAgrfuel	0.095	-5.289***
lnSCI	2.587	-3.803***
lnTM	-1.472	-5.724***
lnPatent	-1.571	-6.221***

Note: (***) allows rejection of the unit root null hypothesis at 1%.
Source: Computed using data collected from World Bank (2013).

Model 2:

$$\Delta lnGDPcap_t = \alpha_i + \beta_1 \Delta lnC/L_t + \beta_2 \Delta lnPatent_t + \beta_3 \Delta lnSci_t + \beta_4 \Delta lnTM_t + \beta_5 Rece_t + \varepsilon_t$$

where Δ refers to changes $(t_1 - t_0)$

The regression results are shown in Table 6.4. The coefficient of all independent variables except for the recession dummy explained the short-run elasticity of the model. Model 1 focuses on human capital factors while Model 2 focuses on innovation output factors. Model 1 confirms the lack of statistical relationship between skilled labour force and GDP per capita. One of the reasons for the lack of relationship could be a consequence of the small share of tertiary graduates in the labour force. The majority of the Malaysian workforce have only completed up to secondary school (see Figure 6.1). Tertiary education enrolment in Malaysia was 36.0% in 2011, which was significantly lower than the 94.3% recorded by the United States in the same year (World Bank, 2014).

The negative coefficient is similar to that found by Benhabib and Spiegel (1994). However, instead of testing human capital on TFP as suggested by Benhabib and Spiegel, we estimate Model 2 by regressing GDP per capita on innovation output. If there exists a significant relationship between GDP per capita and innovation, it would be worth estimating using a simultaneous

Table 6.4: Statistical Relationship between Human Capital, Innovation Output and Economic Growth

	Ordinary Least Square (OLS)	
	Model (1) ΔlnGDPcap	Model (2) ΔlnGDPcap
ΔInC/L	0.168***	0.143***
ΔInSkilled	-0.077	
ΔInUnskilled	0.458**	
ΔInHexp	0.062	
ΔInAgrfuel	0.045*	
ΔInPatent		0.005
ΔInSci		-0.013
ΔInTM		0.068
Rece	-0.016	-0.013
constant	0.026**	0.03***
R^2	0.891	0.803
Adjusted R^2	0.851	0.746
F-stats	21.939***	13.896***

Note: (***), (**) and (*) refers to significance levels at 1%, 5% and 10% levels, respectively.
Source: Computed from data collected from World Bank (2013).

equation model to confirm if there is an indirect relationship between skilled labour force and GDP per capita. However, Model 2 shows no significant relationship between innovation output and GDP per capita, and hence there is no need for the simultaneous equation model. Although the explanatory power (R^2 and adjusted R^2) of Models 1 and 2 are affected by the small number of observations, they are still important as they are high.

The coefficient of the capital to labour ratio variable for both models is below 1 and is positive and significant, confirming that Malaysia is reliant on labour intensive inputs to expand GDP per capita. Furthermore, GDP per capita also exhibits a positive and significant relationship with unskilled labour force. A 1% increase in the unskilled labour force will raise GDP per capita by 0.5% in the short-run. The large influx of unskilled foreign labour may also explain this paradoxical finding. Indeed, Tham and Liew (2004) found that foreign labour was inversely correlated with total factor productivity in Malaysia. Also, Rasiah, Crinis and Lee (2015) found the clothing industry, which is one of the key export-oriented industries in Malaysia, is heavily dominated by unskilled foreign labour.

As mentioned earlier, Malaysia enjoys relatively high GNI per capita despite having weak human capital and innovation output. We argue that this may be due to higher production of low innovation activities, such as raw agricultural and fuel exports. Model 1 shows that while the coefficient of high-technology exports has a positive sign, its relationship with GDP per capita is not statistically significant. Conversely, agricultural and fuel exports are positively and significantly correlated with GDP per capita, which confirms our argument that the increase in GNI per capita in Malaysia could be largely driven by less innovative activities.

All necessary diagnostic tests were conducted to check the robustness of the estimated models. First, we performed normality tests using the Jarque-Bera (1980) analysis. Models 1 and 2 confirm that the data is normally distributed with the acceptance of the null hypothesis. The results show no multicollinearity as all the variance inflation factors (VIF) are below 10, indicating the absence of an endogenity problem between the independent variables. To fulfil the white noise assumption, the variance of the model should be constant. The Breusch-Pagan-Godfrey heteroskedasticity test applied to both models confirms that there is no heteroskedasticity problem. Finally, the Lagrange Multiplier (LM) test found no serial correlation in both models.

This study has a number of limitations. Firstly, the econometric analysis is constrained by small sample size due to limited historical data on human capital and innovation output in Malaysia. Secondly, the variable representing innovation output is also limited by the availability of the data. The study does not capture the impact from incremental innovation which may influence the growth of GDP per capita. Nonetheless, the results still provide useful information for drawing policy implications. Besides, the results confirm the view widely held that Malaysia is still lacking in human capital and innovation compared to other upper middle-income economies. Further we found that human capital and innovation are more important in high-income countries than in upper middle-income countries. Hence, to achieve growth after attaining the status of a high-income economy, Malaysia should seriously reassess its innovation and human capital performance to enable the country to progress in a more sustainable and robust manner.

Changes in Tertiary Education and Economic Growth

Education is often perceived as one of the most important determinants of economic growth. However, recent evidence reveals that the relationship between education and economic growth is negative (see, for instance,

Mankiw *et al.*, 1992; Pritchet, 2001; and Benhabib and Spiegel, 1994). The negative result might be due to data issues and schooling variables as Fuente and Domenech (2000) have argued. Atkinson and Brandolini (2001) also posited that the choice of data might influence conclusions, especially when the study involved a time dimension.

Malaysia has been impressive in its public spending on education (Cheong *et al.*, 2011). Table 6.5 shows that Malaysia's expenditure significantly focuses on tertiary education. Between two development plans (Seventh and Eight Malaysia Plans), expenditure for tertiary education grew over one and a half times. Between 8MP and 9MP, Malaysia's spending on tertiary education was 81% of per capita GDP, much higher than other Asian countries, including Singapore and South Korea (Cheong *et al.*, 2011). This clearly show that the heavy investment in education has produced little result.

Conclusions

Malaysia has developed strongly enough to become an upper middle-income country with manufacturing becoming the prime exporter since the 1980s. However, natural resources, such as oil and gas, and oil palm not only initiated the country's economic growth till the early 1970s, they have become important again in the country's rapid growth since the late 1990s. However, growth has slowed down in trend terms since the Asian

Table 6.5: Education Development Expenditure, Seventh and Eight Malaysia Plans, 1996-2005 (RM million)

Level	*Seventh Plan* *1996-2000*	*Eight Plan* *2001-2005*	*Ninth Plan* *2006-2010*[c]	*% Change*	
				7P – 8P	*8P – 9P*
Primary[a]	2,739	5,585	5,645	+103.9	+1.1
Secondary	5,318	8,748	6,793	+64.5	-22.4
Tertiary	5,005	13,404	16,069	+167.8	+19.9
Other[b]	4,480	10,185	11,849	+127.3	+16.3
Total	17,542	37,922	40,356	+116.2	+6.4

Notes: [a] Includes preschool.
[b] Consists of teacher education and other education support programmes.
[c] Allocation only.
Source: Adapted from Cheong, Viswanathan and Goh (2011).

financial crisis struck in 1997-98. Malaysia's progress has since fallen below the growth trajectory required for the country to achieve developed status by 2020. Human capital has been identified as the key deficiency that has restricted Malaysia's capacity to sustain rapid growth and structural change to high value-added activities (Malaysia, 2010).

Statistical evidence supports the above argument as the coefficient of the capital to labour ratio in our estimated models was below 1 and was positively significant suggesting that GDP per capita growth is driven by greater reliance on labour than on capital. The results also shows that GDP per capita rose by 0.5% for every 1% increase in unskilled labour. Also, there has been no significant relationship between innovation output and GDP per capita in the Malaysian case. These results merely reinforce Rasiah's (2011) argument that Malaysia is experiencing premature deindustrialisation.

Although Malaysia invested heavily in education compared to other countries, the share of enrolment in technical education was well below that for Korea, Taiwan, Singapore, China, India and Indonesia. Similarly, Malaysia had a significantly lower ratio of R&D scientists and engineers per million population than Korea, Singapore, Taiwan and China. Little wonder that Malaysia ranked low in scientific output and patents taken in the United States when compared to Korea, Taiwan, China and Singapore.

Malaysia has enjoyed higher GNI per capita compared to the upper middle-income country average despite having a weaker human capital base, innovation and scientific publications performance, suggesting that the country's income growth has been driven strongly by non-innovative economic activities such as mining and quarrying, and oil palm. These results suggest that serious efforts must be made to review Malaysia's human resource policies. While investment is necessary the prime deficiency appears to come from the quality of human capital produced in the country, which may explain why the country's innovation output has lagged significantly below those of South Korea, Taiwan and Singapore. Also, while the infusion of quality is pertinent in the country's educational establishments, more vigorous efforts must be made to attract Malaysians from abroad with tacit and experiential knowledge to return and lead the organisations producing human capital, and spearheading technological catch up.

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7

TOWARDS EFFECTIVE EDUCATION PLANNING IN MALAYSIA: NEGOTIATING TENSIONS AND CONFRONTING CHALLENGES*

Dzulkifli Abdul Razak

Introduction: From Malthus to the "Behavioural Sink"

In 1798, Thomas Malthus (1798: 14) in his *An Essay on the Principle of Population* opined that human population would grow exponentially while food production would only grow at an arithmetic rate. The implication was that rapid population growth would lead to food shortages and diminished economic wellbeing.

This theory has, as is well known, been discredited as, like everything else, technology has improved productivity so much that today's population has access not only to more but also better food. This has been the basis for the conventional wisdom that Malthusian theory is dead and buried.

But has it? In 1962 John Calhoun reported on his use of a colony of mice which is allowed to multiply until the colony is pressed against the limit of "space" – designed to be the only limiting frontier, in what he dubbed as an experimental utopian place called Universe (Calhoun, 1962). After more than 500 days of experimentation, drastic behavioural changes were observed where some male mice stopped defending their territory, while others grouped and turned aggressive sporadically. Similarly, the females started to attack their own young, and even stopped reproducing. The number of deaths rose as the aggressive behaviour got worse, regardless of gender and relations, leading to cannibalism. This

tipping over into irreversible societal collapse he termed "the behavioural sink", where the change of behaviour becomes the new norm following the population growth of mice in Calhoun's experiment. It sounded like Malthus reborn.[1]

Those who found solace in that human beings are not rats should find little comfort in that the United Nations, in the person of Secretary-General Ban Ki-Moon, was quoted as saying, albeit with some nuance, that he suspected the 7 billionth citizen would face "a world of contradiction – plenty of food, but still a billion people going to bed hungry every night. Many people enjoy luxurious lifestyles, but still many people are impoverished" (UPI, 2011). Secretary-General Ban is not alone (see, for instance, Fornos, 1998; Villarreal and Stoukal, 2005; Young, 2005).

What has over-population to do with education planning? Without subscribing to the above doomsday theses, it is argued here that a larger population renders the need for planning basic needs and social services much more challenging, given the need to allocate scarce resources efficiently. In this age of technologically driven growth, the role of human capital, which education provides, is critical. At the same time, it is easy to forget, and indeed, many including governments have forgotten, that the purpose of education is not just to provide human capital but to enrich the lives of a country's citizens.

This narrative is clearly relevant for Malaysia, which, despite declining fertility leading to ageing, still has a youthful population. Globalisation – and Malaysia is one of the most globalised in the world if measured by the trade to GDP ratio – has also brought competition to the country's doorstep.[2] Malaysia's population will need to adjust and respond to this new reality. This is why educational planning merits particular attention. The purpose of this chapter is not to elaborate on the specific substance and techniques of education planning but to indicate broad directions as well as challenges that need explicitly to be dealt with in developing planning that is appropriate to the new priorities.

This chapter is structured as follows. In the next section, Malaysia's education philosophy is briefly described. How operationalising this philosophy needs to reconcile a number of tensions is the subject of the following section. It also needs to confront major concerns listed in the penultimate section. The final section brings all the discussions together to suggest directions for a new paradigm in education planning that captures the priorities for ensuring Malaysia's future development.

Malaysia's Education Philosophy

However education planning is defined, it has to be done within the framework set by the country's education philosophy. This was framed by the National Philosophy of Education (NPE) or *Falsafah Pendidikan Kebangsaan* (FPK) as early as 1966. This was stated as follows:

> Education in Malaysia is an on-going effort towards further developing the potential of individuals in a holistic and integrated manner, in order to produce individuals who are intellectually, spiritually, emotionally and physically, balanced and harmoniously, based on a firm belief in and devotion to God.
>
> Such an effort is designed to produce Malaysian citizens who are knowledgeable and competent, who possess high moral standards and who are responsible and capable of achieving a high level of personal well being to contribute to the betterment of the nation, family and society.
>
> (http://teachinginmalaysia.blogspot.com/2011/02/malaysia-national-education-philosophy.html – accessed on 4 January 2015)

This philosophy clearly emphasises values, beliefs and attitudes in directing education policy be it for the individual or the family and the community as a whole. The role of education has been perceived to embrace a wide societal space to encompass the provision of a range of social benefits. Research has also shown that educational equity, through upward social mobility, is an important contributor to income equity, and vice versa. Hence, the more equitable is the access to educational opportunities, the greater is the role of education in reducing income inequities and combating poverty.

In other words, through NPE individuals are not only to be endowed with the relevant skill sets but also have the right mind sets to use them. This in turn can create a more harmonious and balanced community that are acutely conscious of their role in society. It can be taken to mean that the learning experiences undergone by each individual are reinforced by cooperative behaviours, like teamwork and self-discipline that go a long way to safeguarding the values espoused by NPE. It is therefore crucial to ascertain to what extent this can be enhanced by putting in place not just the appropriate educational planning processes but also taking into account how they are to be implemented.

Implementation has taken the form of a succession of education strategies, plans and policies. These policies have themselves undergone major changes to reflect changes in the education landscape. Thus there was a

shift in focus from basic education – the 3R's (reading, 'riting and 'rithmetic), with a Malaysian-oriented curriculum – in the 1960s to developing a "world-class" education system in the 1990s (Hussaini, 2013). Through these changes, how much of the NPE has remained intact is the overarching question.

Specifically, has sufficient efforts been made to correctly balance the four "domains" of physical, intellect, emotional and spiritualism (PIES) as stipulated in the NPE; or to put it another way how balanced are these efforts in the quest to nurture a balanced and harmonic human persona (*insan*) as envisaged by the NPE. The expectation is that the more balanced and well-rounded the person is, the better he or she can cope with the growing and changing demands the world makes today. It is crucial to underline this aspect given the apparent tensions that exist between the four domains of PIES. Unless these tensions are explicitly taken into account, education planning effectiveness runs the risk of being undermined.

From Philosophy to Planning: Negotiating Tensions

What might the tensions be? One is the tensions exerted between the forces of "globalisation/internationalisation" and that of "localisation/regionalisation" in terms of values, norms and also relevance that collectively can give conflicting outcomes on the individuals. As it stands today, the general trend is to focus more on the issues related to globalisation and internationalisation and less so on local or even regional issues, for example in determining standards and quality concepts. The all-pervasive term "world-class" – generally understood – has at once marginalised local understanding of standards and quality concepts since it does not conform to the dominant viewpoint of the more developed economies with the values and norms that support it. In higher education, universities are evaluated mainly based on their economic impact or contribution to the economy, and less on issues of social justice, equitable access and success which co-incidentally are no longer of major concerns in many developed economies, but remain concerns for developing nations.

Another tension has elitism pitted against equitable access.[3] Focus on the former would benefit the few rather than the many. This is part of the broader concern about social inequality globally. In the Malaysian context, the move has been from elitism towards greater access at both school and higher education levels. At schools, the drive towards universal coverage has still left vulnerable groups, especially the poor, behind (Patel, 2014). At the

tertiary education level, this was achieved through both the expansion of public institutions of higher learning and the liberalisation of private higher education (Tan and Santhiram, 2009). With the liberalisation of private education, enrolment ratio in these institutions tripled from about 12% in 1996 to 36% in 2011 (World Bank, 2014). This strategy, though laudable has also some undesirable consequences, chief among them being the emergence of two non-converging education tracks divided along ethnic and linguistic lines (Tan and Santhiram, 2009: 9).

Similar tension exists over the imbalance between intellectual and spiritual dimensions although the latter is predicated in the principle "*Belief in God*" as stipulated in the philosophy of education. This becomes even clearer from the way education is currently being measured and promoted in terms of production of "human capital." This is no better articulated than by Fitzsimons (1999): "[i]n modern Human Capital Theory all human behaviour is based on the economic self-interest of individuals operating within freely competitive markets. Other forms of behaviour are excluded or treated as distortions of the model". This concept is not aligned to NPE. Some of the keywords used in NPE such as "holistic", "possess high moral standards", and "capable of achieving high level of personal wellbeing as well as being able to contribute to the harmony and betterment of the family, society and nation at large" categorically single out the importance of such "intangibles" as part of the ethos of education. Nevertheless, the drive envisaged by Vision 2020 envisaged technology driven growth in which human capital plays a dominant role. This is clear from the substance of the New Economic Model (NEM) (NEAC, 2009).[4]

From Philosophy to Planning: Confronting Issues of Concern

The above tensions give rise to a number of specific concerns that education planning must address. First evidence of widening disparities (see, for instance, Lee, 2013) raises the issue of whether education has contributed to this state of affairs or brought about the opposite? An Institute for Democracy and Economic Affairs (IDEAS) study (Patel, 2014) shows that even if it did not contribute to widening social inequity, the Malaysian education system has left groups behind. Headcounts of enrolment do not even begin to recognise the problems faced by some families to get their children to school and keep them there. This is an area education planners must take cognizance of.

In addition, educational efficacy also depends on other socio-economic variables while these variables are in turn affected by education. Notably, access to good health care can have direct influence on better education in raising the quality of life and reducing disparities among the various sectors of the population especially the rural and urban divides. This means that education planning cannot be undertaken independently from planning for other basic services. It requires the re-examination of how educational planning is to be undertaken in the context of a larger and more comprehensive planning exercise.

Third, while Malaysia endorses the principle of education for sustainable development (ESD)[5] and despite its injection into the school curriculum, planners lack understanding of exactly what transformative outcomes in the mainstream education system are to be expected. At the higher education level there is even less consciousness of this concept at the curricular and institutional levels. Thus, unlike the other academic disciplines that have serious focus and indicators, ESD is still at the fringes and not taken seriously in educational planning. It is imperative therefore to mainstream ESD by embedding the relevant indicators in the educational systems as a start. Included in these are the "intangible indicators" like social cohesion as already mentioned.

In this regard, the higher education sector must be empowered if ESD is to act as an overarching goal of the post-2015 Development Agenda with due focus given to the five priority areas of the Global Action Programme (GAP) on ESD proposed by UNESCO. The five areas are: (a) policy support; (b) whole-institution approaches; (c) training educators; (d) supporting youth participation; and (e) encouraging local community participation. Each of these themes involves a wide range of stakeholders – including governmental departments, NGOs, civil society, private sectors, educational institutions, etc. From the ESD perspective they are all actors rather than mere spectators or consumers of education and hence this shift in perspective needs to carve more "inclusive" and appropriate roles for them. To make it sustainable, it is important too to articulate ethical and values-based aspects that transcend all major religious or faith-based beliefs to further support ESD as a way of life. As discussed above, this is underpinned in the NPE but interpreted very narrowly and in isolation.

Planning for ESD raises a third area of concern. To operationalise ESD, educational planning must include a scope wide enough for the institutions, especially those of higher education, to function not just horizontally in advocating and advancing ESD, but also vertically by cascading practices

and advocacy upstream and downstream to develop capacity at the various levels of education. The Malaysian experience indicates the importance for close collaboration given that schools are experiencing a greater shortage of resources and capacities. All these point to different and innovative approaches in developing the educational plan. In all instances, it allows collaborative efforts with a wider range of other academic fields as well as participation from stakeholders and actions to be pursued more holistically.

Conclusion: Towards a New Approach to Education Planning

However defined, a good education plan should provide a clear map of the future of education and its likely impact. It is argued here that for Malaysia, the traditional education planning based on numbers and age distributions, complemented by projections of labour demand in the manner of manpower planning has run its course. Its exclusive focus on economics has also rendered this approach unable to deal with the new realities. These realities have been articulated globally in statements under international campaigns such as Education for Sustainable Development, Education for All, Millennium Development Goals and the Post-2015 Development (Education) Agenda.[6]

These realities recognise that (a) development is about more than quantitative magnitudes like growth rates and the number of people employed; the quality of growth is also important, (b) different sectors, from social to economic, are closely linked, and attention needs to be paid to these linkages in planning for any sector, and (c) the substance of education should not only be about knowledge inculcation but also about nurturing the kind of values that make for an inclusive society.

The growing disparities between the haves and have-nots reported by researchers have demonstrated that the quality of growth still leaves something to be desired. The close links between education and variables like health status – better education leads to better health care, while the latter also affects learning ability are also conspicuous by their absence in existing plans. And the current prominence given to examination grades underscores the primacy given to knowledge in the education system. Finally, the drive to benchmark international rankings has also put paid to the relevance of local context.

A new approach to education planning must deal with these deficiencies in the existing system. This means an explicit focus on vulnerable groups rather than be comforted by universal education access based

on headcounts. Such focus should fit into the overarching framework of ESD, the latter no longer dealt with in a piecemeal manner but integrated into education plans. It also means that educational planning should be part of overall planning for other sectors just as the latter also needs education planning. Further, there needs to be a move away from numbers of students doing what subjects to examine curricula given the need to create a balance between traditional subjects that add to knowledge and those that promote harmonious living in society – the spiritual vs. the intellectual dimension. Specifically, it means giving concrete substance to the overarching aspirations of NPE. A fourth new reality is ESD, which has become a major area of focus since the start of this century.[7] But ESD requires participation from all stakeholders. In terms of education planning, this means a move away from top-down planning by giving greater voice to those who are impacted by the education system. Greater accountability to these stakeholders will then be mandatory.

An important consequence of the new approach is to move away from what educationists have referred to derisively as the "commodification" of education, back to its roots – as the means to help people live a fruitful life in society, regardless of whether they enter the workforce or not. This brings the focus back to human development, not economic development.

It needs finally be noted that a move away from a purely economics-based approach does not mean wholesale abandonment of economics. It simply means that as Malaysia reaches high middle-income status, and even as the nature of the human capital required has changed towards those who can drive technology upgrading and value addition, greater emphasis would be placed on the quality of life.

Can all these be achieved? It must, because the future of Malaysia's growth and its sustainability depends on their achievement. However, unless there is a mindset shift and strong political commitment to move the planning process as described above, the dire state of education as an agent of change that exists in Malaysia today will not only continue to drag the country's human capital down but also render the quality of life that is seen in the developed world today hard for Malaysia to achieve.

Notes

*   This chapter has been rewritten for publication by Dr Cheong Kee Cheok, Faculty of Economics and Administration, University of Malaya.

1. In 1973, the film "Soylent Green" was released, with over-population its theme. Not unlike Calhoun's Universe of the mice, the film seems to draw a similar parallel focusing on a more discrete form of abnormal behaviour, cannibalism.
2. In 2013, Malaysia's trade/GDP ratio stood at 154%, third in ASEAN behind Vietnam's 164%, and of course Singapore's 359%, according to the World Bank database.
3. Cornell's Suzanne Mettler noted in her article "Equalizers No More" (2014): "The American system of higher education is in crisis. Over the past 30 years, it has gone from facilitating upward mobility to exacerbating social inequality".
4. The NEM (2009: 54) referenced Malaysia's deficiencies in human capital: "The human capital situation in Malaysia is not improving. Instead, we are losing the skilled talent needed to drive future growth".
5. Sustainability science is a "new" academic field of science in the 21st century officially introduced at the World Congress on Challenges of a Changing Earth 2001 in Amsterdam. The field reflects a desire to give the generalities and broad-based approach of "sustainability" a stronger analytic and scientific underpinning.
6. ESD was promoted by the UN through UNESCO. Similarly, "Education For All" is a global movement led by UNESCO, aiming to meet the learning needs of all children, youth and adults by 2015. The "Millennium Development Goals" (MDGs) are eight international development goals that were established following the Millennium Summit of the UN in 2000. Again led by the UN, the "Post-2015 Development Agenda is a process that seeks to establish a future development framework.
7. Unfortunately, the Wawasan 2020 Agenda has not made specific reference to sustainable development. Nor was it made explicit in the Wawasan's proposed nine challenges.

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MIGRATION AND LABOUR IN MALAYSIA: IMPACT OF IMMIGRANT LABOUR ON THE MANUFACTURING SECTOR, 1986-2010

Suresh Narayanan and Lai Yew-Wah

Abstract

The heavy reliance on immigrant labour in manufacturing remains a contentious issue and we address three concerns with respect to their impact: did they displace native workers or complement them? Did their influx impede real wage growth? And did they lower real productivity growth? We found that immigrants complemented local workers in the initial phase when a labour shortage emerged at prevailing wage levels but displaced them in later periods because employers favoured them due to significant non-wage cost savings. Immigrants did impede real wage rate growth although given the prevailing strong demand for labour, wages did rise. Finally, the contention that immigrant labour use contributed to keeping productivity low found some support. In the light of these findings we discuss policy options with respect to immigrant workers.

Introduction

The labour market effects of immigration have been studied extensively in the US (for example, Card, 2001; Borjas, 2003; 2005) and elsewhere (see Friedberg and Hunt, 1995 for a survey; Angrist and Kugler, 2003). Malaysia is an interesting case to study because, unlike in the US and Europe, post-independence immigration has comprised almost exclusively of unskilled workers from around the region. In fact, it has been described as the largest

importer of labour in Asia, with immigrants accounting for 21% of its workforce in 2010 and documented migrants alone numbering about 1.9 million (as cited in Devadason and Chan, 2014).

The focus on manufacturing is appropriate because other sectors such as agriculture and construction, where immigrants concentrate, are widely perceived to offer low paying jobs with difficult conditions of work that native Malaysians shun. Immigrants are therefore seen to complement natives in these sectors (Gill, 1988; Narayanan and Lai, 2005). Manufacturing, on the other hand, paid relatively higher wages and had a more comfortable working environment. Thus permitting the use of foreign workers in the manufacturing sector was seen as displacing and disadvantaging the natives.

In 1990, only 8.8% of foreign workers were found in manufacturing, compared to 37.7% in agriculture, 34.4% in construction and 19.1% in non-domestic services. Immigrant presence in manufacturing grew rapidly; by 2009, 32% was located in manufacturing, far exceeding their presence in sectors traditionally avoided by natives such as agriculture (26.1%), construction (15.6%) and non-domestic services (10.6%).[1]

The heavy reliance on immigrant labour has raised several concerns and three of them are taken up in this chapter. First, it is widely believed, not just in Malaysia but elsewhere, that immigrant workers deprived natives of jobs (*The Times*, 2010; Briggs, Jr., 1996; Hartlog and Vriend, 1989). Second, is the related belief that the unimpeded supply of immigrant labour has thwarted legitimate wage increases in the sector and denied natives better standards of living (Camarota, 2002; Borjas, 2005; Briggs, Jr., 1996). Third, some scholars hold that while reliance on unskilled immigrant workers may sustain an activity, it seriously impairs productivity growth (Tham and Liew, 2004; Power, 1979). A fourth important question of whether industrial upgrading was impeded by the easy availability of immigrant workers has been discussed elsewhere.[2]

Unfortunately, consistent time series data for rigorous analyses are not available. What we attempt here is to piece together limited and scattered evidence to draw preliminary conclusions regarding these concerns.

The chapter begins with a brief overview of the performance of the manufacturing sector. This is followed by a discussion on immigrant labour in manufacturing – the rationale for allowing their use and their distribution by subsectors. The main section of the chapter takes up the concerns arising from heavy reliance on immigrant labour in manufac-

turing. The chapter concludes with a summary of the findings and a discussion of the implications.

Overview of the Manufacturing Sector

The impressive growth and transformation of the Malaysian economy from an exporter of primary commodities such as tin and rubber to a major supplier of manufactured goods, especially electrical and electronics products, has been acknowledged in the development literature (World Bank, 1993). It was also highlighted as one of only 13 countries in the world to have enjoyed sustained growth of more than 7% for over 25 years (Commission on Growth and Development, 2008: 19), although the Asian financial crisis of 1997-1998 broke this winning streak.

The shift in the Malaysian industrialisation effort from import substitution to export expansion in the 1970s was guided by two major concerns. First, there was the need to break the constraints imposed by the limited domestic market (Anuwar, 1992; Ariff, 1984). Second was the pressure to provide employment for a growing labour force (McGee, 1986; Mehmet, 1988). Rapid export-oriented industrialisation was achieved by attracting foreign direct investment (FDI). Generous fiscal incentives were offered, along with the promise of cheap and abundant labour and discounted prices for land and utilities. This prompted the relocation of labour intensive production processes from the US, Japan, Singapore, Taiwan and Europe (Rasiah, 1995; Anuwar, 1992). With these changes, manufacturing overtook the agricultural sector, in terms of contribution to GDP, in 1987 (Ministry of Finance, 1988: 54).

The new emphasis in the industrial development policies naturally resulted in restructuring within manufacturing. In 1970, food and beverages, wood products, and chemical and petroleum products accounted for 64% of manufactured exports, while the electronics and electrical (EE) products provided a mere 3%. By 1989, this had changed dramatically with the EE subsector alone accounting for 52% of the manufactured exports (Anuwar, 1992: 28). The phenomenal growth of the EE subsector was the result of the tremendous efforts made by the government to convince multinational companies (MNCs) to relocate their manufacturing plants to Malaysia, especially to Penang and the Klang Valley (Hill, 1989; Narayanan and Rasiah, 1989). This subsector has since dominated manufacturing and accounted for a large share of manufactured exports; in 2010, its share stood at 55% (Bank Negara Malaysia, 2013, Annex Table A.11).

Export-oriented manufacturing remained as the major catalyst for economic growth till 2001. In subsequent periods, services emerged as the dominant sector. In 1987, the share of services in GDP was 42.7% (Ministry of Finance, 1988: 54) but by 2010 it had enlarged to 53.2%. The sector provided 59% of total employment in 2010. In contrast, manufacturing accounted for 25.2% of the GDP and 18% of total employment in 2010 (Bank Negara Malaysia, 2013, Annex Tables A1 and A7).

Immigrant Labour in Manufacturing

Immigrant workers were already being utilised in agriculture in the early 1970s (Azizah, 1995) but their numbers only became significant in the plantation and construction sectors in the 1980s (Gill, 1988; Mehmet, 1988; Narayanan, 1992). Foreign workers gained acceptance in these sectors as they were seen to be filling up openings abandoned by natives, thereby complementing the latter. Employers argued that the extent of upward adjustments in wages necessary to attract natives would render these activities unprofitable (Audong and Tan, 2000). Nonetheless, it was expected that these sectors would work towards minimising the size of the foreign workforce (Malaysia, 1993: 52; Ministry of Finance, 1995: 39).

The call to allow foreign workers in manufacturing emerged in the late 1980s, as the economy recorded several consecutive years of buoyant growth. The bulk of the demand was for unskilled workers, emanating from the labour intensive segment of electronics, textiles, non-metallic and mineral subsectors. The scarcity of labour that emerged was portrayed as a threat to Malaysia's attractiveness to new and existing foreign investors (Pillai, 1991). In truth, manufacturing was neither unattractive to local workers nor were local labour unavailable. Had wage adjustments been allowed, the scarcity might have been overcome by drawing workers from other sectors and attracting new entrants to the labour market. Instead, in November 1991, the government agreed to allow the use of foreign labour, provided employers showed that they could not get natives. However, the mechanics for establishing the inability to secure local workers remained unclear (Pillai, 1991; 1997). Data for 1991 indicated that there were about 21,000 immigrant workers accounting for a mere 2.2% of total manufacturing employment (Table 8.1).

By 1995, their share had increased to 10.3%. Even during 1997-1999, a period that felt the impact of the Asian financial crisis, immigrants

Table 8.1: Immigrant Labour in Manufacturing, 1991-2010 (selected years)

Year	Immigrants in Manufacturing	% of Manufacturing Workforce
1991	21,162	2.17
1995	142,380	10.25
1997	208,335	14.76
1999	179,427	13.21
2001	211,702	15.21
2003	271,444	18.06
2010	515,000	28.40

Note: Figures for 1991-2003 are adapted from Narayanan and Lai (2014). The 2010 share is based on total employment from Department of Statistics (2011: 14) and the number of immigrants in manufacturing as stated in World Bank (2013: 24).

accounted for between 13-14% of the manufacturing workforce. Immigrant labour grew significantly in the new millennium due to the rapid expansion of the export-oriented sector. By 2010, despite the retrenchments during 2008-2009 in response to the global recession, and other short-lived bans and freezes on foreign labour, some 515,000 were still employed in manufacturing.[3] They comprised 28.4% of the sector's workforce.

Within manufacturing, immigrant workers were distributed in three major subsectors: wood and wood-based products, electrical and electronics (EE) subsector and textiles and wearing apparel (Table 8.2).

In 2003, more than 58% of the immigrant workers in the manufacturing sector were located in these activities. More importantly, by 2003 the EE subsector that dominated manufacturing in terms of all the major measures of output, value added, export and employment, emerged as the second largest employer of immigrant workers in manufacturing (with over 51,500 workers), after wood and wood-based products

Relative to the wood and wood-based as well as the textiles and wearing apparel subsectors, which are highly labour-intensive and are thus heavily reliant on immigrant labour, the EE subsector encompasses more diverse methods of production, ranging from labour-intensive production operations and assembly to technology-intensive processes such as wafer fabrication. Immigrant workers in the EE subsector, however, manned the routine production operations and assembly work.

Table 8.2: Distribution of Immigrants across Manufacturing Subsectors, 1991 and 2003

Subsector	1991		2003	
	Immigrants	% of total	Immigrants	% of total
Food manufacturing	2,171	10.26	17,126	6.31
Textile & apparel	412	1.95	33,032	12.17
Plastic products	185	0.87	21,615	7.96
Rubber products	265	1.25	15,054	5.55
Wood products	12,466	58.91	73,111	26.93
Electrical & Electronics	1,455	6.88	51,518	18.98
Other	4,208	19.88	59,989	22.10
Total	21,162	100.0	271,445	100.0

Note: Adapted from Narayanan and Lai (2014).

Despite the lack of data to trace the patterns of immigrant labour use in the various manufacturing subsectors after 2003, it is evident that immigrants continued to dominate in these same subsectors in the later periods (cited in World Bank, 2013: 28).[4]

Impact of Immigrant Labour in Manufacturing

A Brief Analytical Perspective

Immigrants can either complement or compete with native workers in an economy or in a specific sector. A complementary relationship promises mutual benefits; better jobs and higher incomes for the immigrants (relative to jobs and earnings in their home economy) and higher growth, more jobs and rising incomes for natives in the host economy as immigrant presence eases labour constraints to growth and enlarges aggregate demand for goods and services. This view predicts income and job multiplier effects emanating from immigrant activity in the host economy or a given sector. The United Arab Emirates is a unique, if extreme, example where unskilled foreigners (who form 89% of the labour force) do not compete with the wealthy Arab natives but contribute in positive ways to the economy (Baruah, 2013).

If immigrants are good substitutes for natives, on the other hand, competition between the two could deprive natives of jobs and restrain

the growth of their earnings, even when overall growth is seemingly unaffected. Here growth would be at the expense of natives. Immigrant activity disadvantages natives when the former exceed demand and force wages downwards or at least restrain wage growth. Immigrants also displace natives when they are willing to accept lower wages or less favourable terms of employment at prevailing wages.

Three Concerns

With respect to Malaysian manufacturing, the prevailing view was that the relaxed policy on low-skilled immigrant labour helped manufacturing expand in terms of output and employment, especially in the aftermath of the recession of the 1980s, but may have had deleterious effects on native workers. More specifically, we discuss three concerns regarding the down-side of this heavy reliance on foreign workers: first, were foreign workers complements or substitutes to natives in manufacturing? Second, did immigrant presence have a depressing impact on wages in manufacturing in general, and the wages of unskilled workers in particular? Finally, did immigrant labour dampen productivity growth in the sector? We provide some tentative findings.

Immigrant Workers: Substitutes or Complements?

The first concern is whether or not immigrants took away jobs from native workers; that is, were they substitutes for natives? The evidence has been mixed in different country contexts; some studies report that migrants have complemented natives (for example, Venturini, 1999; Carrington and Pedro, 1996) or that the impact of displacing natives was negligible (Friedberg and Hunt, 1995); others hold that immigrants do indeed displace natives (Winter-Ebner and Zweimuller, 1999; Periera, 2010). In some cases, immigrants have been found to complement natives in times of higher labour demand and become substitutes for them only during economic downswings (Lee and Wu, 1992).

The export-oriented manufacturing sector experienced unprecedented growth after it recovered from the recession of the mid-1980s, with output growing at nearly 12% per annum in the two periods, 1986-1990 and 1991-1995. The consequent increase in labour demand is evident from the employment growth of 9.4% and 5.9% per annum, respectively (Table 8.3).

Table 8.3: Output, Employment and Wage Rate Growth, 1986-2010

Period	Growth (%)		
	Real Output	Employment	Real Wage
1986-90	11.6	9.4	-1.1
1991-95	11.6	5.9	4.2
1996-00	8.3	3.6	3.7
2001-05	4.2	4.6	1.6
2006-10	2.4	3.1	1.6

Note: Figures for 1986-2000 are adapted from Narayanan and Lai (2014) while 2001-2010 figures are computed from data in Ministry of Finance (various issues). Wages deflated by CPI (2000 = 100).

However, real wage rate growth during 1986-1990 actually fell by 1.1% per annum; this is consistent with the fact that immigrant labour use was not yet legalised and employers could pay them lower wages. Real wage growth only recovered to 4.2% per annum during 1991-1995 that coincided with the period when immigrants were legalised and received the same wages as natives. These findings appear to support claims that immigrant labour use had thwarted wage rate growth during the earlier period of high labour demand (Pillai, 1991). Thus, the available data are consistent with the view that immigrant labour complemented natives because there was a "shortage" of the latter at *the prevailing wage levels* and wage adjustments that could have attracted local workers from other sectors had failed to materialise because immigrant labour was permitted.

In the later period (1996-2000), when real wage growth was being sustained by legislation guaranteeing equal wages for immigrants and natives, the former became the preferred choice. This was not on account of a cost advantage (for legally there were none), but because they were less particular about working overtime during holidays, avoided taking extended breaks during festive seasons and were available as contract workers thereby reducing overheads. They also lent flexibility to the operations of firms facing volatile demand conditions since they could be laid off easily during a demand downswing (see also Periera, 2010).[5] This suggests that immigrant labour substituted for natives in subsequent periods. The much lower rate of wage growth in the post-2000 period may well be a reflection of the reality that legally permitted unskilled immigrant workers had displaced natives in large numbers.

The speed at which the immigrant workforce redistributed and concentrated in the manufacturing sector lends support to this conclusion. For example, data based on the Labour Force Surveys (reproduced in Narayanan and Lai, 2007: 9) indicated that in 1985, only 6.9% of all immigrant workers were engaged in manufacturing relative to 15.3% of natives. By 2004 the proportion of immigrant workers in manufacturing had risen to 22% and overtaken the 20% share of natives. Furthermore, the proportion of the immigrants in manufacturing exceeded their share in construction (11.8%) – a sector traditionally shunned by Malaysian workers. By the end of 2012, the picture remained largely unchanged; 39% of all immigrant workers were located in manufacturing, 29% in agriculture and 14% in construction (Bank Negara Malaysia, 2013: 23). Thus, the manufacturing sector remains the most reliant on immigrants.

Other evidence appears consistent with the view that foreign labour displaced natives in this sector. In an econometric exercise conducted by the World Bank, for a time period that is not exactly clear in the source document, it was found that for every one thousand foreigners employed in agriculture and mining, 671 new jobs were created for Malaysians (World Bank, 2013: 44). In services, the comparable figure was 741 additional jobs for natives. However, the effect in manufacturing was much smaller and not statistically significant. Thus, immigrant labour generated the largest complementary demand for local labour in services and agriculture but virtually none in manufacturing. Even so, the "pure employment multiplier" effect was less than one in both agriculture and mining and services.[6] These findings seem to suggest that the small positive effects of employing immigrants were all felt in sectors that were of lower appeal to Malaysians, where immigrants played a complementary role, but not in manufacturing where they presumably were closer substitutes to natives in the types of jobs they performed.

To the extent that immigrants were largely low or unskilled, as substitutes, they most likely displaced the low or unskilled natives in manufacturing or elsewhere. The World Bank study confirms this point though the impact was estimated for the economy as a whole and not the manufacturing sector in particular (World Bank, 2013: 48). Engaging 100 new foreign workers would leave 114 natives with primary education or less without jobs, while new jobs will be created for natives with education ranging from lower secondary to STPM level. Even so, the study appears to suggest that the benefits to better educated workers were not apparent in manufacturing: "The results give a clear indication that the main

beneficiaries of immigration in Malaysia are older workers with medium education levels who work in low-skill intensive *service and agriculture and mining sectors*" (World Bank, 2013: 51, emphasis added).

On the flip side, foreign workers, as a group, bore the brunt of un-employment during recessions. Unemployment remained low and stable during the global recession in 2008-2009 because immigrant workers were the first to be laid off (*The Edge*, 13 October 2009). In January 2009, the Malaysian government stopped the hiring of immigrant workers in manufacturing and made it clear that firms should terminate immigrant workers first ("Recession Impact", 2009). The World Bank (2009a) noted that during the crisis, about 120,000 workers, the majority of them immigrants, were retrenched in the manufacturing sector. Immigrant labour therefore helped cushion the impact of mass unemployment and helped avert major socio-economic dislocations in the economy.

Impact on Wages

Again findings in the literature are not unanimous on the impact of immigrants on the wages of natives of the same skill level. Friedberg and Hunt (1995) and Borjas (2005) report what they considered was only a small (negative) impact on wages in the US while Venturini (1999) reported a positive impact on native wages in Italy because immigrants played a complementary role to natives.

Within the Malaysian context, the negative impact of immigrant workers on wages is often greatest when employers of immigrants can avoid paying immigrants wages equivalent to those of natives doing similar jobs. Indeed, as evident from Table 8.3, over the period 1986 to 1990, when immigrant labour use in manufacturing was not yet legalised and there was no legislation requiring them to be treated equally as natives, the growth of real wage rate was negative. The (then) widespread practice of paying immigrant workers lower rates of compensation almost certainly accounted for the negative wage rate growth, although the barring of national unions in the electronics subsector may also have been a contributory factor.[7]

The formal decision to allow the use of immigrant labour in manufacturing in 1991 also made it illegal to offer different rates of compensation and benefits to natives and immigrant workers. Thus, an employer was unlikely to legally obtain a significant cost saving by opting for immigrants in subsequent periods though they may still be preferred for other reasons noted earlier. During 1991-95, both employment and real wage rates grew at healthy rates.

However, the unimpeded supply of immigrant labour to the manufacturing sector in the post-1995 period appears to have dampened the overall wage rate growth in manufacturing. The data in Table 8.3 show that the annual average growth of real wage rate in the manufacturing sector as a whole decreased from 3.7% between 1996-2000 to 1.6% between 2001-2010, a period that saw the free inflow of legalised immigrant workers.

To examine this issue further, we tested a wage determination model based on the "eclectic" formulation used by Athukorala and Devadason (2012). However, our attempt differs from the latter in both the estimation objective and the data set used. While they estimated the determinants of differential *inter-industry wages* using an industry-wide panel data set for 2000-2008, our model focused on the determination of *inter-firm differences* in wages using plant-level data for year 2006. It was interesting to see if the findings from the two different estimation procedures were consistent with one another.

The model was specified as follows:[8]

$$WG = \beta_0 + \beta_1 FW + \beta_2 SA + \beta_3 KL + \beta_4 SK + \beta_5 FOR + \beta_6 EX + \beta_7 MCR + \beta_8 UN + \varepsilon$$

where:

WG	average annual wage per worker[9]
(*WG1*)	average annual wage per unskilled worker
FW	share of immigrant workers in a firm's full-time workforce
(*FW1*)	share of unskilled immigrant workers in a firm's full-time unskilled workforce
SA	total sales
KL	capital (fixed assets)-labour ratio
SK	skill intensity (ratio of managerial and professional workers in a firm's full-time workforce)
FOR	share of foreign ownership of firms
EX	share of exports in sales
MCR	market concentration ratio (share of 4 largest plants in the total output of each subsector)
UN	share of workers who are union members

Plant-level data were obtained from the *Productivity and Investment Climate Survey 2* – a nationally representative survey that covered establishments in the manufacturing sector.[10] Two separate estimations were made: the first had WG (for all workers) as the dependent variable (and the cor-

responding variable FW on the right-hand side) and the other had WG1 (for unskilled workers only) as the dependent variable (and the corresponding variable FW1 on the right-hand side). The variables *WG* (*WG1*), *SA* and *KL* were expressed in logarithmic form while *FW* (*FW1*), *SK*, *FOR*, *EX*, *MCR* and *UN* were all expressed in percentages. The variables were checked for multicollinearity using VIF (variance inflation factor) and simple correlation coefficients. Results (available on request) indicated that there were no serious multicollinearity problems that could distort the significance of the estimated coefficients.

Of primary interest was the impact of the presence of immigrant workers on wages; this is captured by the coefficient of *FW* (*FW1*). *A priori*, it is uncertain whether this coefficient will be positive or negative. A positive coefficient would indicate that immigrant workers do not depress wages and immigrants actually complement natives. Conversely, a negative coefficient would imply that they depress wage growth and might be taking away jobs from natives.

The others are control variables. *SA* (the value of total sales) captures the derived demand for labour. An expansion in output increases the demand for labour, and, assuming labour supply is unchanged, may be expected to increase wages. Capital intensity (*KL*), similarly, was expected to raise labour productivity and efficiency and thereby increase wages. Skill intensity (*SK*) was also assumed to have a positive effect on wages as a firm with a higher proportion of skilled workers would likely be involved in higher value added activities and therefore pay higher average wages.

Similarly, *FOR* (degree of foreign equity ownership) was included because there is a large body of studies that suggest that foreign-owned firms tend to have more attractive remuneration packages compared to domestic-owned firms (Fukase, 2013; Malchow-Mølleret *et al.*, 2013; Heyman *et al.*, 2007; Martins, 2004). *EX* (share of exports in total sales), on the other hand, is expected to have a negative impact on wages because export-oriented manufacturing firms in Malaysia are generally engaged in labour-intensive production and, therefore, tend to keep their wages low to remain competitive in the export market (as cited in World Bank, 2013: 28-29). The impact of *MCR* (market concentration ratio) on wages is ambiguous, *a priori*; greater market power of monopolistic firms enables them to control both output and input prices, and thus negotiate for lower wages in hiring workers; on the other hand, these firms are also better able to attract and retain workers by offering relatively higher wages (Belman, 2004; Landon,

1970). Finally, *UN* (percentage of workers who belonged to trade unions) attempts to capture the impact of in-house unions that predominate in the EE sectors. We expected this to have a positive effect on wages.

The results of the estimated models for both all workers and unskilled workers are given in Table 8.4. Turning to the effect of immigrant workers on the wages of all workers, it is evident that all the signs of the estimated coefficients, except for market concentration, conformed to expectations and four of the eight independent variables are significant.

Table 8.4: Determination of Firm Level Wages in the Manufacturing Sector

Variables	All Workers (WG)	Unskilled Workers (WG1)
C	7.26596***	7.1118***
	(0.20227)	(0.32471)
FW	-0.00293***	
	(0.00081)	
FW1		-0.00117
		(0.00087)
SA	0.10947***	0.08972***
	(0.01440)	(0.01934)
KL	0.03355*	0.03515*
	(0.01302)	(0.01796)
SK	0.01587***	0.00862**
	(0.00212)	(0.00363)
FOR	0.00075	0.00048
	(0.00051)	(0.00078)
EX	-0.00006	-0.00065
	(0.000533)	(0.0074)
MCR	0.00191	0.01305
	(0.00118)	(0.00187)
UN	0.00053	0.00198
	(0.00118)	(0.00187)
	N = 827	N = 718
	F-statistic = 37.15	F-statistic = 6.72
	Prob >F = 0.0000	Prob >F = 0.000
	R^2 = 0.247	R^2 = 0.093

Note: Robust standard errors (in parentheses) were used for deriving the *t* ratios.
   *** $p < .01$,   **$p < .05$,   *$p < .10$

The results clearly suggest that a rising share of immigrants in the workforce has a depressing effect on wages of all workers; more specifically, the elasticity of -0.070, implies that a 10% increase in the share of immigrant workers in total employment results in a 0.7% decline in the wages of all workers.[11] This finding is not only consistent with those of Athukorala and Devadason (2012) but is remarkably close to their elasticity estimate.[12]

The result is supportive of our view that the large presence of immigrant workers had a dampening effect on the wages of workers in manufacturing. The relatively small impact corroborates our belief that while the easy availability of legalised foreign labour slowed down real wage rate growth in the sector, other factors – including a rapidly rising demand for unskilled labour – ensured that wage rate growth was not negative. If sales expansion captures this rising demand for unskilled labour, the results suggest that a 10% increase in sales would boost wages by about 1.1%.

Other factors impacting significantly on the wages of labour were *SK* and *KL*. Workers in firms requiring higher skilled workers (as measured by *SK*) and presumably engaged in higher value added activities were better off. A 10% increase in skill intensity raises wages by about 2%. Capital intensity (measured by *KL*) also had a small but positive impact on wages, presumably by raising productivity. A 10% increase in capital intensity raised wages by 0.3%. Thus, firm structure and performance were also important factors in

Table 8.5: Descriptive Statistics

Variables	Mean	Std. Dev.	Min	Max
WG^a	9.5912	0.6534	6.00368	13.6348
$WG1^a$	9.0835	0.7826	5.33057	12.9058
FW^b	23.8004	25.7544	0	100
$FW1^b$	27.0807	33.0929	0	100
SA^a	16.1196	1.9919	10.389	23.3774
KL^a	9.7996	1.7691	3.8258	16.8364
SK^b	12.8567	10.6448	0	100
FOR^b	22.5605	38.8196	0	100
EX^b	29.4645	37.7833	0	100
MCR^b	43.2497	16.5881	21.1215	79.7340
UN^b	4.8744	18.034	0	100

Notes: [a] Expressed in natural logs.
   [b] Expressed as percentage shares.

determining wages along with the size of immigrant workers (Athukorala and Devadason, 2012).

The effect of unskilled immigrant workers on the wages of all unskilled workers is less clear; although the coefficient of *FW1* is negative and therefore consistent with the view that a growing share of unskilled immigrant workers will depress the wages of all unskilled workers, it was statistically not significant. This also contradicts the finding of Athukorala and Devadason (2012).[13] On the other hand, wages of unskilled workers were influenced positively and significantly by only three variables – skill-intensity (*SK*), sales of the firm (*SA*) and capital intensity (*KL*). A 10% increase of each of these variables increased the wages of unskilled workers by 1.1%, 0.9% and 0.35%, respectively.

In summary, firm-level data confirm that the influx of immigrants negatively impacted the wage growth of workers in general; however, there was no evidence to show that the rising share of unskilled immigrants had a a statistically significant negative effect on the wages of unskilled workers as a whole. This casts doubt on the widely held belief that immigrants directly depress the wages of unskilled workers in particular; rather their presence appears to have had a dampening effect on wages in general.

Capital Use and Productivity

In general, severe labour scarcity impels industry to switch from labour using to more capital using technologies, provided labour costs rise. And, *ceteris paribus*, greater capital intensity boosts productivity growth.

In manufacturing, there was a seeming contradiction to this scenario (Table 8.6). The growth of productivity per worker was low in the periods when immigrants were used illegally in the sector. It recorded impressive growth when immigrants were legalised and complemented the natives in manufacturing (till about 1999). But productivity growth has been falling since 2000 and this appears consistent with the rising share of low and unskilled immigrant workers in manufacturing during this period. However, the capital-labour ratio (proxied by fixed assets to employment) has been rising consistently till 2005, after which a small dip is seen. One possible explanation is that the easy availability of labour encouraged employers to sustain output increases through the use of *more capital equipment that needed labour* (labour-using technologies) rather than opting for technologies that substituted labour (capital-using technologies). Lewis

Table 8.6: Share of Immigrants, Capital-labour Ratio and Productivity Growth,
1985-2010

Period	Average Share of Immigrants in Manufacturing (%)	Output per Worker (RM)	K/L Ratio (RM per Worker)	Annual Growth of Real Value Added per Worker (%)
1985-89	1.61	56,942	43,045	2.7
1990-94	4.49	140,777	57,373	4.0
1995-99	13.10	299,776	87,870	7.1
2000-04	16.57	482,239	115,924	3.3
2005-10	24.60	748,821	112,162	2.0

Note: Computed from Department of Statistics (various issues) and World Bank (2013). K/L ratio proxied by ratio of fixed assets to employment. Value added/worker deflated by PPI (1989 = 100).

(2005), for example, found evidence consistent with this view in his study of plant level data in the US for the years 1988-1993. He noted that the skills available to employers drive the spread of skill-complementary technologies. A large supply of unskilled immigrant labour therefore results in the adoption of technologies consistent with lower skilled labour. Consequently, although output and capital-labour ratio increased, productivity growth slowed down.

An earlier study by Tham and Liew using Malaysian manufacturing data for the 1991-96 period, corroborates this finding. It reported that a one unit increase in the ratio of immigrant labour to total labour in manufacturing lowered value added per worker by RM864 (Tham and Liew, 2004: 271).

Conclusions and Policy Directions

Three main concerns arising from the use of immigrant labour in Malaysian manufacturing were examined. Our evidence is consistent with the view that foreign workers complemented natives in the initial period when a sudden labour shortage surfaced in the sector, at wage levels that were prevailing then. In later periods, when wage levels continued to rise, albeit more slowly than they might have, immigrant labour displaced local workers because employers preferred them in order to reduce non-wage costs. There was also evidence to suggest that the influx of immigrant labour undermined the growth of real wages of all workers rather than the wages of only unskilled

workers. Similarly, our data corroborate the view that immigrant presence may have thwarted productivity growth.

A recent study by the World Bank (2013) on the impact of immigrant labour highlights the benefits they have undoubtedly brought to the economy as a whole. However, a careful scrutiny of the report suggests that the positive benefits from immigrant labour emanated largely from outside manufacturing. In sectors like agriculture and mining, construction and non-domestic services, where unskilled immigrants clearly complemented better skilled native workers by doing tasks that the latter were reluctant to do, returns to both native labour and capital had increased. Much of the benefits from immigrant presence accrued to native groups with medium-levels of education and not to those with poor or no education. More importantly, the findings with respect to positive gains in manufacturing were more ambiguous.

Clearly, the reliance on immigrant labour in manufacturing helped output expand, despite a slowing down of productivity growth, throughout the period under review. But this was not without costs; foreign workers competed directly with natives who are part of a low income group. This competition not only denied native workers of job opportunities in manufacturing but also slowed down the growth of the real wages of all workers. While the dampening effect of immigrants on the wages of workers appeared small, it was statistically significant. Since wages of these workers were low to begin with, any restriction on wage growth, no matter how small, would have set them back more seriously than the figures suggest. These are also groups that do not have adequate protection from established social security nets.[14]

While foreign workers may always be needed to replace natives who, through education and skill development, prefer jobs higher up the occupational hierarchy, it is important to monitor and manage the inflows to minimise the negative effects they have on the livelihoods of natives still stuck in such jobs. Thus, allowing more immigrants to legally enter the country must be coupled with effective enforcement and monitoring mechanisms to ensure that their large numbers do not crowd out natives still dependant on low skill jobs. Clear policies, along with effective monitoring and enforcement mechanisms, will also reduce the number of irregular immigrants.

The current thinking on regulating the inflow of immigrants has focused largely on raising the cost of using immigrants by equalising the wages

and benefits paid to immigrant and native workers, and by attempting to impose ceilings and raising levies on foreign workers. Whatever effect these measures may have on reducing the flow of regular immigrant workers, they will also have the unintended consequence of encouraging the use of irregular immigrants by employers, if pushed too far.

Immigrants respond as much to the job opportunities in the host economy as the lack of employment at home. Thus, there is another neglected aspect that needs attention if the inflow of foreign workers is to be reduced in the longer term. Strengthening policies that increase investments, enhance productivity and generate high growth and high income jobs will naturally reduce opportunities for immigrants and help to ebb their flow. Investments in education and skill enhancement among natives will not only support such growth policies but will also provide some measures of immunity from competition from foreign workers. As the economy's growth generates opportunities for skilled and professional labour, the stream of low skilled immigrant workers will also be reduced to a useful trickle.

Notes

1. From data cited in Devadason and Chan, 2014.
2. See Narayanan and Lai, 2014.
3. See Devadason and Chan (2014) for details on the stops, starts and U-turns that marked Malaysia's policies on immigrant labour.
4. After 2003, the *Annual Survey of Manufacturing Industries* data published by the Department of Statistics no longer distinguishes between native and immigrant workers.
5. Similar observations are also reported by Devadason and Chan (2014: 22-23) and World Bank (2013: 104).
6. It further noted that the elasticities of native employment with respect to immigrant employment in agriculture and mining, manufacturing and services were 0.15, 0.02 and 0.05, respectively. All are considerably lower than 1 and the elasticity for manufacturing is presumably not statistically significant. This would suggest that a 100% increase of immigrants would result in a 15% increase in jobs for natives in agriculture and mining and a mere 5% addition to jobs for natives in services.
7. Workers in electronics – the largest and most dynamic subsector in manufacturing – were forbidden from joining or forming national unions. Instead only in-house unions were allowed. These were small and weak (Koshy, 2010).
8. They also had a variable to measure firm-size (based on number of workers employed). However, in our model a similar size variable was found to be highly correlated with the sales of firms and, therefore, dropped.

9. Note that WG (WG1) was obtained by dividing the total annual wage bill of all workers (unskilled workers) by the number of workers (unskilled workers).

10. The survey was undertaken by the Economic Planning Unit of the Prime Minister's Department, the Malaysian Department of Statistics and the World Bank in 2007 with data for the reference year 2006. The total sample covered 1,200 manufacturing firms though the information was not always complete for all establishments. To our knowledge this is the only plant level data available. For more details on the survey, see World Bank (2009b). We are grateful to Seyed Mehrshad Parvin Hosseini, a doctoral candidate in Economics at Universiti Sains Malaysia, for allowing us to use the data and assisting with the estimation. He obtained access to the data from the World Bank.

11. Given that the left-hand side variables are in logs and the variables, *FW* (*FW1*), *SK*, *FOR*, *EX*, *MCR* and *UN* are percentage shares, the relevant elasticity figures were derived by multiplying the estimated coefficients of these variables by their respective mean values (see Table 8.5). In the case of *SA* and *KL* which are in logs, their coefficients can be interpreted directly from Table 8.4.

12. They found that real wages in an industry declines by 0.67% when the share of immigrants in total employment increases by 10%.

13. They reported a statistically significant relationship; a 10% increase in the share of unskilled immigrant workers in the unskilled labour force of an industry would decrease the real wages of all unskilled workers by 1.3%.

14. The reliance on immigrants, their large presence in low paying jobs and the consequent slower growth of wages in these jobs appear to have made these openings less attractive to a new generation of Malaysian job seekers, even poorly educated ones.

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POPULATION AGEING, POVERTY AND SOCIAL PENSION IN MALAYSIA

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Abstract

The increasing number of older population in Malaysia calls for a more inclusive policy to safeguard the wellbeing of the elderly. The old age protection schemes such as pension for civil servants, Employees Provident Fund (EPF) and the old age cash assistance are inadequate to provide for the financial needs of the elderly, especially with the extension of life expectancy. One viable solution for old age financial protection is to have a social pension system that provides non-labour income for the older people. This chapter attempts to estimate the financial cost of social pension. The financial cost of a social pension scheme was calculated as a percentage of the gross domestic product (GDP). By using data from the 2009 Household Income/Basic Amenities (HIS/BA) Survey, we estimated the potential roles of social pension in eradicating elderly poverty. Sensitivity analysis indicated that the cost of social pension could be kept at an average of 1.30% of GDP. Social pension can help to eradicate poverty among the older people although it only constitutes a rather small fraction of GDP.

Introduction

The demand for social safety net programs in East Asia has never been more pressing until the Asian financial crisis that hit the region in 1997. The crisis had a significant impact on the wellbeing of the population, albeit

to varying degrees among Southeast Asian countries. The crisis has posed great challenges to the social protection systems, and heightened the debates concerning the adequacy of the existing social protection schemes, the fiscal sustainability of these schemes as well as the population's future needs. This resulted in new social safety nets being created and a number of social programs strengthened and/or expanded (OECD, 2002).

A decade after the Asian financial crisis, the affected countries had made significant progress in formulating and implementing strategies and innovative approaches to improve social protection. However, these countries were hit again by the Global Economic Crisis in 2007/2008.

As in many Asian countries, concerns were raised in Malaysia with respect to coverage, targeting and monitoring, and more importantly, affordability and sustainability of the four major areas of social protection namely, social assistance, social insurance, employment and community-based schemes (Braga de Macedo, Fukasku and Hiemenz, 2001; Asher, 2002; Mansor and Awang, 2002; Haji Mat Zin, Lee and Abdul Rahman, 2002; Asher and Nandy, 2006; Asher, 2009; Ong and Hamid, 2010; Budina and Tuladhar, 2010). Perhaps the most challenging is sustainability of the social protection system to provide support for the fast growing ageing population.

According to Schmähl (1990), changes in the demographic processes, namely fertility, mortality and to a lesser extent migration, have altered the age structure in different ways and thus have varying consequences for social security. Age structural shifts have profound impacts on socio-economic development and family wellbeing in terms of the dependency burden (ESCAP, 2008). Decreasing birth rate, rising life expectancy, changes in employment and social structure will impose great challenges for policy-makers on the issues of retirement financing (Heller, 1997). Increase in life expectancy means longer time spent in retirement.

Population ageing in East and Southeast Asia is happening faster and at a lower level of economic development than in the West (CEPAR, 2013). Asher (2000) argues that formal old-age protection in Southeast Asia is underdeveloped given its level of economic development. The inadequacy of the retirement benefits of Southeast Asian countries including Malaysia to finance post-retirement expenses could aggravate poverty among the elderly (Asher, 2000; 2002; Asher and Nandy, 2006; ESCAP, 2008; Asher, 2009; Budina and Tuladhar, 2010; Ong and Hamid, 2010; Park and Estrada, 2012). Unless sustainability features are built in, a country's reliance on

defined benefit schemes may result in unfunded liabilities when the ratio of pension recipients to contributions increases (CEPAR, 2013).

In reviewing the situation in Malaysia, this chapter provides a snapshot of the country's ageing population. It then addresses issues relating to social security and attempts to estimate the financial cost of a comprehensive social pension scheme and quantify its potential role in alleviating poverty among the older people in Malaysia.

The Ageing Population in Malaysia

The population of Malaysia was about 28.3 million in 2010 and is projected to increase by 31% over the next two decades reaching over 37 million by 2030, and nearly 40 million by 2050 (United Nations, 2013). While the proportion of older persons aged 60 and over is still relatively low compared with the developed countries, Malaysia is experiencing a steady increase in the proportion of the elderly relative to the working-age population and total population (Park and Estrada, 2012; Zainab and Wan Ibrahim, 2014). The proportion of the population aged 60 years and above is projected to exceed that of the younger population aged 0-14 years in 2049 (United Nations, 2013).

The number of Malaysians aged 60 years and above almost doubled from 546,000 in 1970 to 1.03 million in 1991 (Table 9.1). Between the last two national censuses, this number rose from 1.45 million in 2000 to 2.25 million in 2010, and is projected to reach 3.5 million in 2020 and 6.3 million in 2040 (Department of Statistics, 2012). The proportion of persons aged 60 years and above increased from 5.2% of the population in 1970 to 6.2% in 2000 and 7.7% in 2010 (Department of Statistics, 2011; Park and Estrada, 2012). Table 9.1 also shows the declining trend in the ratio of older men aged 60 years and above to older women. The older population aged 60 and over has been growing much faster than that of the total population. The differential rate of growth is widening and the trend shows that such differential will widen in the future (Figure 9.1).

Population ageing is the result of declining fertility and increasing life expectancy. The total fertility rate has been declining from 3.9 children per woman in 1980 to 2.1 in 2013 (Department of Statistics, 2001; 2013). Life expectancy at birth has improved from 65.6 and 61.6 years in 1970 to 76.5 and 71.6 years in 2009 for females and males, respectively (Department of Statistics, 2012). From 2000-2005 life expectancy at age 60 was 20 years for

Table 9.1: Number of Older Persons Aged 60 and Above in Malaysia 1957-2010

Year	Older Persons Aged 60 Years & Above		Sex Ratio of Older Men per 100 Older Women
	Number ('000)	% of Total	
1957	288	4.6	113.2
1970	546	5.2	109.0
1980	745	5.7	97.6
1991	1,030	5.8	89.7
2000	1,450	6.2	91.4
2010	2,250	7.7	96.2

Source: Department of Statistics Malaysia, 2006; 2007; 2011; 2012).

Figure 9.1: Rate of Growth of Total Population and Older Population Aged 60+
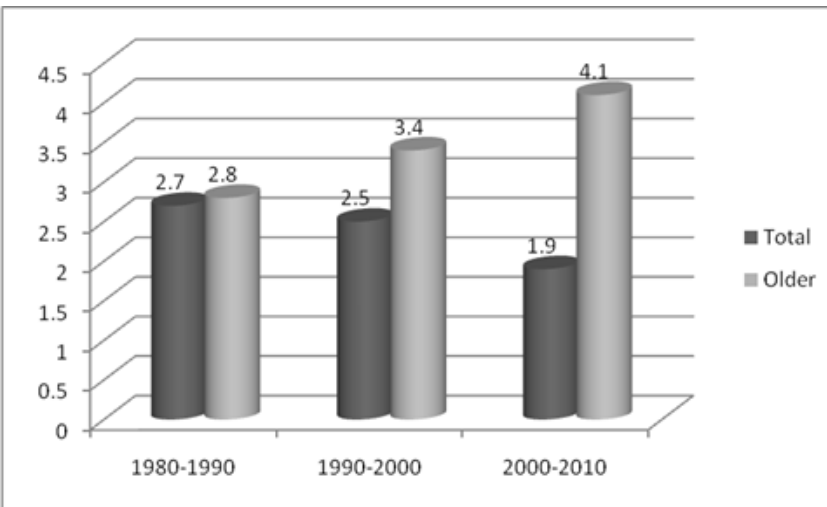
Source: Population Division, United Nations, 2012.

women and 17 years for men. Population ageing has given rise to increase in the old age dependency ratio which is the number of people older than 64 years per 100 working age population 15-64 years. Old age dependency ratio increased from 6.2% in 1990 to 7.4% in 2010, 8.0% in 2013 and is expected to reach 25% in 2050 (United Nations, 2013).

What has been the socio-economic impact of these demographic changes? Without a comprehensive social security system, about one third

of older Malaysians do not have any form of social security in old age (Ong and Hamid, 2010). In addition to population ageing, the weakening of the family support system means that there is a greater need for formal pensions and financial assistance by the government to reduce the incidence of poverty among the elderly, especially among the elderly women because they live longer and are more likely to be living alone (Park and Estrada, 2012).

To an extent, the impact of these changes has been muted by the fact that Malaysia has successfully transformed itself from a low income country at the time of independence in 1957 to an upper middle-income country today. Through various poverty eradication programs, the incidence of poverty has declined substantially from 49.3% in 1970 to 5.7% in 2004 to 3.8% in 2009 with hard core poverty declining from 1.2% in 2004 to 0.7% in 2009 (Tenth Malaysia Plan). However pockets of poverty still remain in some localities and communities (Table 9.2).

Social Security for the Elderly

The increasing number of elderly pose great challenges for economic, social and health policies in general, and social security in particular. While some elderly are protected by formal pension schemes such as the civil servant pension scheme and the private sector Employees Provident Fund (EPF), some have to turn to the government for support through welfare programs such as the *Bantuan Orang Tua* (BOT) or the elderly cash assistance, and

Table 9.2: Incidence of Poverty by Place of Residence and Ethnic Group, Malaysia 1997-2009

Year	1997	1999	2002	2004	2007	2008	2009
Poor							
Malaysia	6.1	8.5	6.0	5.7	3.6	3.8	3.8
Rural	10.9	14.8	13.5	11.9	7.1	7.7	8.4
Urban	2.1	3.3	2.3	2.5	2.0	2.0	1.7
Hard core Poor							
Malaysia	1.4	1.9	1.0	1.2	0.7	0.8	0.7
Rural	2.5	3.6	2.6	2.9	1.4	1.8	1.8
Urban	0.4	0.5	0.3	0.4	0.3	0.3	0.2

Source: Economic Planning Unit, Malaysia Plans, various years.

there are some who do not have any financial support. With the rising cost of living, the existing social protection in the forms of pensions and EPF are inadequate to meet the financial needs of the elderly. Some older persons do not even have any financial resources for daily living.

The framework to prepare for life after retirement consists of the five pillars of retirement as advocated by the World Bank. Pillar 0 refers to the "non-contributory zero pillar" in the form of social pension or general social assistance typically financed by the government. Under Pillar 0, Malaysia has introduced the cash assistance to the elderly poor with income less than RM720 per month (BOT). Pillar 1 includes the social security program providing retirement benefits as well as survivorship and disability benefits, currently being covered under the Social Security Organisation (SOCSO). The employment based plan under Pillars 2 and 3 covers two large groups of the working population – the civil servants under the defined benefit pension schemes and the private sector workers under the defined contribution Employees Provident Fund (EPF). To complement these two pillars is personal savings. The government has introduced the Private Retirement Scheme (PRS) to encourage voluntary personal saving. Pillar 4 represents the retirement choices of the elderly in their lifestyle and retirement planning. Figure 9.2 shows the five pillars of retirement.

The cost of BOT has escalated as the number of beneficiaries and types of benefits provided for BOT have increased over the years (Figure 9.3). Nevertheless, the average cost of BOT as a percentage of GDP is still rather low at merely 0.05% in 2011.

There are several weaknesses in the current formal social protection schemes in Malaysia. First, the schemes fail to include a large segment of the population. It has been estimated that approximately 30% of the Malaysian working population, mainly in the informal sector, are not covered by any formal social protection schemes (Ong and Hamid, 2010). Hence, the elderly falling into this category have to resort to other means including personal savings, family support, insurance and welfare assistance. Some elderly have to continue working to support themselves and their family. The pension system, financed through a pay-as-you-go (PAYGO) scheme, in which pensions paid to current pensioners are financed from contributions paid by current workers, has severe problems. To sustain the scheme with more pensioners as beneficiaries in the future, it needs to raise larger contributions from current workers or reduce pension benefits to the pensioners. Without pension reform, it is highly likely that the

Figure 9.2: Five Pillars of Retirement

0	1	2	3	4
SOCIAL PENSION	**SOCIAL SECURITY**	**EMPLOYMENT BASED PLAN**	**PERSONAL SAVINGS**	**RETIREMENT CHOICES**
• Non-contributory general social assistance • Old age social assistance programs	• Social insurance program providing retirement benefits as well as survivor and disability benefits	• Defined contribution plans • Defined benefit pension plans	• Annuities • Bank deposits • To supplement Pillars 1 & 2	• Lifestyle and financial choices • Decision on retirement age & labour supply • Investment decision on assets

Source: Holzman and Hinz, 2005.

Figure 9.3: Costs of BOT as a Percentage of GDP, 2010-2011
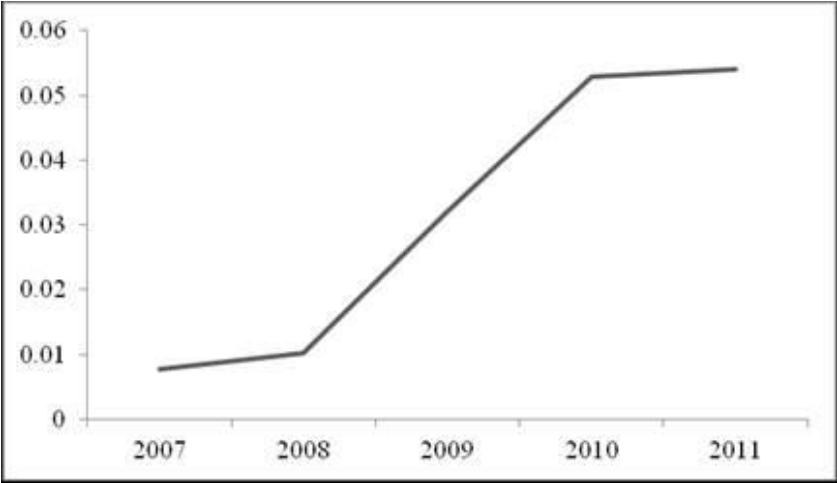
PAYGO pension scheme would go into deficit. The accumulated savings of individuals in the Employees Provident Fund (EPF) are insufficient to meet the financial expenses during retirement. Savings in a provident fund go through accumulation and decumulation phases (Asher, 1998). The cumulative balance is the net cumulative balance (contributions – withdrawals) plus interest accrued. Savings are accumulated and earn interest during the accumulation phase, i.e. working period. In the second phase, savings are depleted through lump sum or periodical withdrawals, leaving the elderly in poverty to turn to other forms of social protection to finance post retirement expenses.

Despite the apparent weakness in the current social protection schemes and the alarming situation caused by the 1997 financial crisis, Malaysia continues to place the responsibility for caring the elderly on the family and traditional means and not the state. Implicit in its social assistance progams is the "residual" benevolence approach (the zero pillar) as the last resort with help provided by family or other supportive institutions when needs of the elderly are not met as opposed to the institutional development approach where social protection becomes a universal right as societies advance (Hick, 1998). It is important for Malaysia to find the right approach to social protection from the outset, and to speed up the progression towards

a formal comprehensive social protection programs for all. Since cost and coverage considerations have been accorded priority, these two aspects may be optimised by instituting a universal or multi-tier social protection system to move away from the "residual" benevolence approach. Continuing with the residual approach may prove more costly in the long term due to population ageing.

What then must be done to ensure adequate financing of social protection programs which could also lead to the expansion of coverage in the future? One way of gauging the fiscal sustainability of such schemes is to look at the replacement rate which measures the relationship between incomes in and out of work. As cited in Asher (2002), a replacement rate of 66-75% at age 60 is considered comfortable by pension experts. Budina and Tuladhar (2010) highlight the need for fiscal policies to address infrastructure gaps, stimulate private consumption and expand social safety nets, while Asher (2009) suggests a multi-tiered social protection system involving a mix of risk sharing arrangements among the stakeholders – individuals, families, employers, the government and civil society – to safeguard against vulnerability to old age poverty.

The retirement schemes are aimed at protection against poverty in old age and consumption smoothing from work to retirement. According to Holzman and Hinz (2005), the objective of pillar 0 to protect the elderly from poverty can be achieved through "social pension" or social assistance, funded by the government's budget. Holzman, Robalino and Takayama (2009) noted that social pension has gained popularity as one form of cash transfer to the elderly but there has not been much research to assess its performance in extending coverage and preventing poverty.

Social pension can be a universal or resource-tested program. Its implementation can take four forms:

i)   Universal Social Pension in the form of cash income to all elderly, regardless of socio-economic status.
ii) Means-Tested Social Pensions solely for the poor and are conditional on the level of income.
iii) Minimum pensions targeted to the elderly with lowest retirement incomes.
iv) Social assistance targeting poor households with co-residing elderly.

In general, social pensions are paid to the elderly, but in developing countries social pensions address household, not individual poverty. In

the developed countries social pensions are expected to keep beneficiaries above the poverty line, but in developing countries they provide fixed-income supplements that are often insufficient to lift beneficiaries and their households out of poverty (Barrientos, 2009). However, it is important to note that social pensions are non-labour income for the retirees or elderly to prevent or reduce poverty in old age. Nevertheless, a common concern about the implementation of a universal pension is that the scheme is too costly.

Methodology and Data

Data for the present study came from the 2009 Household Income Survey (HIS) conducted by the Department of Statistics, Malaysia. The HIS has been conducted since 1973 to measure the economic wellbeing of the population. Starting from 1987, the Basic Amenities Survey was conducted together with the HIS which became known as the Household Income/Basic Amenities Survey (HIS/BA). The latest HIS/BA survey was carried out in 2009 and collects information on income distribution pattern of households classified by various socio-economic characteristics and basic amenities of households as well as identifies poor groups.

The methodology for estimating the future costs of implementing social pension and assessing the potential roles of such social pensions in reducing poverty is based on the definitions and concepts shown below.

Financial Feasibility

Ignoring administration costs, the cost of providing a universal pension is expressed as a proportion of gross domestic product (GDP) (Willmore, 2007) in the form of

$C = R \times B$

where C is the cost of a universal pension scheme, R is the number of recipients of the universal pension and B is the pension benefits per person.

This implies that costs for social pension will be higher with a greater amount of benefits and higher number of eligible recipients. Lu, He and Piggot (2014) suggest that the benefit be set at the poverty line to ensure that the pension scheme is affordable and sustainable. Hence, the financial

cost of the universal pension as a proportion of GDP (C) is given by the following expression:

$$C = (B/g) \; x \; (\Sigma P_i / P)$$

where *B* is the poverty line, *g* is GDP per capita, P_i is the population eligible to receive the universal pensions at age *i* and *P* is the total population.

Types of Universal Pension Schemes and Eligibility Criteria

The universal pension schemes proposed for Malaysia are categorised into six categories:

i) Universal/basic pension for all elderly;
ii) Resource-tested social pension, targeting the elderly whose household incomes falls below the poverty line;
iii) Resource-tested social pension, targeting households with co-residing elderly members;
iv) Resource-tested social pension, targeting households with co-residing elderly members whose household incomes falls below the poverty line;
v) Resource-tested social pension, targeting elderly who are heads of household; and
vi) Resource-tested social pension, targeting elderly heads of household, whose household incomes falls below the poverty line.

Measuring Poverty Incidence

The incidence of poverty is measured by the poverty line income (PLI) as reported in the Malaysia Plans. The PLI used was the average PLI of RM800 per month.

Amount of Benefits

The three different levels of benefits considered in this analysis are:

i) the absolute poverty income of RM800 per month;
ii) the hard core poverty income of RM400 per month; and
iii) the current old age assistance provided by the Department of Social Welfare of RM300 per month.

Findings and Discussion

Demographic Characteristics and Incidence of Poverty Status Among the Elderly

Table 9.3 provides the general information and socio-demographic profile of the elderly Malaysians based on the 2009 HIS/BA that covered 7,708 older persons aged 60 and over, representing a total of about 2.2 million in the country. Of these about 7.5% were living below the poverty line and 1.2% were classified as hard core poor. The incidence of poverty was higher among the oldest old aged 75 and over. A little more than half of the elderly were members of households, the incidence of poverty and hard core poverty among the elderly who are heads of households was almost four to five times

Table 9.3: Demographic Characteristics and Poverty Status of Elderly in Malaysia

Indicators	Elderly Population		Elderly Living in Hard Core Poverty (RM400/month)		Elderly Living in Absolute Poverty (RM800/month)	
	Number	%	Number	%	Number	%
All elderly	2,183,250	100.0	25,195	1.15	163,531	7.49
Age						
60 – 64	793,524	36.35	4,584	0.58	34,050	4.29
65 – 70	548,306	25.11	3,366	0.61	39,897	7.28
71 – 74	416,277	19.07	6,444	1.55	36,235	8.70
75 – 80	218,734	10.02	6,009	2.75	31,540	14.42
81 – 84	126,186	5.78	1,557	1.23	9,726	7.71
85 and above	80,222	3.67	3,235	4.03	12,083	15.06
Household relation						
Head of household	1,013,725	46.43	21,021	2.07	117,190	11.56
Member of household	1,169,525	53.56	4,173	0.36	46,341	3.96
Gender						
Females	1,117,633	51.19	16,726	1.50	101,340	9.07
Males	1,065,617	48.81	8,469	0.79	62,190	5.84
Marital Status						
Married	1,439,324	65.93	6,374	0.44	76,591	5.32
Others	743,926	34.07	18,821	2.53	163,530	22.0
Areas						
Urban	1,421,171	65.09	10,582	0.74	66,517	4.68
Rural	762,079	34.91	14,612	1.92	97,014	12.73

Source: Authors' estimates using the 2009 HIS/BA.

as high as those who were members of households. As expected, there were more female elderly than male elderly and the incidence of poverty among the former was 55% higher than the latter. Nearly two thirds of the older people aged 60 and over were still married. The incidence of poverty and hard core poverty among the unmarried was 4 to 5 times higher than those who were married. Owing to rapid urbanisation, two thirds of the elderly are now living in the urban areas. Data show that the incidence of poverty among those in the rural areas was 2.7 times as high as those living in urban areas.

The Future Costs of the Proposed Social Pension Schemes

To estimate the future cost of universal pension for the elderly in the country, we use the data from the population projections prepared by the Department of Statistics (DOS) for the period between 2010 and 2040 (Table 9.4).

Under the static poverty line income, Lu, He and Piggot (2014) proposed that government can control the social pension cost (as a proportion of GDP) by varying the eligibility age. In this study, we have considered two different ages – 60 and 65 years in our estimation. In performing the sensitivity analysis, we vary the age as well as the amount of benefits. Table 9.5 provides the result of the sensitivity analysis.

In determining the possible combinations of age and benefits, we maintain the current average cost of pension and gratuities as a percentage of GDP at 1.30% (Figure 9.4).

Table 9.4: Percentage of Elderly in the Population, 2010-2020

		2010	*2013*	*2015*	*2020*
Total Population (million)		28.6	29.7	30.5	32.4
60+	Numbers (million)	2.2	2.5	2.7	3.4
	Percentage	7.9	8.6	9.1	10.6
65+	Numbers (million)	1.4	1.6	1.8	2.2
GDP (million)		797,327	987,675	1,109,752	1,485,098
Per Capita GDP		27,889.68	33,238.60	36,402.96	45,778.15
	Percentage	5.0	5.5	5.8	6.8

Source: Department of Statistics (2012).

Table 9.5: Sensitivity Analysis of Social Pension Cost as a Percentage of GDP

| | Eligibility Age = 60 Years Old | | | | | | Eligibility Age = 65 Years Old | | | | | |
| | Fixed Benefit | | | Benefit Increased with Percentage of GDP Beginning 2013 | | | Fixed Benefit | | | Benefit increased with Percentage of GDP Beginning 2010 | | |
Initial benefits	300	400	800	300	400	800	300	400	800	300	400	800
2010	1.02	**1.36**	2.72	**1.02**	1.36	2.72	0.65	0.86	**1.72**	0.65	**0.86**	1.72
2013	0.93	**1.23**	2.47	**1.11**	1.47	2.95	0.59	0.79	**1.57**	0.71	**0.94**	1.89
2015	0.88	**1.17**	2.34	**1.17**	1.56	3.12	0.56	0.75	**1.50**	0.75	**0.99**	1.99
2020	0.76	**1.02**	2.04	**1.37**	1.82	3.64	0.49	0.66	**1.31**	0.88	**1.17**	2.34

Source: Authors' estimates.

Figure 9.4: Cost of Pension and Gratuities as Percentage of GDP
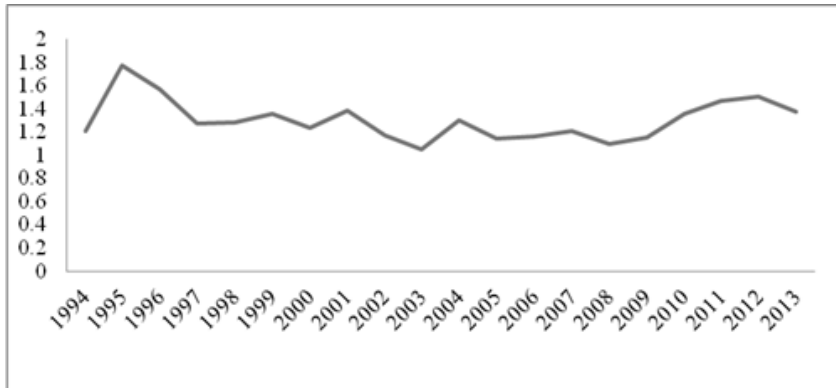
Source: Ministry of Finance, various years.

Figure 9.5: Future Costs of Proposed Social Pension
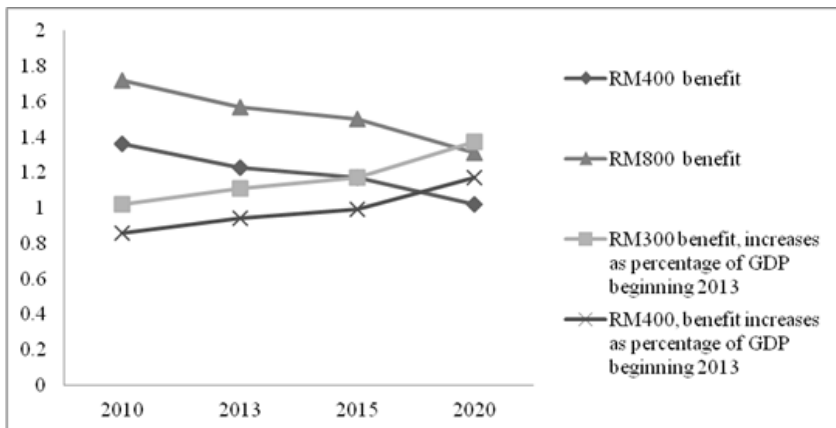
Source: Authors' estimation.

Figure 9.5 shows the future costs of the social pension based on sensitivity analysis. With the eligibility age set at 60, two benefits levels were chosen. The first was a RM400 fixed benefit and the other was a RM300 benefit that increased as a percentage of GDP beginning with the year 2013. The highest recorded cost as a percentage of GDP was 1.36% in 2010 for the former and 1.37% in 2020 for the latter. For the eligibility age

of 65, the benefits level chosen were an RM800 fixed benefit and a RM400 benefit that increased as a percentage of GDP beginning in 2010. Although the RM800 fixed benefit would have incurred cost amounting to a higher percentage of GDP than the average of 1.30 initially, it would decrease from 1.72 in 2010 to 1.31 in 2020. Nevertheless, for the RM400 flexible benefit, the cost as a percentage of GDP increased every year from 0.86% in 2010 to 1.17% in 2020.

Impacts of the Proposed Pension Schemes on Poverty

Table 9.6 shows the estimates based on the three categories outlined above with the qualifying age to receive benefits set at either age 60 or 65 years. If poverty incidence is measured on the basis of an individual older person, poverty incidence among the elderly is approximately 7.5%. If poverty incidence is measured at the household level, poverty incidence is only around 2.3%. Providing social pension to all elderly at the threshold amounts of RM300, RM400 or RM800 would lead to high costs of between 1.77% and 7.41% of income. However, if social pension is provided only to the elderly (aged 60 or 65), that are poor, the annual pension cost as a percentage of income varies between 0.18% and 0.19%. Another possibility is to use the current scheme on distribution of assistance to households instead of individuals. We analysed two different possibilities namely social pension to households with co-residing elderly and households headed by elderly. In the former, similar options to those for the individual elderly were analysed. If social pension is distributed to all households with co-residing elderly (aged 60 and 65 years old), the annual pension cost as a percentage of income ranges between 1.50% and 4.89%. This cost drops substantially if the social pension is targeted to the poor households with co-residing elderly. The annual pension cost as a percentage of income ranges between 0.15% and 0.47%. The latter option is to target social pension only to households headed by elderly persons. This option is based on the assumption that the wellbeing of the elderly, as a member of the household (poor or non-poor), would be adequately taken care of by their family members. This option would lower the cost to the government by 0.13% to 0.43%, if it is targeted to only poor households. In short, to minimise cost, the social pension has to be targeted. The results indicate that means testing based on income would be a good mechanism to limit the number of recipients of social pension.

Table 9.6: Estimates of the Impacts of the Proposed Social Pension Schemes

Category	Conditions		Total Recipients	Elderly Poverty Incidence (%)				Change in Poverty Incidence (%)			Pension Cost as a Percentage of Income		
	Eligibility Age	Income		Without Social Pension	With RM300 Social Pension	With RM400 Social Pension	With RM800 Social Pension	With RM300 Social Pension	With RM400 Social Pension	With RM800 Social Pension	With RM300 Social Pension	With RM400 Social Pension	With RM800 Social Pension
Individual elderly	60	All Income	2,183,250	7.49	2.33	1.15	0.00	-5.16	-6.34	-7.49	2.78	3.71	7.41
	65	All Income	1,389,726	7.49	3.41	2.50	1.56	-4.08	-4.99	-5.93	1.77	2.36	5.05
	60	RM800 & below	163,531	7.49	2.33	1.15	0.00	-5.16	-6.34	-7.49	0.22	0.30	0.59
	65	RM800 & below	129,480	7.49	3.41	2.50	1.56	-4.08	-4.99	-5.93	0.18	0.24	0.47
Household with co-residing elderly member	60	All Income	1,621,408	2.25	0.76	0.38	0.00	-1.49	-1.87	-2.25	2.21	2.94	5.89
	65	All Income	1,103,515	2.25	1.01	0.71	0.38	-1.24	-1.54	-1.87	1.50	2.00	4.01
	60	RM800 & below	129,531	2.25	0.76	0.38	0.00	-1.49	-1.87	-2.25	0.18	0.24	0.47
	65	RM800 & below	107,601	2.25	1.01	0.71	0.38	-1.24	-1.54	-1.87	0.15	0.20	0.39
Household headed by elderly	60	All Income	1,013,725	2.25	0.92	0.58	0.00	-1.33	-1.67	-2.25	1.38	1.84	3.68
	65	All Income	605,494	2.25	1.14	0.87	0.55	-1.11	-1.38	-1.70	0.87	1.16	2.32
	60	RM800 & below	117,190	2.25	0.92	0.58	0.00	-1.33	-1.67	-2.25	0.16	0.21	0.43
	65	RM800 & below	93,355	2.25	1.14	0.87	0.55	-1.11	-1.38	-1.70	0.13	0.18	0.35

Source: Authors' estimates based on the 2009 HIS data.

Conclusion

Population ageing in Malaysia has raised concerns with regard to the ability of the current social protection system to provide adequate support for the elderly. This support is crucial not only because of an increasing proportion of the elderly population but more importantly, many informal workers are not covered by the social safety net despite measures to expand coverage to this group, such as the introduction of the 1Malaysia Retirement Scheme recently. The success of this scheme and the new cash assistance programs such as the Bantuan Rakyat 1Malaysia (BR1M) remains to be seen.

With numerous studies arguing in favour of moving towards greater universalism in extending basic social security for all, one possible solution is to have a social pension system that provides non-labour income for older persons. Although cost has often been cited as an obstacle in providing social pension, some forms of social pension should be implemented, while keeping the cost down. This chapter estimated the financial cost of a social pension scheme using the 2009 Household Income/Basic Amenities Survey data. The financial cost was calculated as a proportion of GDP with the future cost of universal pension for the elderly from 2010 to 2040, data from HIS/BA and population projections. Sensitivity analysis was performed by varying the age eligibility and the amount of benefits provided. The results suggest that the financial cost is between 1.5% to 4.9% of GDP which can be considered low and the cost may be lower if the social pension is targeted at poor households with co-residing elderly members.

Maintaining and strengthening support for the most vulnerable groups must remain a crucial part of any long-term strategy for development. Nonetheless, in many countries including Malaysia, the search for social protection instruments to address vulnerable groups has been largely influenced by the multi-pillar taxonomy of the World Bank. Universal social protection is not on the agenda. Universal social pension can play a significant role in providing incomes and helping to alleviate the risk of poverty among the elderly as a starting point and could be extended to other vulnerable groups.

Acknowledgement

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10

UNIVERSAL HEALTH COVERAGE IN MALAYSIA: ISSUES AND CHALLENGES

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Abstract

Socio-economic development in Malaysia over the past few decades has been accompanied by improvement and expansion of the public healthcare system. The healthcare system has provided universal access to a low-priced package of comprehensive health care that has led Malaysia to claim achievement of universal health coverage (UHC). However, the Malaysian health landscape is changing rapidly. Provision of private care has grown especially in large urban towns, mainly in response to public demand. Thus far, private care has been predominantly bought and utilised by the rich but because of differentials in quality of care between the public and private sectors, unabated expansion of the private health sector has the potential to adversely affect universal access to care. This effect may be accentuated in the coming years due to ageing of the population. This chapter highlights challenges to UHC in Malaysia in the face of the changing health landscape in the country and to offer some suggestions as to how these challenges can be met.

Introduction

Socio-economic development in Malaysia over the past few decades has brought about significant improvement in the general health status of the population which has been achieved partly through sustained investment

in social infrastructure, such as schools and health facilities in the country. The modern public healthcare system has wide geographical coverage and provides comprehensive care at minimal fees to the citizens. As a result, Malaysia can lay claim to having achieved universal health coverage (UHC), the ultimate health system goal and one of the forerunning contenders for a globally sustainable development health goal post-2015.

However, the Malaysian health landscape is changing rapidly. Despite progressive upgrading of the public healthcare system, demand for private care has increased over the years, which is partially brought about by improvements in socio-economic circumstances and changing political economy conditions in the country. In spite of these changes, current evidence points to the continued maintenance of UHC in Malaysia (Health Policy Research Associates *et al.*, 2013). Nonetheless, the unabated expansion of the private health sector has the potential to adversely affect universal access to care, which is due to several inherent characteristics in the provision of private health care, including the imposition of high user fees and distribution of private facilities favouring affluent urban areas. These unwanted effects may be accentuated in the coming years by demographic changes in the country, especially because of the ageing of the population.

This chapter is intended to highlight challenges to UHC in Malaysia in the face of the changing health landscape in the country and to offer some suggestions as to how these challenges can be met.

Universal Health Coverage in Malaysia

A country is said to have achieved UHC "*when the whole population of a country has access to good quality services according to needs and preferences, regardless of income levels, social status, or residency*" and when the country adopts policies "*which incorporates objectives of equity in payments (where the rich pay more than the poor), financial protection (where people should not become poor as a result of using health care) and equity in access or utilisation (where care received is according to need rather than ability to pay)*" (Gilson *et al.*, 2007). In short, UHC is achieved when access to a comprehensive package of health care services is made available to the entire population using public sources of financing without burdening the poor.

Malaysia is an example of an upper middle-income country with a long established public healthcare system providing universal access to a

Table 10.1: Selected Health Indicators, Malaysia 1957-2010

Indicator	1957	1980	1990	2000	2010
Life Expectancy at Birth (years)[a]					
Males	56.0	66.4	68.9	70.0	71.9
Females	58.0	70.5	73.5	74.7	76.6
Infant Mortality Rate (per 1,000 live birth)	75.5	23.8	13.1	6.5	6.7
Maternal Mortality Ratio (per 1,000 live births)	3.2	0.6	0.2	0.3	0.3
Per capita GDP[b] (RM)	NA	8,748	11,988	18,353	23,669

Notes: [a] Until 1990, refers to life expectancies at birth for Peninsular Malaysia only.
[b] In constant 2005 prices. NA = not available.
Sources: Ghani and Yadav (2008), Department of Statistics Malaysia (2013).

comprehensive package of health care services, which is financed mainly through general taxation. The network of public healthcare facilities by 2012 included 147 public hospitals and special medical institutions (with 42,707 beds) and 3,034 static health clinics (Ministry of Health Malaysia, 2013a). Services provided by these government-owned facilities are heavily subsidised so that the annual cost of recovery is estimated to be only between 3% and 5% (Rohaizat, 2004: 43-46). Historically, the public healthcare system has been the backbone of the delivery of health care in the country and its existence has made a significant contribution to the rapid improvement in the health status of the Malaysian population over the period 1957-2010 (Table 10.1).

The health indicators of Malaysia have improved so much that by 2012, Malaysia had achieved levels of life expectancies comparable with countries of similar per capita incomes, while infant and maternal mortality statistics were closer to countries with higher per capita incomes (Table 10.2).

Although there has been a long presence of private provision of health care in the country, the early private practitioners were mainly either providers of traditional health care or doctors practising in single medical clinics. The rapid development of the private health care sector started only in the 1980s and this was more apparent in the hospital sector (Chee, 2008). In 1980, there were 50 private hospitals in the entire country with

Table 10.2: Selected Health Indicators – Malaysia and Countries Grouped by Per Capita Incomes, 2012

Country/Groups	Life Expectancy at Birth (years)		Infant Mortality Rate (per 1,000 live births)	Maternal Mortality Ratio[a] (per 100,000 live births)
	Females	*Males*		
Malaysia	76	72	7	30
Low income	63	60	56	450
Lower middle income	68	64	46	240
Upper middle income	76	72	16	57
High income	82	76	5	17

Note: [a] Maternal mortality ratio for year 2013.
Source: World Health Organization (2014b).

1,171 beds, which accounted for only 5.8% of the total hospital beds in the country (Ministry of Health Malaysia, 1982). Since then, the number of private hospital beds have increased at a much faster pace than beds in public hospitals such that by 2012, the 209 private hospitals contributed 32.0% of total hospital beds in the country (Ministry of Health Malaysia, 2013a). This rapid development of the private health care sector came about because of several factors, which *inter alia*, was a consequence of efforts by the government to increase private participation in the country's economy so as to reduce presence of the government in the economy and lower the level and scope of public spending (Barraclough, 1999). The advent of the 1997 Asian financial crisis also saw health tourism being promoted as a means of survival for existing private hospitals and later as a means of bringing in foreign revenue to the country (Chee, 2007). As the Malaysian economy recovered by 2000, higher demand for private care also came from the increasingly affluent and discerning society (Chee and Barraclough, 2007).

Private hospitals in Malaysia are mainly for-profit institutions. Driven by market demand, these hospitals are concentrated in the urban areas of the more affluent and densely populated states of Penang, Malacca and the Federal Territory of Kuala Lumpur (Table 10.3). There is some public perception that there exists quality differentials between the public and private health sectors. For one, private hospitals are better equipped with more advanced medical equipment compared to their public counterparts. In 2011, 75 out of the 105 magnetic resonance imaging (MRI) machines in

Table 10.3: Distribution of Private and Public Acute Care Hospital Beds, Malaysia, 2010

	Population Estimates ('000)	No. of Public Hospitals	No. of Public Hospital Beds	Public Hospital Beds: 100,000 Population	No. of Private Hospitals	No. of Private Hospital Beds	Private Hospital Beds: 100,000 Population
Perlis	232	1	404	174.14	0	0	0.00
Kedah	1,948	9	2,350	120.64	10	542	27.82
Penang	1,561	6	1,939	124.22	23	2,135	136.77
Perak	2,353	14	3,470	147.47	15	988	41.99
Selangor[a]	5,535	12	4,797	86.67	48	2,836	51.24
K. Lumpur	1,675	4	4,137	246.99	37	2,859	170.69
N. Sembilan	1,021	6	1,527	149.56	8	428	41.92
Malacca	821	3	1,006	122.53	4	690	84.04
Johore	3,348	11	3,609	107.80	30	1,111	33.18
Pahang	1,501	10	1,907	127.05	7	204	13.59
Terengganu	1,036	6	1,342	129.54	1	20	1.93
Kelantan	1,540	10	2,399	155.78	3	162	10.52
Sabah[b]	3,294	22	3,962	120.28	5	165	5.01
Sarawak	2,471	20	3,407	137.88	12	465	18.82
Malaysia	28,334	134	36,256	127.96	203	12,605	44.49

Notes: [a] Including Federal Territory of Putrajaya.
  [b] Including Federal Territory of Labuan.
Sources: Derived from Department of Statistics Malaysia (2010) and Sivasampu *et al.* (2013).

the country were functioning in private hospitals as were 91 out of the 143 computerised tomography (CT) scan machines (Sivasampu *et al.*, 2013).

Another instance of perceived quality differentials between the public and private health sectors relate to the distribution of medical specialists. Currently there are more doctors practising in the public sector than in the private sector (Figure 10.1). However, the distribution of specialists in several clinical disciplines is skewed toward the private sector (Table 10.4). This situation may be related to the higher remuneration that these specialists can obtain in the private sector.

Prices of public and private health care services in Malaysia differ markedly as can be observed from a comparison of the legislated fee schedule for Ministry of Health services (Government of Malaysia, 1994) and the regulated schedule of fees for private healthcare facilities (Government of Malaysia, 2006). Whilst the fees of public care services have been capped at

Figure 10.1: Distribution of Actively Practicing Doctors in the Public and Private Sectors, Malaysia, 1990-2010
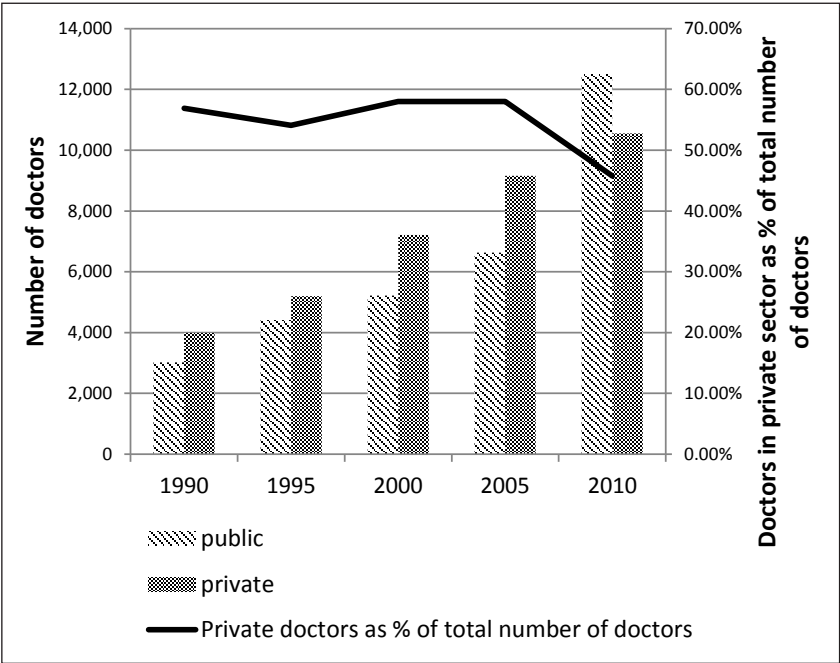
Sources: Ministry of Health Malaysia (1991), Ministry of Health Malaysia (1996), Ministry of Health Malaysia (2007) and Ministry of Health Malaysia (2012).

Table 10.4: Share of Selected Medical Specialists in the Private Health Sector, Malaysia, 2011

Medical Specialists	*Total*	*% in Private Sector*
Psychiatrists	234	20.51
Anaesthetists	685	44.38
General surgeons	557	46.50
Vascular surgeons	19	47.37
Hepatobiliary surgeons	30	40.00
Colorectal surgeons	30	76.67
Obstetricians & Gynaecologists	839	61.02
Breast surgeons	7	57.14
Oncologists	67	56.72

Source: Sivasampu *et al.* (2013).

low rates through government subsidies, fees charged by private providers are generally very expensive. Public and private health care are funded from different sources. The funding for public care comes mainly from general taxation, which is progressive. Because of this, the financing of the public healthcare system is drawn from the rich in the country (Yu *et al.*, 2008). In contrast, private care is mainly compensated using direct household out-of-pocket (OOP) payments. To a much smaller extent, funding for private care also comes from private health insurers or from employers as part of employee health benefits. Thus, in addition to the physical infrastructure, the growth of the private health care sector in Malaysia can also be observed from the large OOP payment shares in total health financing in the country (Figure 10.2). It is estimated that Malaysia spent a total of RM37.5 billion on health in 2011, out of which RM14.1 billion or 37.7% came from OOP payments (Ministry of Health Malaysia, 2013b).

Direct household OOP payments for health are the least equitable manner of paying for health care and has been the main health financing concern for countries pursuing the goal of UHC (World Health Organization, 2010; 2014a). OOP payments for health require the ill to have sufficient money in hand at the point of need or else they may have to forgo it (Wagstaff, 2008; Wagstaff and van Doorslaer, 2003; Xu *et al.*, 2007). This money may come from household savings, borrowings or even sales of household assets (Whitehead *et al.*, 2001). Thus, it can be seen that

Figure 10.2: Private Health Financing Sources, Malaysia, 1997-2011
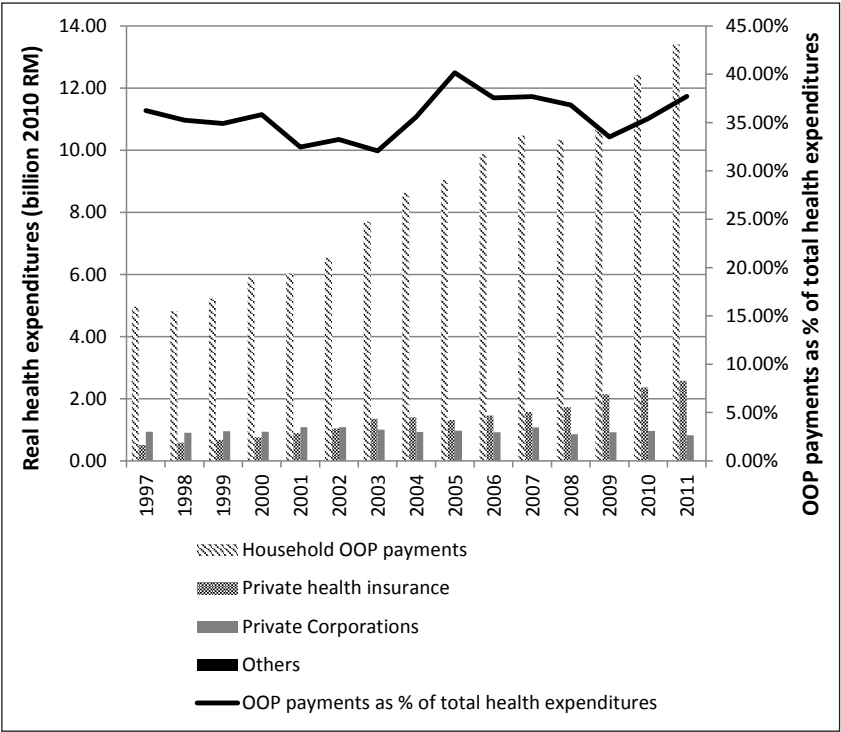
Source: Ministry of Health Malaysia (2013b).

household welfare, especially for the poor, may be negatively affected by OOP payments in the short- or long-term or both. This comes from the assumption that payments for most health care services, at least for the poor, are non-discretionary and can lead to immediate reduction in resources for other goods and services, including essential items, such as food and housing. Borrowings and sales of economically productive assets can also affect long-term household welfare (Russell and Gilson, 2006). Thus from a welfare standpoint, poor households need to be protected from making excessive OOP payments for health.

Higher OOP payment shares in a country's overall financing mix have been shown to have higher negative welfare impact on the country's poor households (Xu *et al.*, 2007). It has been estimated that only when the country's OOP payment share drops below 15 to 20% of total health

expenditures that household financial catastrophe caused by such payments can drop to negligible levels (Xu *et al.*, 2010). Despite this conventional wisdom, evidence from Malaysia has shown that good financial risk protection for health can co-exist with high levels of OOP health payments.

Although at the national level, more than a third of the total health expenditures come from OOP payments, this mode of health payment only makes up a small component of total expenditures for an average household in the country (Health Policy Research Associates *et al.*, 2013). Overall, the OOP shares of household consumption have fallen from 1.4% in 1998 to 1.1% in 2009. As a result of the low household OOP payment burdens, few households in Malaysia incur health payments that can be deemed catastrophic to their welfare. In 2009, it has been estimated that less than 2% of households incurred health payments exceeding 10% of the total household consumption (Health Policy Research Associates *et al.*, 2013), which has been shown to be the lowest among 18 Asia Pacific economies, including Taiwan and Hong Kong. In addition, richer households appear to have higher OOP payment shares than poorer households in the country, and thus, households which did incur catastrophic OOP payment shares were found to be concentrated among the richer households. Some households in the country have been impoverished because of medical payments but the numbers are small. In 2009, about 0.3% of households were impoverished in this manner (Health Policy Research Associates *et al.*, 2013).

UHC requires that the entire population receives health care that they need. Evidence for this fair distribution of health care access in Malaysia can be obtained indirectly from an examination of health care utilisation rates. In 2011, it was estimated that there were 4.4 outpatient clinic visits per person and 86 hospital admissions per 1,000 persons in Malaysia (Institute for Public Health, 2012). The distribution of these services were found to be equal across all households, regardless of socio-economic status. However, as expected poor households used more public health care services than the rich.

The claim that Malaysia has achieved UHC appears to be supported by the findings from this brief assessment of the country's healthcare system. Despite the growing private healthcare systems, it is evident that the average household OOP health payment burden in Malaysia has been relatively small. As a result of this and the preference of the poor for public care, the population enjoys high levels of financial risk protection. The use of health

care services has also been found to be equally distributed across poor and rich households.

Universal Health Coverage under Challenge

Economic development in Malaysia has brought about changes in population composition, the way people live their lives and the environment they live in. These changes have in turn brought about changes in morbidity and mortality patterns in the country. The changing levels of health needs pose a challenge to the capacity of the country's healthcare system to cope, and thus, may pose a challenge to the sustenance of UHC in the country.

Due to demographic transition, the population of elderly persons is increasing in Malaysia. Population projections show that population shares of those aged 65 years and above will more than double in 30 years from 5.0% in 2010 to 11.4% by 2040 (Table 10.5). Life expectancies at age 60 years have already increased from 18 years in 1990 to 20 years in 2012 for females and from 16 years in 1990 to 18 years in 2012 for males (Table 10.6).

How would these changes affect the healthcare system in Malaysia? Though health care utilisation rates for the various age groups did not differ much over time from 1986 to 2011, health care utilisation exhibited a u-shaped pattern as rates were observed to be higher among the very young and for the older age groups (Health Policy Research Associates *et al.*, 2013). With population ageing, it is anticipated that the volume of health care services required to meet the health care needs of the elderly will increase. However, a close examination of these utilisation patterns also reveals that

Table 10.5: Population Projection by Age Groups, Malaysia, 2010-2040

Year	0-14 ('000)	%	15-64 ('000)	%	65+ ('000)	%	Median age
2010	7,822.1	27.4	19,341.4	67.6	1,425.1	5.0	26.3
2015	7,733.4	25.4	20,971.9	68.8	1,779.9	5.8	28.2
2020	7,780.7	24.0	22,445.9	69.2	2,214.6	6.8	29.9
2025	8,009.5	23.4	23,533.4	68.6	2,751.3	8.0	31.5
2030	8,087.9	22.5	24,542.0	68.2	3,335.7	9.3	33.0
2035	7,893.4	21.1	25,606.1	68.5	3,889.9	10.4	34.5
2040	7,537.2	19.6	26,615.6	69.0	4,405.1	11.4	36.0

Source: Department of Statistics Malaysia (2012).

Table 10.6: Life Expectancies at Age 60 – Malaysia and Countries Grouped by
Per Capita Income, 2012

Country/Region	Females		Males	
	1990	*2012*	*1990*	*2012*
Malaysia	18	20	16	18
Low income	16	18	15	16
Lower middle income	17	19	15	16
Upper middle income	19	21	17	18
High income	22	25	18	21

Source: World Health Organization (2014b).

those in the very advanced age groups have lower utilisation rates than
expected. The reasons for this observation are not known.

The pattern of diseases occurring in Malaysia has also been changing
from one dominated by communicable diseases of which malaria and
tuberculosis were significant scourges to one in which non-communicable
diseases, such as diabetes mellitus and ischaemic heart diseases, are
becoming more prominent (Low *et al.*, 2013). Many of these conditions
are related to adoption of more sedentary but stress-filled lifestyles,
consumption of tobacco and foods with high fat and salt content. In
general, this epidemiological transition from communicable to non-
communicable diseases has been observed in high-income economies. As
a middle income economy, mortality rates for non-communicable diseases
in Malaysia are already about five times the rates for communicable diseases
(Table 10.7).

The prevalence of many non-communicable diseases has increased
with age. As the population of Malaysia grows older, the burden of non-
communicable diseases is expected to further increase. To maintain UHC,
the Malaysian healthcare system will need to increase its capacity to meet
these increasing health care needs, particularly in the public healthcare
system. There are already some indications that the public system is
overloaded. The 1996 National Health and Morbidity Survey found that
more than half of the respondents did not seek care from the nearest health
facility to their homes and 61.3% of these by-passed public health facilities
in favour of a private clinic or private hospital (Institute for Public Health,
1997). The most common reason given for this was the long waiting times
at public health facilities.

Table 10.7: Mortality Burdens for Communicable and Non-communicable Diseases and Injuries – Malaysia and Countries Grouped by Per Capita Income, 2012

Country/Region	Age-standardised Mortality Rates (per 100,000 population)		
	Communicable Diseases	Non-communicable Diseases	Injuries
Malaysia	117	563	63
Low income	502	625	104
Lower middle income	272	673	99
Upper middle income	75	558	59
High income	34	397	44

Source: World Health Organization (2014b).

There are also indications that some people with health needs may have fallen through the cracks in the system. The findings from the 2011 National Health and Morbidity Survey showed that 7.2% of the Malaysian population aged 18 years and older had been diagnosed to have diabetes mellitus (Institute for Public Health, 2011). The survey also carried out blood tests to detect diabetes among those who claimed not to have the disease. Overall, the prevalence of diabetes was 15.2%, which showed that only 47.2% of persons with diabetes have been diagnosed as having the disease. Although the issue of undetected health needs may have been due to low public awareness of medical conditions, and therefore, patients not seeking medical screening, this situation still does reflect on the performance of the health system since health education is one of the essential components of health care. The poor response to free medical screening tests offered by the Social Security Organisation (SOCSO) to its members for reasons including "not convenient", shows that the Malaysian healthcare system's health promotion messages have yet to be fully internalised by the public (*The Star*, 12 June 2014).

The prices of medicines, including those normally prescribed for chronic diseases, have been increasing steadily over time. Most of the medicines dispensed from public hospitals or clinics are provided free or for a small fee. However, there is evidence to suggest that the availability of some commonly used medicines may be scarce in public facilities leading to the need to purchase them privately. Babar *et al*. (2007), examined issues

related to increasing costs of medicines in Malaysia. The authors conducted a survey of the availability, prices and affordability of medicines in private and public health facilities in Malaysia including 20 public sector hospitals. They concluded that the availability of medicines was low in the public hospitals even for medicines listed in the National Essential Drug List[1] and the Ministry of Health (MOH) Drug Formulary[2] and that this may have implications on patients' access to these medicines since prices for the medicines purchased from private pharmacies were found to be high. The authors noted that a month's supply of common medicines to treat high blood pressure purchased from private pharmacies may cost up to a month's wages for the lowest paid public sector worker in Malaysia. Using data from a household expenditure survey, it has been estimated that about 17.7% of the total household health expenditures in 2009 was used to purchase medicines, both prescription and over the counter medicines, from private pharmacies (Health Policy Research Associates *et al.*, 2013). But what is more telling is that households in the poorest quintile had to devote 30.7% of their household health expenditures to purchase medicines (Table 8). This payment burden for purchase of medicines among the poor may be related to the scarce provision of free drugs in public health care centres.

Despite increasing burdens of non-communicable diseases Malaysia has not quite emerged from the epidemiologic transition[3] and both communicable and non-communicable diseases still plague the populace (Low *et al.*, 2013). The 2010 Burden of Disease Study showed that the

Table 10.8: Distribution of Household OOP Payments for Health Care by Socio-economic Status Quintiles, Malaysia, 2009/2010

Expenditure Categories	Population Quintiles					Overall
	Poorest Quintile	2nd	Middle	4th	Richest Quintile	
Medicines	30.7	29.5	25	21.2	13.2	17.7
Health Supplements	12.6	14.3	19.6	18.3	30.0	24.8
Outpatient Care	29.8	23.5	21.8	19.0	16.5	18.4
Inpatient Care	11.0	9.1	8.5	8.1	14.8	12.3
Others	15.8	23.7	25.0	33.4	25.5	26.8
Overall	100	100	100	100	100	100

Source: Adapted from Health Policy Research Associates *et al.* (2013).

leading causes of Disability Adjusted Life Years (DALYs)[4] lost in Malaysia included conditions such as HIV/AIDS and lower respiratory infections (Institute for Health Metrics and Evaluation, 2013). Of all the communicable diseases in the country, HIV/AIDS deserves special consideration from the viewpoint of health policy because HIV/AIDS has exhibited the highest percentage increase in DALYs over the 30-year period from 1990 to 2010 (Figure 10.3). During this same period, mortality rates decreased for all age groups except for males aged between 25 and 44 years and the largest increase in mortality rates was experienced by males aged between 35 and 39 years (Figure 10.4). The largest contributor to the mortality increase of males in this age group was from HIV/AIDS. In 1990, 11% of all deaths

Figure 10.3: Leading Causes of DALYS and Percentage Change from 1990 to 2010, Malaysia
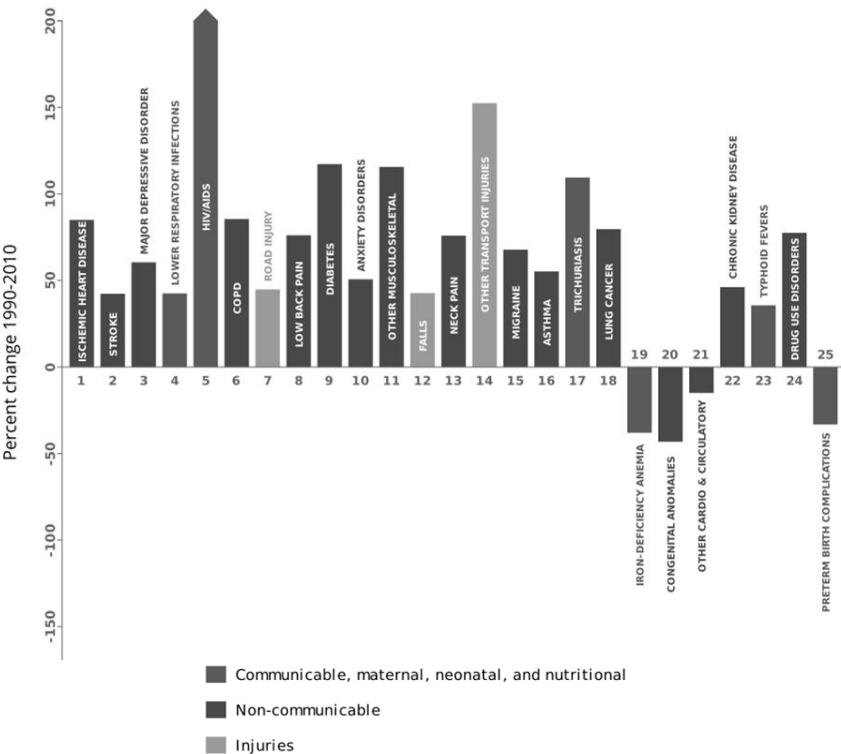
Source: Institute for Health Metrics and Evaluation (2013).

Figure 10.4: Percentage Decline in Age-specific Mortality Rate by Sex, 1990-2010, Malaysia
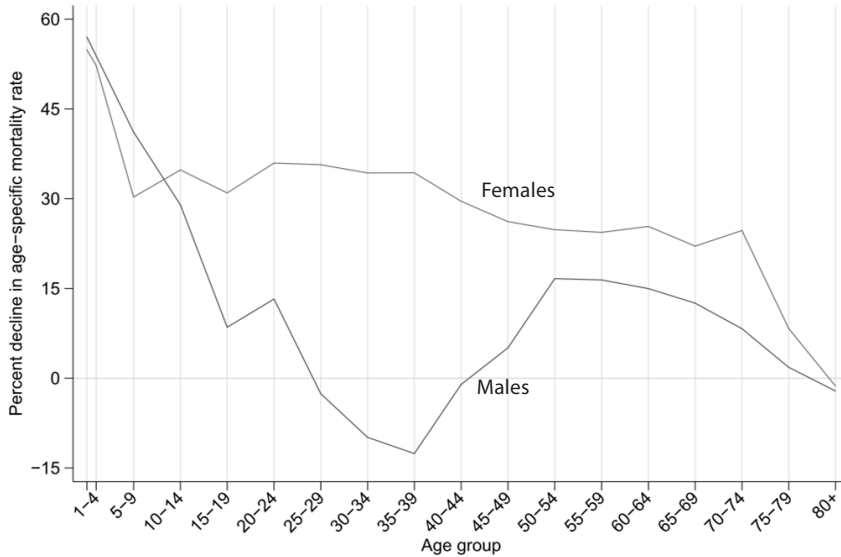
Source: Institute for Health Metrics and Evaluation (2013).

among males aged 35 to 39 years was caused by HIV/AIDS and this share increased to 33% of all deaths in 2010 (Institute for Health Metrics and Evaluation, 2014).

Officials from the Malaysian healthcare system and civil society have been working hard to combat the HIV epidemic in the country. This two-prong approach is aimed at reducing new infections and providing care for those who have already been infected. Most of these efforts have been financed using public funds. In 2013, 95% of the RM180.87 million spent on prevention of HIV and treatment of people living with HIV (PLHIV) have come from domestic funding (Ministry of Health Malaysia, 2014). About half of this amount went to the purchase of antiretroviral (ARV) therapy, a combination of drugs that have been found to prolong and improve quality of life for PLHIV. Despite this large financial investment, it is estimated that only 42% of those whose clinical condition indicates need for these drugs actually receive them (Ministry of Health Malaysia, 2014).

Thus, it can be argued that the ongoing demographic and epidemio-logical transitions in the country have exposed genuine quality shortages

in some areas of public provision of care. These include long waiting times for clinic consultations (Institute for Public Health, 1997) and the inadequate stocks of even generic medicines for treatment of common non-communicable diseases like hypertension (Babar *et al.*, 2007). This has also affected clinical management of some communication diseases as shown by the ARV treatment gap for PLHIV (Ministry of Health Malaysia, 2014). At the same time, private care has been perceived to be of higher quality than public care mainly due to the skewed distribution of medical specialists and advanced medical equipment, which are concentrated in the private health care sector (Sivasampu *et al.*, 2013). Over time these quality differentials between the public and private health sectors may increasingly compel poorer households to purchase higher priced private care even at the risk of exposing themselves to financial catastrophe or even worse, they may have to do without needed treatment. This would eventually place UHC in Malaysia in jeopardy.

Meeting Future Health Needs in Malaysia

Indicators of population health over time have shown marked improvement in levels of health in Malaysia. For some, such as maternal and infant mortality rates, the indicators have reached such low levels that further improvement will be difficult. This observation lends support to the claim that the country has achieved UHC status for some time. However, the examination of average population statistics such as these may mask inequitable health distributions. It may still be possible that there exists pockets of the population with a high burden of health needs that require additional assistance over and above that provided to the rest of the population. The root causes of these health differentials need to be under-stood and assistance programs need to be carefully designed to ensure that they do not adversely affect the vulnerable segment of the country's population. The identification of these groups with higher health needs requires examination not of average health indicators but distribution of these indicators in the population, such as by gender, age groups, urban-rural residence, ethnic groups, educational groups and income groups. Un-fortunately, such information is not always available in the public domain although government agencies are known to collect most of the information routinely. There needs to be greater sharing of information between such data collection agencies and the public, including the research community.

Improvement in the health of vulnerable population groups should be a shared responsibility between the government and society in general. One of the first steps to accomplish this task is to allow transparency and sharing of information so that assistance can be targeted to those who need it more.

Examination of distributions in health has often shown differentials in life expectancies and certain health indicators favouring females over males. These unequal health patterns have been customarily accepted as the norm and have often been attributed to the physiological and anatomical differences between males and females. However, it can be argued that these differentials can be partially ameliorated if the healthcare system had been made more "men-friendly" (Tong *et al.*, 2011). The current public health care set-up caters predominantly to women leaving men reluctant to seek care even if they have recognised their health needs. The examination of unequal health distributions from the perspective of social determinants of health may also be beneficial in other circumstances to improve access to needed care for all.

Although population ageing has received some recognition in Malaysia, the health response to this phenomenon has been mostly focused on curative aspects of the diseases of the elderly. Successive economic development plans have indicated expansion of geriatric care programs in the public healthcare sector. However, more needs to be done for the elderly living in the community, often alone and without family support. Rapid economic development in the country has led to urbanisation of the population where the young migrate to urban centres for employment leaving their elderly parents behind in the villages. Hairi *et al.* (2010) examined a group of elderly in a rural community in Malaysia and found levels of physical and functional disabilities that were higher than levels in developed countries. These elders will require higher levels of assistance in daily living than is currently available to them. Culturally, placing our elderly in institutional care may not be the answer in our society. If so, steps need to be taken now to examine alternative living arrangements for them. Provision of community support for the elderly would need to take a higher priority than is currently the case. In addition to the direct needs of the elderly, shared societal responsibility also indicates the need for respite care support for care givers of the elderly.

The Malaysian public healthcare system has been credited with having brought about UHC in the country. However, the system's capacity to cope, in the face of an ageing society with its double burden of communicable

and non-communicable diseases, has been called to question. It is obvious that the country would need to invest more into the public system than is currently the case.

In 2011, government expenditures on health in Malaysia made up only 2.1% of GDP or 6.2% of overall government expenditures (World Health Organization, 2014b). These are much lower than figures for other upper middle income countries where on average, government expenditures on health made up 3.3% of GDP or 11.8% of overall government expenditures. If the public system is to be the sole provider of care in the country, the quantum of this investment will need to be very much higher. However, the 10th Malaysia Plan included a call for greater development of the private health sector, albeit as an avenue for enhanced national economic growth, and that there should be "*greater collaboration between the public and private healthcare systems to allow effective delivery, greater efficiency and affordable costs*" with an element of cost-sharing between patients and the government (Malaysia, 2010). With higher fees in the private sector, this would effectively translate to a dual healthcare system with a public health system which provides lower quality care for the poor and a better quality private health system catering mainly to the demands of the rich. The crux of the issue here is the question of what should be included in the package of health care services which is understood to be the entitlement of all in Malaysia under UHC. If it can be shown that the public healthcare system has indeed made such a package universally available then it can be argued that this two-tier system will not compromise UHC since the private system is merely providing services that are over and above the agreed upon minimum package already available to all. Unfortunately, the contents of this "package of services" have not been openly debated in Malaysia. Perhaps, it is time that such a debate should now be held.

Public debate should also include discussion of acceptable levels of public and private provision of care in Malaysia. As seen in this brief chapter, the development of these two sectors may not progress in a synergistic manner. Expansion of one sector may be at the expense of the other. If a health system dominated by private sector providers is deemed socially acceptable, then there are some merits to the recommendation of a social health insurance system for Malaysia as envisaged under the 1Care for 1Malaysia proposal by the Ministry of Health (Ministry of Health Malaysia, 2009). The existence of a government controlled social insurance fund to reimburse health care consumed by the population can supplement and

strengthen existing regulation of the private sector. Social health insurance can thus be thought of as an additional source of funding with less equity issues as OOP payments and can be used to improve public delivery of care without excessive government investments. At this point in time it is not certain whether the proposed social health insurance scheme would prove to be more equitable than the current taxation-based one as this is heavily dependent on the contribution rates, co-payments and benefit entitlements which have not been released to the public.

Conclusion

In Malaysia, UHC has purportedly been long achieved through an extensive public healthcare system that provides nearly-free and comprehensive health care, which is financed through general taxation. This public system is facing challenges partially arising from demographic and epidemiological changes in the country and partially from the expansion of private provision of care. Further improvement of the public system and maintenance of universal access to health care in the country will require public debate and consensus as to the future structure and organisation of the healthcare system.

Notes

1. The National Essential Drug List is a list of drugs required for the treatment and management of locally prevalent disease conditions and health needs. The Malaysian list recommends drugs for use in both public and private health facilities. Information available at <http://www.pharmacy.gov.my/index.cfm?&menuid=6&lang=EN>.
2. The MOH Drug Formulary is a list of drugs which have been approved for use in MOH health facilities and which are usually purchased centrally and provided free to patients. Information available at <http://www.pharmacy.gov.my/index.cfm?menuid=7>.
3. Refers to transition in the disease burden of a country from one dominated by communicable diseases to one dominated by non-communicable, lifestyle diseases mainly due to improvement in living standards and medical technology.
4. The loss of one DALY can be considered as the loss of one full year of healthy life.

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POPULATION CHANGE AND ITS IMPACT ON THE ENVIRONMENT IN MALAYSIA

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Abstract

In a finite world, there are environmental limits to growth which demand a serious rethinking of population issues. This chapter surveys the ways population processes interact with environmental change in the context of Malaysia. An important feature of Malaysia's development process is its rapid urbanisation. Urban growth and the pattern of population distribution have accentuated Malaysia's environmental problems. With development, natural ecosystems are increasingly replaced by urban regions with negative impacts such as environmental pollution derived by intensive material flows, damaging changes in land use, loss of biodiversity, habitat fragmentation and a decline in ecosystem services. In some parts of the country Malaysians tend to overcrowd and over consume following the trajectories of the rich societies in the North. Beyond this Malthusian perspective, the chapter also discusses the interplay of population–environment issues in Malaysia which include population encroachment into environmentally-sensitive areas, displacement of forest-dwelling peoples, and high-density urban living. The chapter concludes with a set of five recommendations to address the population growth and its future impacts.

Introduction

Human influence on the earth's ecological footprint was negligible for thousands of years until population numbers started to increase dramatically (Dietz *et al*., 2007). For instance, prior to the Industrial Revolution, the

forests of many European countries were cleared mainly for subsistence, with little effect on functioning of the ecosystem. By the late 17th century, the fall in mortality and higher birth rates had catalysed the spread of settled agriculture resulting in a rapid decline in Europe's forest cover. The population growth also triggered migration within Europe. When some natural resources fell into short supply, European powers started to search other parts of the "New World" (Grove, 1995). These explorations later resulted in migration not just for subsistence, but also for settlement, agriculture and industry.

In contrast to Europe, parts of Asia have been densely populated for a longer period. In the year 1700, population estimates for the South Asian region were upwards of 146 million people (Goldewijck, 2005). However, over the 18th century, the population increased modestly to only 176 million in 1800 (out of 1 billion world population), and then population growth accelerated to reach about 325 million in 1900, 486 million in 1950 and 1,357 million in 2000 (Goldewijck, 2005; Goldewijck *et al.*, 2010).

Between 1960 and 2012, the global human population more than doubled, from three billion to over seven billion, while the size of the world economy increased by sevenfold (Crist and Cafaro, 2012). By 2050 that number is projected to expand to 9 billion people, despite the fall in fertility. More babies, children, and adults have survived because of improved nutrition, vaccination, and better hygiene. The explosion of humanity has decimated many animal and plant populations, impacting biodiversity, and causing the deterioration of many ecosystems services. Leading scientists coined the term "Age of the Anthropocene", whereby the human species has become a powerful geological force in its own right (Crutzen, 2002; Steffen *et al.*, 2007).

This chapter seeks to contribute to a better understanding of the ways population processes interact with environmental change in the context of Malaysia. The first section sets the scene by outlining the conceptual aspects of population–environment nexus. The section that follows analyses population change and urbanisation in Peninsular Malaysia by focusing on the case of an emerging mega-urban region of Bernam-Linggi. Next, the chapter suggests seven ways how urbanisation and population change have impacted Malaysia's development. This is followed by a discussion on the interplay of population–environment issues in Malaysia beyond the common Malthusian perspective. The chapter concludes with a set of five recommendations to address the population growth and its future impacts.

The Nexus of Population and Environment

Conceptually, the growth figures above assume a direct, causal and deterministic relationship between population and the environment. This view is known as Malthusian, whereby population growth is perceived to cause environment depletion because more people exert higher pressure on the environment through their consumption activities. If left unchecked, unsustainable patterns of consumption and production will lead to ecological catastrophe (Malthus, 1798; de Sherbinin *et al*., 2007). According to this view, population growth in developing countries is regarded as a major cause for ecological degradation and natural resource depletion. The policy prescription is to urgently reduce population growth through fertility reduction in the South through population policies (Matthews, 1989).

There are at least two alternative views to the mono-causal Malthusian idea – the *multiplicative* approach and the *mediating* perspective. In the multiplicative approach population is central, but linked to economic activities and technological factors associated with sustainable development. The most common formulation is the identity I = P*A*T. In this scheme, environmental impacts (I) are the product of population (P), affluence (A), and technology (T). IPAT models of "sustainable development" focus on reducing population pressure on the environment through improved technologies (Ehrlich and Holdren, 1971).

The mediating perspective argues that factors such as policy context, institutions, market, science and culture link population factors with environmental outcomes. Also influential are local- or region-specific dynamics and the view that population–environment relationships do not happen in a vacuum. These mediating factors deny the existence of a direct, causal relation between population and environment (de Sherbinin *et al*., 2007).

As opposed to the Malthusian view of exponential population growth outstripping food production capabilities, the Boserupian hypothesis holds that agricultural production increases with population growth owing to the intensification of production (greater labour and capital inputs) (Boserup, 1965). High fertility in traditional societies is seen as beneficial to older generations, owing to the net flow of wealth from children to parents (Caldwell, 1982). Also, high fertility is seen as a traditional adaptation to peak labour demands during the short cropping season. While Malthus viewed technology as being exogenous to the population–resource condition, Boserup viewed it as endogenous.

Much attention was paid internationally to the world's "population explosion" in the 1960s and 1970s.[1] Proponents argue that because individuals simply could not act in the best interests of society, governments must intervene to appropriately manage the commons beset by rapid population growth. Many social scientists rejected such a Malthusian view because of its underlying biological or ecological underpinnings (de Sherbinin *et al.*, 2007). Implicit is the assumption that humans are similar to other species that are unable to grow beyond their local "carrying capacity". This view neglects the fact that cultural adaptation, technological developments, trade, and institutional arrangements have enabled human populations to grow beyond their local subsistence base.

In 1994, the United Nations International Conference on Population and Development (ICPD) in Cairo, removed the population subject from the global policy discourse. This, by extension had also silenced the population–environment nexus for four reasons (Campbell, 2007). First, population growth has always been a sensitive subject in many countries. It involves religion, reproduction, and severe inequities across the world. The Catholic Church, for instance, considers contraception a sin, while abortion is legal in some Muslim countries such as Tunisia and Turkey (Collins, 1995).

Second, many social activists became upset by India and China's population stabilisation policy, calling it "coercion" (Stycos, 1991). One hundred seventy-nine countries joined the ICPD consensus, agreeing that they had a collective duty to respect and promote the right of their respective populations to decide their own reproductive outcomes, to improve their health and wellbeing, and to distribute such wellbeing more equitably among the world's many inhabitants.

Third, drawing attention to any connection between population growth and environmental destruction was deemed taboo, as it was seen as disadvantageous to women's ability to decide on how many children to have (Campbell, 2007). The language of family planning and birth control in population programs was overtaken by a more comprehensive notion of reproductive health which was based on individual rights and empowerment of women (Chapman, 1999). This broader approach includes not only family planning, but maternal and infant health, prevention of gender-based violence, and the prevention and treatment of sexually transmitted infections. Going beyond the achievement of demographic objectives, and parting with the numbers-driven neo-Malthusian policies and programs, the

post-ICPD discourse embraced an individualistic tradition, where freedom, autonomy, capacity and desire were given more policy emphasis.

Fourth, the population–environment nexus invites tension between North and South over the justice issue. For instance, does a rich Northern country, which emits a hugely disproportionate amount of greenhouse gases, have a right to suggest that Southern countries reduce their rates of population growth in order to compensate for consumptive lifestyles of the Northern population?

Because of the complexity of population interactions as well as political issues, population issues were not considered in formulation of the Kyoto Protocol and have also been largely excluded from the Intergovernmental Panel on Climate Change (IPCC) assessment reports. Some scientists and activists see the current attention to the issue of climate change as an opening in which to make the case that global warming cannot be alleviated or reversed without slowing population growth (Pielke and Sarewitz, 2005; Petroni, 2009). They believe that linking population growth and climate change will help governments to see the urgency of the matter, and will place family planning back into the political realm as a matter of national and environmental security. They see evidence that population growth, both in industrialised and developing countries, as a contributing factor, especially so when consumption is considered the primary driver of environmental degradation and climate change.

The Spatiality of Population Change – the Malaysian Case

Urbanisation has been one of the most prominent trends of the 20th and 21st century. By 2050, the United Nations project that two in every three persons, or 69% of world population will live in cities in Asia and Sub-Saharan Africa (United Nations, 2010). The benefits of urbanisation for economic growth are well known. As a dynamic process, it brings better infrastructure and economic opportunities to meet the needs of an increased urban population.

This phenomenon is present in Malaysia despite the fact that it is not beset by high overall population densities. An important feature of Malaysia's history is its rapid urbanisation, increasing from 26.8% in 1970 to 70.9% in 2010 (Abdul Rahman and Prema, 2014). The future seems more challenging since small towns and cities are growing outwards of their individual boundaries to merge into each other and form huge

conurbation of urban centres or mega-urban regions. Natural ecosystems are increasingly replaced by urban regions with negative impacts such as environmental pollution derived by intensive material flows, dramatic changes in land use, loss of biodiversity, habitat fragmentation and a decline in ecosystem services.

Urbanisation and Industrialisation

The population of Malaysia multiplied in the order of 11 times over the past 110 years. Most nations in Southeast Asia recorded only around a 7-fold increase. According to the Department of Statistics, Malaysia's population will reach 38.5 million people by 2040. Driven by industrialisation since the 1980s, three quarters of the population now live in urban areas, and most are concentrated in a few cities.

A primary driver or Malaysian urbanisation is industrialisation which impacted Malaysian urbanisation in two ways. First, it was the founding of manufacturing areas in new neighbourhoods of existing cities or munici-palities and new towns with a strong industrial base. Second, it was massive rural to urban labour flows taking the form of daily circulation from rural *kampungs* or more permanent rural to city migration mainly to seize job opportunities in these industrial centres especially to fill up vacancies in the labour intensive industries (Nagata, 1974). As the urban population agglomeration took shape other supporting social infrastructures, facilities and amenities grew; from shelters to educational facilities – from primary schools to colleges and universities, health provisions, personal and family security, intra and inter-city mobility, recreational needs and so on (Brook-field *et al.*, 1991).

Following two decades of socio-economic and infrastructural develop-ment after Independence, Peninsular Malaysia began to witness the rise of relatively huge urban conurbations (Aiken and Leigh, 1975). Initially, these urban conurbations were the Klang Valley urban conurbation stretching from Kuala Lumpur, the national capital, to Port Klang covering about 50 kilometres from the main range to the coast (Saw, 1972). The second conurbation was the line of urban areas from Georgetown city, Seberang Perai industrial town across to Kulim industrial area, while the third urban conurbation then was in the Johor Baru Pasir Gudang urbanisation space. Over the years there were other much smaller urban conurbations centring on the state capitals.

All these urban regions were relatively small in population size by regional standards, offering a pale comparison to the mega urban regions seen in Southeast Asia such as Jakarta in Indonesia, and Bangkok in Thailand, let alone those in China. These mega urban regions record a total population of more than twenty million people, and are characterised by not only economic prosperity for some but also overcrowding, urban poverty, and pollution. The largest Malaysian urban region, the Klang Valley today has about six million people.

The Kuala Lumpur Extended Mega Urban Region (KLEMUR)

Most modern urban centres in the Kuala Lumpur Extended Mega Urban Region basins were founded during the British colonial intervention in Perak state – where the Bernam basin is, in Selangor in which at least three major basins are to be found, and the Linggi basin in Negeri Sembilan around the 1874 to 1900 period. An insight into the size and distribution of urban centres during the period is afforded by the size distribution of urban centres in 1891. Except for Kuala Lumpur the rest of the urban centres were small and somewhat isolated from each other except for the connecting main trunk road linking each other (Figure 11.1).

Perhaps the generalisation that urban centres were mainly peopled by Chinese migrants as shopkeepers and providers of other basic services could very well have started from this early urban population landscape in the 1930s. The local people remained in their *kampungs* and were peripheral to the urban life then. Over the years these urban centres grew in size through population increase mainly by migration and high fertility level prevailing at that time. Being the capital of Selangor state Kuala Lumpur grew substantially compared to the other urban centres. Commercial and services functions grew with population increase. The urban growth patterns continued to change slowly as shown in the census after the war in 1947 (Figure 11.2). War destruction and much uncertainty during World War II (1939-1945) contributed to the slow growth of these urban centres.

By the Census in 1947, the area covering Kuala Lumpur and south to the Seremban–Port Dickson area had begun to form a clear urban belt, centring on the main north-south trunk road. These urban centres and towns dotted the largely agricultural rural areas. Rubber estates along the north-south stretch were the epitome of modern commercial agriculture

Figure 11.1: Population in Bernam-Linggi Basin, 1891
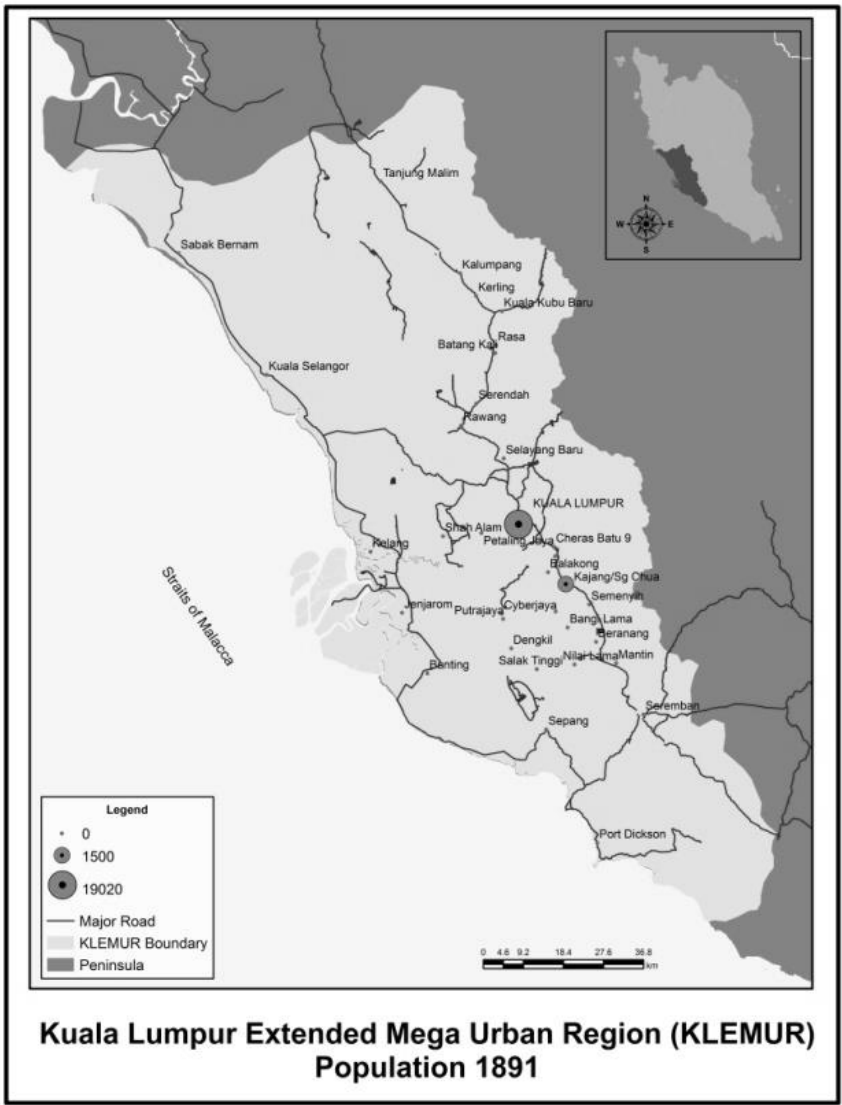
Kuala Lumpur Extended Mega Urban Region (KLEMUR)
Population 1891

Source: Geographic Information System (GIS) Analysis; Population and Housing Census.

Figure 11.2: Population in Bernam-Linggi Basin, 1947
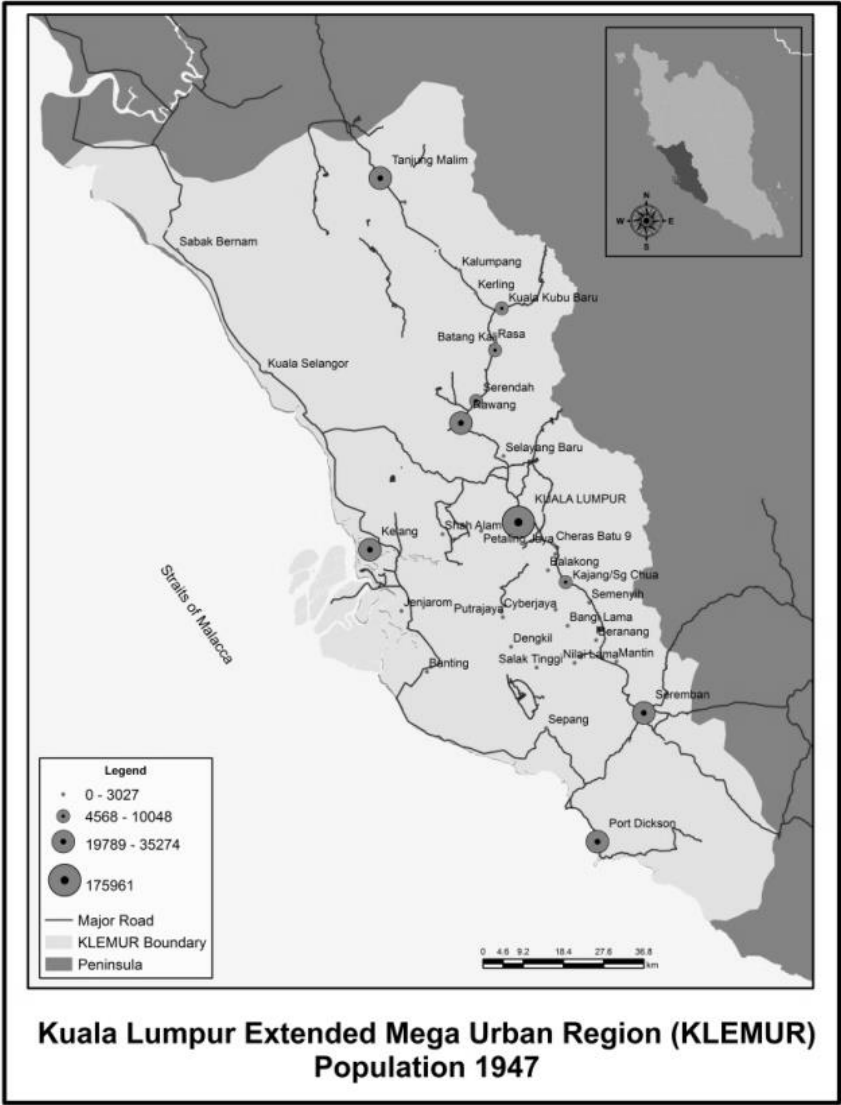
Kuala Lumpur Extended Mega Urban Region (KLEMUR)
Population 1947

Source: Geographic Information System (GIS) Analysis; Population and Housing Census.

Figure 11.3: Population in Bernam-Linggi Basin, 1970
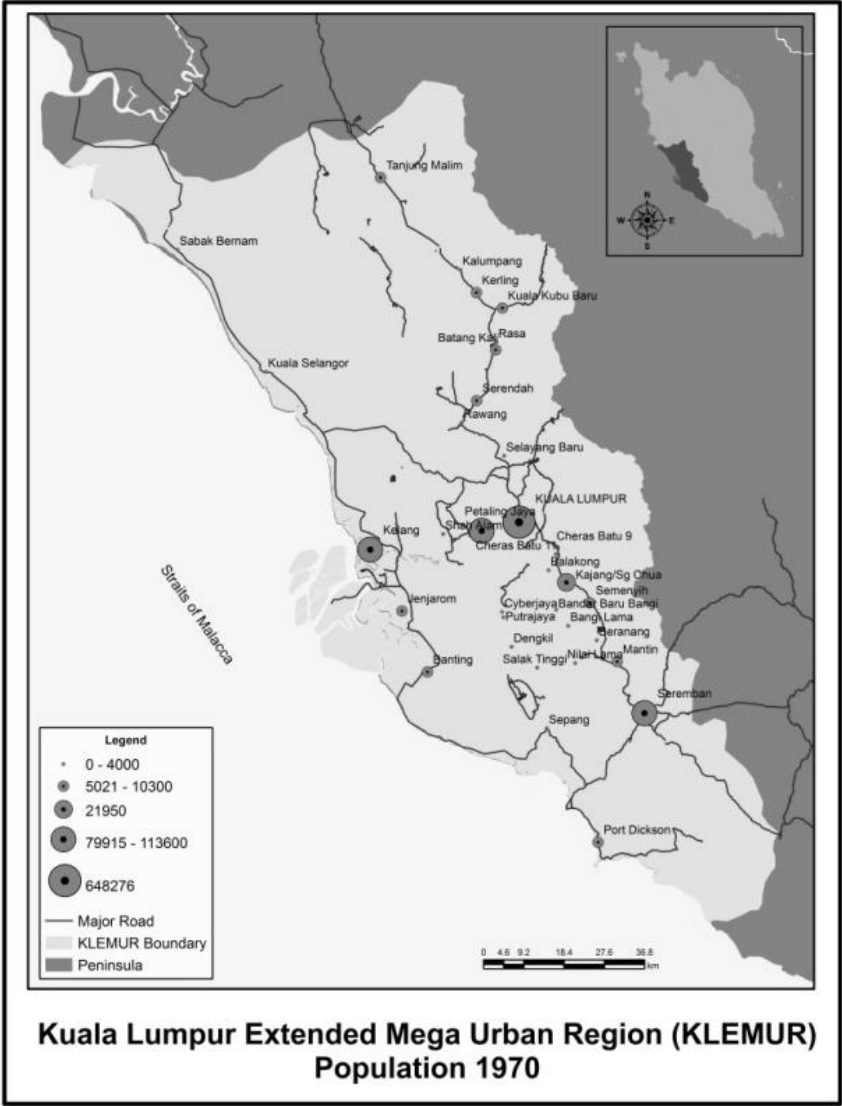
Kuala Lumpur Extended Mega Urban Region (KLEMUR)
Population 1970

Source: Geographic Information System (GIS) Analysis; Population and Housing
Census.

Figure 11.4: Population in Bernam-Linggi Basin, 2000
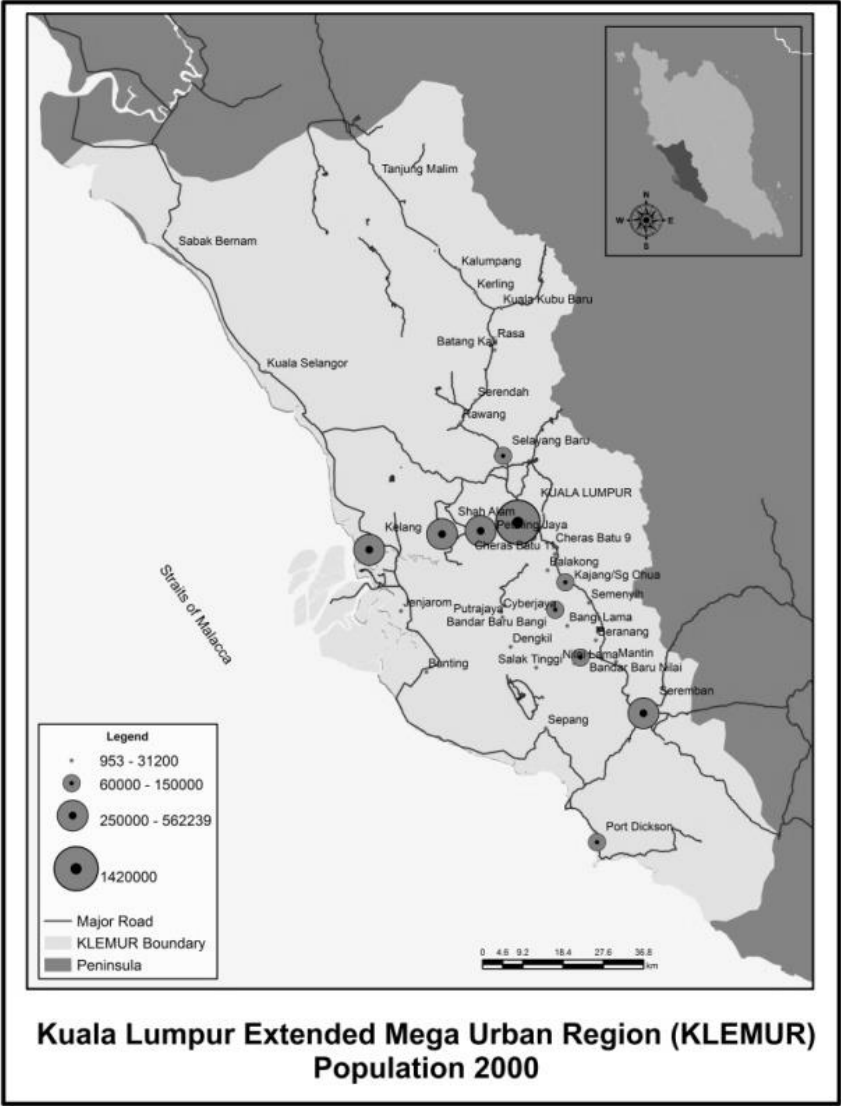
Kuala Lumpur Extended Mega Urban Region (KLEMUR)
Population 2000

Source: Geographic Information System (GIS) Analysis; Population and Housing Census.

Figure 11.5: Population in Bernam-Linggi Basin, 2010

Kuala Lumpur Extended Mega Urban Region (KLEMUR)
Population 2010
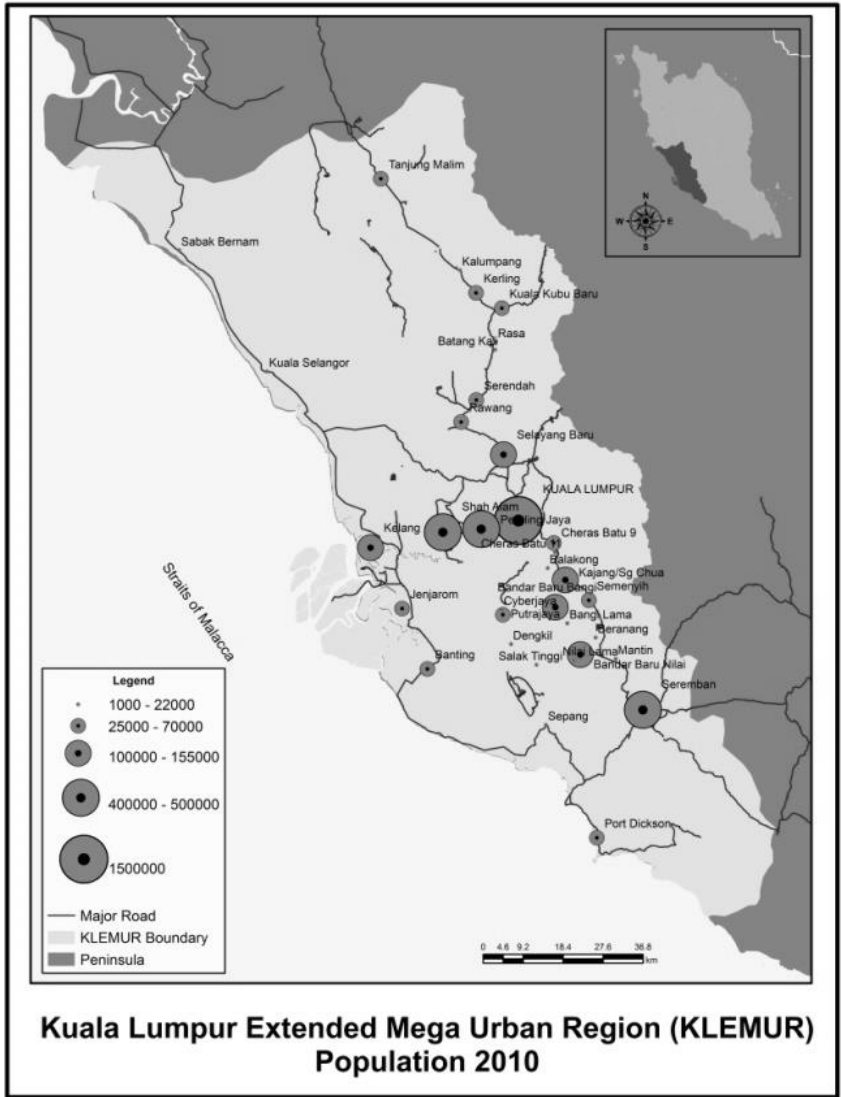
Source: Geographic Information System (GIS) Analysis; Population and Housing
Census.

existing next to traditional villages. Each urban centre seemed to be isolated from the other and there was a noticeable break separating one urban centre from the other.

On the eve of Independence, the emerging urban belt bordering Kuala Lumpur and Seremban had become more marked. Kuala Lumpur developed further. A small urban conurbation was developing linking the capital to the Petaling Jaya new town – founded in 1953 (McGee and McTaggart, 1967). Overall the framework for a huge urban belt was in place (Figure 11.3).

In the post Independence years the existing urban centres continued to grow, most markedly in the Klang Valley centring on Kuala Lumpur and Petaling Jaya new town. The urban centres in the Kuala Lumpur Extended Mega Urban Region continued to experience rapid growth (Figure 11.3). New towns in the Klang Valley too grew rapidly due to labour migration in response to job opportunities in the manufacturing industries in Petaling Jaya and newer towns right up to the old Klang town west of Petaling Jaya. The urbanised frontier was moving west to Klang town and beyond to Port Klang. By the 1970s, Kuala Lumpur and Petaling Jaya began to dominate the urban landscape; a primacy was in the making for the Kuala Lumpur Extended Mega urban landscape (Figure 11.4).

By the 1990s, economic stability and an excellent transportation network had established Malaysia as one of the preferred destinations for foreign investments. The availability of relatively better educated skilled labour in large numbers brought labour intensive manufacturing industries into the country. The established cities, municipalities and towns with the basic infrastructures were chosen to host the industries. In addition specifically created industrial neighbourhoods and new towns were planned and developed. Throughout the 1980s, starting from Kuala Lumpur to Port Klang on the coast and Seremban to the south, industrial neighbourhoods emerged to replace the agricultural landscape. In the meantime, the manufacturing industrial frontier was also moving north from Kuala Lumpur to the Bernam basin where the national car industry, Proton, has a commanding area in the urban landscape. At the small town of Serendah another automotive assembly plant has been producing another well-known local car. In almost 40 years the Bernam-Linggi river basin had merged into a huge urbanised area replacing the widespread agricultural landscape earlier (Figure 11.5). It is now expanding in size to meet the growing needs for more settlements, roads and other infrastructures.

Environmental Impacts of Population Change

Consumption is clearly the primary driver of environmental degradation, while population growth, both in industrialised or developing countries, is a contributing factor. Malaysia's per capita consumption of resources such as water and energy are on a steady climb concomitant with the country's economic progress. The country's earlier economic rise was made possible by its rich natural resources such as tin, petroleum and timber together with agricultural commodities like rubber and palm oil (Aiken *et al*. 1982; Vincent and Ali, 1997). Figure 11.6 illustrates the country's material flow from 1970 to 2008, indicating that consumption and production patterns of natural resources and minerals have been increasing steadily throughout the years.

As an outcome, the state-of-the environment is altered from a pristine nature to a modified human landscape in just one century. The provision of environmental goods and services by the natural ecosystems is compromised as a consequence of rapid development. Indicators of unsustainability include escalating per capita CO_2 emission from 1.3 metric tons per capita to 7.7 in 2010 (World Bank, 2013), water supply disruptions, unchecked forest conversion to agricultural and urban landscapes, poor river water quality, inefficient waste management and declining food security.

Figure 11.6: Material Flow Malaysia, 1970-2008
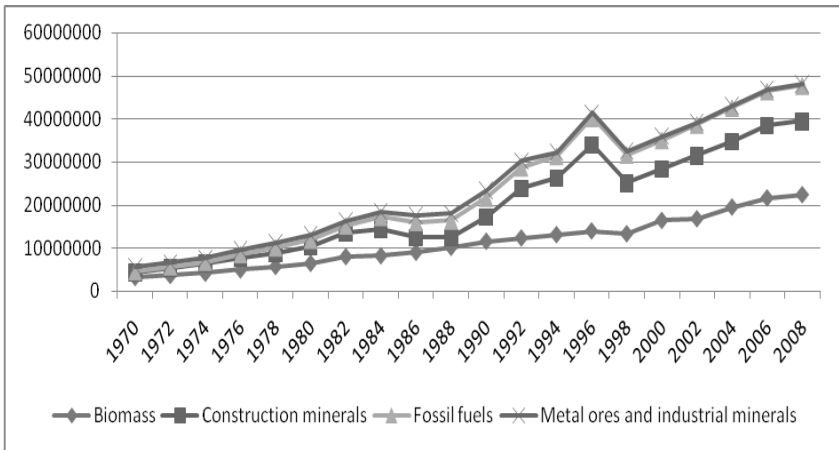
Source: Commonwealth Scientific and Industrial Research Organisation (CSIRO) and United Nations Environment Programme (UNEP) databases, 2010.

Greenhouse Gases (GHGs) Emissions

On the 2010 Climate Change Performance Index, which rates the emission levels, emission trends and climate policies of the world's 57 largest carbon dioxide emitters, Malaysia appeared in the bottom-ranked group of countries alongside countries like Canada, Australia, the USA and Saudi Arabia. The energy sector alone accounted for 66% of total emissions in 2000, with transportation and manufacturing sectors as the second and third largest emitter. The total GHG emissions are projected to increase from 223.1 $MtCO_2$ equivalent in 2000 to 375.4 $MtCO_2$ equivalent in 2020 (Ministry of Natural Resources and Environment, 2011). Malaysia's increasing per capita energy use will result in over consumption that will end its energy-exporting status. Malaysia's total final energy demand is expected to almost double from 47 million tons of oil equivalent (Mtoe) in 2010 to almost 93 Mtoe in 2030 (Asia Pacific Energy Research Centre, 2009). The total primary energy supply is projected to more than double from 66 Mtoe in 2005 to 130 Mtoe in 2030, and fossil fuel is expected to constitute more than 90% of the total primary supply. In 2001 the government introduced the Five-Fuel Policy to encourage the utilisation of renewable energy (RE) resources for power generation. To fast-track the implementation of the Five-Fuel Policy, the Small Renewable Energy Power Program (SREP) was introduced in the same year. This program allowed utilisation of all types of RE sources, including biomass, biogas, municipal solid waste, solar, mini hydro and wind. However, the low take-up rate of RE development under the SREP led to the formulation of the Renewable Energy Act 2010. The Renewable Energy Act 2010 provides for the establishment and implementation of a Feed-in-Tariff (FiT) system to catalyse the generation of renewable energy.

Water Resources

The perceived abundance in Malaysia's water resources had resulted in inefficiency in water usage. A survey jointly undertaken by the Federation of Malaysian Consumers Associations (FOMCA) and the Energy, Green Technology and Water Ministry found that Malaysians use an average of 226 litres of water a day, compared with 155 litres and 90 litres in neighbouring countries Singapore and Thailand respectively. This was much more than the 200 litres per capita per day recommended by the United Nations. It was estimated that only 80 litres of water a day is required, pointing to a possible

saving of up to 136 litres per person (Salleh *et al.*, 2010). Water supply disruptions have become more frequent in recent years. Despite abundant water resources, various parts of Malaysia have experienced shortages in water supply due to increased demands and changing weather patterns as well as technological issues such as leakages. The water crisis in Selangor from March to May 2014 has caused multi-million Ringgit losses to over thirty companies in the state (Zachariah, 2014). A report by the National Water Services Commission projected that demand for water will outstrip supply in the most densely populated regions in Malaysia (Selangor, Kuala Lumpur and Putrajaya) unless actions are taken (National Water Services Commission, 2012).

Minerals

There are indications that resources scarcity globally has led to renewed importance of natural resources to Malaysia's economy (Hezri and Alizan, 2015). For instance, whilst mining is often seen as a sunset industry, and the importance of mining to the overall economy of Malaysia has declined, the extraction of some minerals has seen a resurgence recently. Iron ore for example, has seen an increase of 934% in production from 1990 to 2010, including a rapid 275% rise from 949,605 tonnes in 2005 to 3,557,813 tonnes in 2010 (Department of Statistics, 2011). Iron ore is bringing huge returns to state governments. In 2011 the Pahang government received royalties amounting to RM5.5 million in just four months, while the Kedah government received RM10 million in a year (Hezri, 2013). Extractive industries are known to be environmentally damaging if stringent law enforcement is not put in place.

Pollution

Urbanisation and industrialisation pressures continue to threaten the environmental quality in Malaysia. In 2011, the Department of Environment reported that 39 rivers were polluted, 3,177 open burning cases were lodged, and about 12 illegal disposals of scheduled wastes were still practiced by unscrupulous offenders (Department of Environment, 2012). Within the Kuala Lumpur Extended Mega urban region, air pollution is on the increase in recent years. The air pollution level in the congested and traffic heavy municipality of Petaling Jaya records a high concentration of particulate

matter (PM10) pollutant from industries and NO_2 gas from motor vehicles (Azmi *et al.*, 2010). Fast-developing towns such as Kajang and Nilai are found to have high concentrations of air pollutants originating mainly from exhaust systems of motor vehicles (Latif *et al.*, 2011). This is hardly surprising as the country's road transport vehicles have increased from 6.8 million in 1995 to 18 million in 2008 (Ong *et al.*, 2011). Both urban air pollution and river pollution will cause long- and short-term impacts on human health and wellbeing.

Biodiversity

Ensuring the survival of biodiversity in protected areas (e.g. national parks) alone is insufficient for conservation, especially under the condition of incessant habitat loss due to pressures from expansion in human settlements and agriculture. Although Malaysia embraces biodiversity conservation, protected areas serve only as surrogate indicators for biodiversity conservation. A study by Reza and colleagues (2013) revealed that a number of protected areas in Peninsular Malaysia are unsuitable for large mammals with big home range. Some mobile species such as elephants often move outside of protected areas, resulting in conflicts with humans. In this regard, these protected areas do not function effectively as tools for conservation. Worse, the most biologically diverse areas, the lowland dipterocarp, have been excised for development long ago, whereas most protected areas are located at higher elevation with lesser constituent species to begin with. Policy reversal on protection status also threatens the efforts of biodiversity conservation. Since the1960s, backed by powerful vested interests, a number of key wildlife protected areas have been rescinded to give way to agricultural land use in Peninsular Malaysia (Abdullah *et al.*, 2014).

Municipal Solid Waste

The increase in Malaysia's population has resulted in a tremendous amount of municipal solid wastes being generated. In Peninsular Malaysia, the daily generation of waste escalated from 13,000 tonnes in 1996 to 19,100 tonnes in 2006, an increase of 91% in just one decade (Agamuthu *et al.*, 2009). A survey on waste management issues showed that 59% of respondents were moderately aware with some basic knowledge and were mildly concerned with solid waste issues (Hassan *et al.*, 2000). This may come as a surprise

to some because as much as 50% of public complaints lodged to the government are on waste and cleanliness issues. Dumping of wastes in open fields and rivers by industries and households is still common today. A study of waste disposal behaviour in the low income areas in Kuala Lumpur disclosed that 31.9% of waste were disposed by open burning, while 6.5% were thrown into the river system (Murad and Siwar, 2007). This situation is different from that in developed countries where the goal of sanitation and the objective of collection and disposal, even though not infallible, are generally considered as a thing of the past.

Food Security

The land use for agriculture in Malaysia is geared to producing commodities for export rather than to fulfil the food requirements of the nation. With an annual growth of 5.9%, areas under oil palm in Malaysia increased from 641,791 hectares in 1975 to 5.0 million hectares in 2011 (Malaysian Palm Oil Board, 2013). By 2012, oil palm plantations occupy 15.4% or 5.08 million hectares of Malaysia's land mass. In comparison, areas under paddy cultivation comprise only a meagre 672,000 hectares located in eight granaries (Fahmi *et al.*, 2013). As a result, although Malaysia is self-sufficient in palm oil and other commodities, the level of self-sufficiency for sugar, rice, and vegetables as well as beef, mutton and dairy products is very low (Rahman, 1998). The Food Price Crisis in 2007/08 has exposed Malaysia's vulnerability as a net rice importer when major producers such as Thailand and Vietnam decided to curtail their exports to ensure domestic food security (Tey and Radam, 2011). There is a need for Malaysia to boost domestic rice production by expanding the paddy areas to ensure greater self-sufficiency level.

The Interplay of the Population–Environment Nexus

A glance at Malaysia's population statistics (e.g. population size, growth, density, age and sex composition, migration, urbanisation, vital rates) will not sound an alarm for any demographer or policymaker. Malaysia is a not a population hotspot of the scale and magnitude of Indonesia and the Philippines. But with rapid urbanisation came a new set of sustainable development problems. Its urban population is faced with emerging problems as discussed in the preceding section and the list of challenges

is growing. The government has been trying to manage environmental challenges with numerous policies since the 1970s (Hezri and Hasan, 2006; Sani, 1993). Table 11.1 lists a suite of environmental and natural resources policies and how they relate to population issues.

Table 11.1: Environment and Natural Policies and Links to Population Issues

National Policy	*Implications for Environment–Population Nexus*
National Policy on Biological Diversity, 1998	The policy recognises the role of local communities in the conservation, management, and the utilisation of biological diversity as well as their rightful share of benefits.
National Environmental Policy, 2002	Its goal is a clean, healthy, safe and productive environment for the current and future generations involving active participation of all sectors of society through conservation and sustainable consumption and production.
National Urbanisation Policy, 2006	The policy links the high rate of population increase to the need for the development of new areas for housing, social amenities, commercial and other urban land uses. It also stated that the lack of clear urban limits has led to the creation of urban sprawl encroaching upon environmentally sensitive areas and major agricultural areas.
National Green Technology Policy, 2009	One of its four objectives is to ensure sustainable development and conserve the environment for future generations. The policy emphasises uptake of green technology by the Malaysian society.
National Water Resources Policy, 2012	One of the guiding tenets is "Water for People", providing for universal access to safe, adequate and affordable water supply, hygiene and sanitation.
National Physical Plan 2, 2013	The plan aims to rationalise and consolidate the national spatial planning framework: to promote more balanced regional development by enhancing spatial and environmental quality, diversity and safety for a high quality of life and liveability. It also aims to facilitate efficient integrated inter-state connectivity and public common users' space provision for social interaction and sustainable communities.

Despite the constellation of policies and programs on the environment by the government, in reality it is extremely hard to bridge the gap between stated policy goals and practical strategies to achieve those goals. An evaluation of Malaysia's record in implementing the United Nations' Agenda 21 on recommendations for the environment – agreed in Rio de Janeiro in 1992 – was prepared by a consortium of Malaysian NGOs for the 2002 World Summit on Sustainable Development. It concluded that:

> In essence, the words are in the right place but in truth the actions are not. The commitment and focus to implement sustainable development practices is not forthcoming.
>
> (Malaysian NGO Forum for Rio+10, 2003)

The main difficulty in enforcing these policies is overcoming the distinctly resilient patterns of production and consumption associated with conventional paths of economic development. Obstacles in moving toward sustainable development are many, but four are worthy of mention (Hezri, 2014; Hezri and Dovers, 2012). First, natural resources in Malaysia are under priced through subsidies including water, fuel, and paddy seed, to name a few obvious examples. Rather than reduce its consumption of resources to a sustainable level, Malaysia continues to consume more resources than many of its peers. Second, Malaysia continues to be bedevilled by the problem of disconnect between federal policies and state jurisdiction. Environmental policy is mainly a federal jurisdiction, but land encompassing agriculture, forestry, mining and water is a state jurisdiction. The power of the states over land has constrained national policymaking. Third is the general apathy among the public about the environment and sustainability. Malaysians generally lack understanding of the underlying causes of environmental problems resulting in wastage of resources and polluting behaviour. The fourth obstacle has to do with the performance of the delivery system of the public service. Although the economy and the environment are interdependent, planning has been formulated in silos, leading to fragmentation of regulation and implementation.

In the future, more natural ecosystems will be replaced by cities to accommodate the growing urban population and industries. Hence there will be more pressure on the environment with consequences on the wellbeing of the Malaysian population. At the national and subnational levels, attention should be paid to the nuance of interplay between population dynamics and emerging environmental challenges. As a future policy and research agenda, we should ask how do specific population

changes (in density, composition, or numbers) relate to specific changes in the environment (such as deforestation, climate change, or ambient concentrations of air and water pollutants)? In other words, we need to unpack and disaggregate population dynamics (e.g. in density, composition, numbers, sex/age structure, and life histories) in empirical studies to prepare for appropriate policy responses. In what follows, we outline three areas for further enquiry.

Encroachment into Environmentally-sensitive Areas

Population growth in the rural areas in the 1960s and 1970s as a result of land resettlement has contributed to significant deforestation (Nagata, 1974). The area of arable land increased fivefold between 1900 and 1950 as forested land gave way to agriculture and rubber plantations. Later on, the Federal Land Development Authority was the dominant agent of change, converting more than 100,000 hectares of forested land annually from the mid-1950s until 1965 (Goh, 1982). In 1966, 9 million hectares of Peninsular Malaysia's total land area of 13.3 million hectares was under forest cover (Ooi, 1976). By 1977 this had declined to 7.2 million hectares (Rowley, 1977). More recently, the Millennium Development Goal indicators showed that the proportion of land area covered by forest has dropped from 68.2% in 1990 to 62.4% in 2010 (Hezri, 2013; EPU and UNCT, 2010). Thus, Malaysia has not achieved the MDG target of reducing the rate of loss of forest cover.

The agricultural frontier had then advanced in areas that are environmentally sensitive. The ecological effects of land clearing included high sediment loads in rivers from soil erosion and the pollution of river systems with effluent discharged from rubber and palm oil mills. Another impact of human migration was the increasing conflicts between wildlife and rural population as the natural habitat for these animals has been encroached for agriculture. During the period 1998 to 2005 the average number of reported human–elephant conflicts is 731 incidents per year, with crop damage accounting for 72% of the cases (Poh and Othman, 2008). Removing or trans-locating a "problematic" elephant usually cost around RM40,000. Agriculture and human settlement have pushed the boundary of natural areas in Malaysia to only four large islands of forests which are fragmented and disconnected. The Central Forest Spine is a government initiative to protect the backbone of Peninsular Malaysia from development encroachment that will further threaten wildlife and human populations.

Displacement of Forest-dwelling Peoples

Logging and infrastructure projects such as hydropower development have also affected the wellbeing of forest-dwelling communities. There are many instances where land alienation and other forms of socio-economic marginalisation have undermined the population and identity of Malaysia's indigenous tribes. The plight of the Penan in the 1980s due to unscrupulous logging practices in the state of Sarawak has attracted worldwide attention (Brosius, 1997). Subsequent to that, the resettlement of indigenous tribes in Kampung Asap to accommodate the construction of the Bakun hydropower dam has also caused a lot of grief. Gone with their sense of place was the sense of identity loss when they are forced to leave behind their traditional agricultural practices. There is also evidence that the indigenous peoples do not play a significant part in the timber industry or palm oil. For the industries, cheaper labour from neighbouring Kalimantan makes a better business sense than employing the locals.

In Peninsular Malaysia, the return to resource extraction is causing great strife among the affected communities. Environmental degradation has persisted amidst increasing land scarcity. This in turn has resulted in resentment brewing among the public (Hezri and Alizan, 2015). Unprecedented environmental protests have occurred, such as against the siting of an iron ore processing plant in a biodiversity hotspot in Perak, forest clearance for agriculture in Cameron Highlands (Lai, 2013) and the mining of iron ore around Lake Chini, the only UNESCO Man and Biosphere Reserve in Malaysia (Hezri and Chan, 2012).

High-density Urban Living

The Malay Peninsula, Sabah and Sarawak were only sparsely populated before the colonial intervention. The flood plains of Thailand and Myanmar or the fertile volcanic soils of Java in contrast have developed a substantial population density for thousands of years.[2]

The population density for Malaysia in 2010 stood at 86 persons per square kilometre. But the density varies widely from 6,891 persons per square kilometre in the Kuala Lumpur Federal Territory, 205 persons in Kedah, and to 20 persons in Sarawak. Other high density states include Penang (1,490 persons) and Putrajaya Federal Territory (1,478 persons). Selangor despite being the most populous state records only a density of 674 persons per square kilometre. Although not as dense as other capitals, Kuala

Lumpur has experienced strong growth since the last century. From a mere 900,000 population in 1950, the number of its residents more than doubled by the 1980s. With more economic opportunities in these three decades, the population in 2010 had tripled from its 1980 level to 6 million. By 2030, it is estimated that Greater Kuala Lumpur will be home to 10 million people (PEMANDU, 2010).

In many dense cities, the social life of a population is disintegrated and replaced by maladies such as increased anxiety, mental disorder, family breakups, crime, and violence.[3] Some signs suggest that the Klang Valley city dwellers are yet to develop sufficient adaptation capacities to live in a high-density environment. One example of the pathology of high-density living is the public nuisance of double-parking in the city and its suburbs. Another indicator is the increasing trend of road rage or aggressive be-haviour on the roads.

A balanced approach involves complementing physical or "hardware" improvements with the cultivation of collective ethics or "heartware". High urban density is tolerable only if civility and regulations mediate social relations in the city. Managing common resources such as streets, parks and rivers requires behaviour that maximise the gain for all and not individually. The city council on its part must modernise its regulations to permit social order in dense parts of Malaysian cities.

Concluding Remarks

There exists an uneasy relationship between population and sustainable development. On the one hand, population growth is always used as a proxy measure for social sustainability because data on population is readily available in contrast to other human variables such as values, culture and institutions. On the other hand, population policy prescriptions such as birth control are seen as antithesis to the rights-based approach to sustainable development. But in a finite world, there are limits to growth which demand a serious rethinking of population issues. As Malaysia eagerly joins the global economy it cannot continue to overcrowd and over-consume following the trajectories of the rich societies in the North.

The preceding discussion points to areas of action that are within the reach of government authority to influence through instruments of public policy. It also brings home the fact that the absence of population pressure akin to China and India for instance does not automatically eliminate

the importance of population policies that are sensitive to the needs of sustainable development. For instance, even if population growth is not the issue where people choose to live will influence the environment and the level of exposure to risk. Moving forward, the following actions may soften the impact of population growth on the environment in Malaysia:

- Establish a holistic land use policy which is based on river-basins rather than state administrative boundaries to ensure water, energy and food security for all;
- Strengthen the pricing mechanism for water and electricity supply to control unnecessary wastage by consumers;
- Synergise urban development especially for new housing and industrial estates with the carrying capacity of respective water catchments to avoid future water shortages;
- Empower the federal government to enforce environment-related legislations at the state and local levels especially in protecting environmentally-sensitive areas from illegal or legal-but-lethal encroachments; and
- Develop policy intelligence on the nexus between migrant workers dynamics and environmental change to understand the effects of their migration on Malaysia's human–environment systems, be they on socio-economic stratification, urban livability, gender dynamics, and cultural factors.

The convergence of population growth and global warming is likely to create immense challenges for Malaysia in the medium to long term. At the time of writing (December 2014), a significant part of the East coast of Peninsular Malaysia is submerged under water in arguably one of the worst episodes of flooding in the country. In the age of climate change the causes of flood disasters are no longer solely an act of God but also a result of man-made hazard due to uncontrolled land use. Without the political will to the above-mentioned actions, Malaysia's quest for sustainable development remains in serious jeopardy.

Notes

1. US President Nixon's on his 18 July 1969 speech announced the establishment of the Rockefeller Commission on Population Growth. The US State Secretary Henry Kissinger signed the National Security Study Memorandum (NSSM 200) in April 1974, calling for the United States to provide world leadership for population growth control (Collins, 1995).

2. In 2012, Southeast Asia's megacities of Jakarta and Manila, both clocked a whopping population of 26 million and 22 million respectively.
3. By far the world's densest urban areas are on the Indian subcontinent. Dhaka's density is 44,400 people per square kilometre.

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