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Population Dynamics and Sustainable Development in Indonesia

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Preface and Acknowledgements

As defined in the Rio+20 Conference, sustainable development means putting people at the centre of efforts to achieve "the future we want". As argued in this study, this means that population dynamics will play a strong role in reaching "the future we want" for Indonesia.In recent years UNFPA, as the United Nations agency with a focus on population, has been active in promoting research into the links between population dynamics and sustainable development, and the implications for policy and development planning, in line with post-2015 agenda. The 20-year review of the Programme of Action of the International Conference on Population and Development (ICPD), held in 2014, allowed UNFPA in Indonesia to examine emerging population and development trends now and in the future.

The Indonesia Case Study is a high-quality research paper that reveals population and development related issues in connection with sustainable development, or "the future we want". Population dynamics means going beyond the numbers to examine trends and changes in population growth, demographic structures and societal changes, including migration, urbanization, population density and age structures. Changes in the population size and structure affect various aspects of development, from economic, social and cultural aspects to politics, security and the environment.

The Indonesia Case Study research team, consisting of prominent Indonesian researchers, has identified three demographic megatrends, or phenomena related to population dynamics, that will emerge by 2030. The study shows that given these demographic megatrends, the path towards reaching "the future we want", or achieving sustainable development, will require a focus on the "triple-track" priorities of economic, social and environmental considerations, particularly in avoiding the upcoming challenge, the middle income trap.

It is with pleasure that we present this highly valuable piece of work, titled Indonesia Case Study: *Population Dynamics and Sustainable Development in Indonesia*. We hope that it will serve as a valuable reference for governments, policymakers, academicians, development partners, civil society organizations and other stakeholders in developing and implementing policies and programmes that will support Indonesia's future development.

The analysis presented in this publication, *Population Dynamics and Sustainable Development in Indonesia*, was prepared and co-authored by Professor Emil Salim (Advisory Council to the President), Professor Sri Moertiningsih Adioetomo (University of Indonesia), Dr. Evi Nurvidya Arifin (Institute of SouthEast Asia Studies), Professor Nizam (Ministry of Education), and Dr. Alvin Pratama (Advisory Council to the President). We would like to express our deep appreciation for their expertise and contributions to this study.

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Research Team Leader,

Professor Emil Salim

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ADB;	Asian Development Bank
AEC;	A SEAN Economic Community
AFC;	Asian Financial Crisis
AFTA;	ASEAN Free Trade Area
ASC;	ASEAN Security Community
ASCC;	ASEAN Socio-cultural Community
ASLUT;	Social Assistance for the Elderly / Asistensi Sosial Lanjut Usia
Bappenas:	National Development Planning Agency / Badan Perencanaan Pembangunan Nasional
BKB;	Under-five Faamily Education program / Bina Keluarga Balita
BKKBN ;	National Population and Family Planning Board / Badan Kependudukan dan Keluarga Beerncana
BMI ;	Body Mass Index
BPJS;	Social Security Organising Board / Badan Penyelenggara Jaminan Sosial
BPS;	Statistics Indonesia / Badan Pusat Statistik
BRIC;	Brazil, Russia, India, and China
CBS;	Central Bureau of Statistics
CCS;	Carbon capture storage
CEDAW;	Convention on the Elimination of Discrimination Against Women
CRC;	Committee of the Convention on the Rights of the Child
DM;	Diabetes mellitus
EPZ ;	Export Processing Zone
FAO ;	Food and Agriculture Organization
FDI;	Foreign Direct Investment
GenRe;	Generasi Berencana
GFSI ;	Global food security index
GHGs;	Greenhouse gas emissions
HEIs;	Higher education institutions
HFA;	Low height-for-age
HLPEP ;	High Level Panel of Eminent Persons
ICF;	International Classification of Functioning
ICPD;	International Conference on Population and Development
ICT;	Information, Communication, and Technology
IDHS;	Indonesia Demographic and Health Surveys
IFLS;	Indonesia Family Life Survey
IGI;	Indonesia Governance Index
ILO;	International Labor Organization
ISTWS;	Indonesian school-to-work transition survey

IT;	Information and technology
JKN;	National Health Insurance / Jaminan Kesehatan Nasional
JMA;	Jakarta Metropolitan Area (JMA)
KEN;	National Economic Committee / Komisi Ekonomi Nasional
KM ;	Knowledge management
KPK;	Anti-Corruption Committee
M&A ;	Merger and acquisition
MIT;	Middle-income trap
MOH/Kemenkes;	Ministry of Health / Kementerian Kesehatan
MOMT;	Ministry of Manpower and Transmigration
MRAs;	Mutual Recognition Arrangements
NCDs ;	Non- communicable diseases
NTA;	National Transfer Accounts
PBI;	Penerima Bayaran Iuran
PISA ;	Programme for International Student Assessment
PKH;	Conditional cash transfers/ Program Keluarga Harapan
PLN;	Listrik Negara
PNPM;	National program on community empowerment and other programs / Program Nasional Pemberdayaan Masyarakat
R & D;	Research and development
Riskesdas;	Basic Health Research / Riset Kesehatan Dasar
Sakernas;	National Labor Force Survey / Survey Ketenagakerjaan Nasional
SECI;	Socialization, Externalization, Combination and Internalization
SJSN;	Social Security System / Sistem Jaminan Sosial
STEM;	Science, Technology, Engineering, and Mathematics
SUSENAS	Indonesian national household surveys
TFP;	Total factor productivity
TIMSS;	Trends in International Mathematics and Science Study
TVS;	Technical and Vocational High Schools
UHC/JKN;	Universal Health Care / Jaminan Kesehatan National
UN;	United Nations
UNFPA;	United Nations Population Fund
WB;	World Bank
WFH	Weight-for-height
WFP;	World Food Programme
WHO;	World Health Organization

GLOSSARY

Age structure; the composition of a population as determined by the number or proportion of persons in each age category. The age structure of a population is the cumulative result of past trends in fertility, mortality, and migration. Information on age composition is essential for the description and analysis of many other types of demographic data.

Age Specific Fertility Rate (ASFR); is the number of births occurring during a specified period to women of a specified age or age group, divided by the number of person-years lived during that period by women of that age or age group.

Child marriage; defined as a formal marriage or informal union before age 18, is a reality for both boys and girls, although girls are disproportionately the most affected. Child marriage is widespread and can lead to a lifetime of disadvantage and deprivation.

Contraceptive Prevalence Rate (CPR); is defined as the percentage of married women age 15 – 49 who are currently using any contraceptive method. It is the ratio of the weighted number of women who are using contraception in an area to the weighted number of married women age 15 – 49.

Dependency ratio; is the number of dependents to every hundred productive persons, thus showing how many dependents are supported by one productive person.

Demographic transition; the historical shift of birth and death rates from high to low levels in a population. The decline of mortality usually precedes the decline in fertility, thus resulting in rapid population growth during the transition period.

Disability; The term persons with disabilities is used to apply to *all* persons with disabilities *including* those who have long-term physical, mental, intellectual or sensory impairments which, in interaction with various attitudinal and environmental barriers, hinders their full and effective participation in society on an equal basis with others. However, this minimum list of persons who may claim protection under the Convention does not exhaust the categories of the disabilities which fall within the it nor intend to undermine or stand in the way of wider definition of disabilities under national law (such as persons with short-term disabilities). It is also important to note that a person with disabilities may be regarded as a person with a disability in one society or setting, but not in another, depending on the role that the person is assumed to take in his or her community. The perception and reality of disability also depend on the technologies, assistance and services available, as well as on cultural considerations.

Educational attainment; Educational attainment the educational level completed by a person, verified with the receipt of a diploma or a letter of completion/certificate.

Gini ratio; Gini Ratio (Gini ratio) is a measure of evenness was calculated by comparing the area between the diagonal and the Lorenz curve (area A) divided by the area of the triangle below the diagonal. Purpose to measure the degree of inequality in the distribution of the population. Description Gini ratio value between 0 and 1.

Good governance; promotes equity, participation, pluralism, transparency, accountability and the rule of law, in a manner that is effective, efficient and enduring. In translating these principles into practice, we see the holding of free, fair and frequent elections, representative legislatures that make laws and provides oversight, and an independent judiciary to interpret those laws.

Human capital; is productive wealth embodied in labour, skills and knowledge.

Infant Mortality Rate (IMR); the number of infant deaths under one year old per 1000 live births in one year.

Inflation rate; is understood as a persistent, ongoing rise across a broad spectrum of prices. An increase in prices for one or two goods alone cannot be described as inflation unless that increase spreads to (or leads to escalating prices for) other goods.

In-migration; Every move is an in-migration with respect to the area of destination. An in-migrant is thus a person who enters a migration-defining area by crossing its boundary from some point outside the area, but within the same country.

International Conference on Population and Development (ICPD); The 1994 International Conference on Population and Development in Cairo was a milestone in the history of population and development, as well as in the history of women's rights. During the conference, 179 countries agreed that population and development are inextricably linked, and that population is not only about numbers but also about people. Implicit in this rights-based approach is the idea that every person counts. The conference also made it clear that empowerment of women is not simply an end in itself, but also a step towards eradicating poverty and stabilizing population growth. Reproductive health and rights are cornerstones of women's empowerment.

Labor force; persons of 15 years old and over who, in the previous week, were working, temporarily absent from work but had a job, or defined as being unemployed.

Labor force participation rate; the proportion of the population aged 15 and older that is economically active: all people who supply labor for the production of goods and services during a specific period

Life Expectancy at Birth; Life expectancy at birth is average number of years that a member of a 'cohort' would be expected to live if the cohort were subject to the mortality conditions, expressed by a particular set of 'age-specific mortality rates'.

Malnutrition; is a broad term commonly used as an alternative to undernutrition but technically it also refers to overnutrition. People are malnourished if their diet does not provide adequate calories and protein for growth and maintenance or they are unable to fully utilize the food they eat due to illness (undernutrition). They are also malnourished if they consume too many calories (overnutrition).

Mobility; the geographic movement of people.

National Transfer Accounts (NTAs); measure, at the aggregate level, reallocations of economic resources across persons of different ages, including those undertaken by private individuals or households and through the public sector.

Neonatal mortality; is the number of neonates dying before reaching 28 days of age, per 1,000 live births in a given year.

Out-migration; Every move is an out migration with respect to the area of origin. An out-migrant is thus a person who departs from a migration-defining area by crossing its boundary to a point outside it, but within the same country.

Population census; is a periodic enumeration of the population. The data obtained contain not only the total population but also facts on sex, age, language, and other important characteristics.

Population dynamics; Looking at "population dynamics" means going beyond mere numbers to examining trends and changes in population growth, demographic structures and societal changes, including migration, urbanization, population density and age structures (being proportions of young and older people in societies).

Population Growth; refers to the annual rate of population growth, expressed as a percentage of the base population

Population Projection; computation of future changes in population numbers, given certain assumptions about future trends in the rates of fertility, mortality and migration.

Sex ratio; is the ratio of the number of males to the number of females in a given area and time, usually expressed as the number of males for every 100 females.

Sustainable Development Goals (SDGs); One of the main outcomes of the Rio+20 Conference was the agreement by member States to launch a process to develop a set of Sustainable Development Goals (SDGs), which will build upon the Millennium Development Goals and converge with the post 2015 development agenda

Tertiary education; refers to the education associated with the attainment of post-secondary schooling qualifications, including Diplomas I to III, Diploma IV (Bachelor/undergraduate degree), and post-graduate qualifications (Masters and PhdD)

Total Fertility Rate (TFR); the average number of children that would be born alive to a woman (or group of women) during her lifetime if she were to pass through her childbearing years conforming to the age-specific fertility rates of a given year. This rate is sometimes stated as the number of children women are having today.

Under- 5 mortality rate; probability of dying between birth and exactly five years of age expressed per 1,000 live births.

Unemployment; includes persons who are: without work but looking for work; without work but who have established a new business/firm; without work but who are not looking for work because they do not expect to find work; and those who are without work but have made arrangements to start work on a date subsequent to the reference period (future starts).

Unemployment rate; unemployed persons as a percentage of the labor force.

Unmet need; Unmet need for family planning is defined as the percentage of women who do not want to become pregnant but are not using contraception. Though the concept seems straightforward, the calculation is extraordinarily complex and has changed over time.

Urbanization; the process whereby the proportion of people in a population who live in urban places increases.

1

Introduction and Framework of Analysis

With an estimated population of 255.46 million in 2015, Indonesia is the fourth most populous country in the world. Indonesia has also emerged as one of Asia's most confident middle-income anddynamic democracies. Alongside this achievement other positive trends are taking place such as increases in education, improvements in health, and reduction of poverty. This progress has significantly changed Indonesia's population dynamics and has the potential to hasten Indonesia's path to sustainable development. Indonesia can take advantage of the favourable population trends: the demographic bonus and urbanization to achieve sustainable development, however a constructive policy environment is needed to support this important transition. Faced with a limited window of opportunity, policymakers should take advantage of this momentum to establish the appropriate policy environment that will shape Indonesia's future toward sustainable development.

Despite its numerous achievements, Indonesia's development is still far from sustainable. Rapid economic development has been accompanied by rising inequality (e.g., urban-rural, West-East, between and within provinces and districts) and environmental degradation, such as high deforestation rates causing high levels of greenhouse gas emissions. Later in the book, we argue that population dynamics play a key role in shaping Indonesia's sustainable future. Futhermore, population dynamics will have a profound impact on Indonesia's sustainable development by emphasizing a balanced integration of economic, social, and environmental dimensions.

Population dynamics tell a deeper story than simply showing changes in population numbers. Population size, age-sex structure and spatial distribution of any country depend on changes in three demographic components: fertility, mortality and migration.Meanwhile, the World Summit of Sustainable Development held in Johannesburg in 2002 defines sustainable developmentas, "development that calls for improving the quality of life for all of the world's people without increasing the use of our natural resources beyond the earth's carrying capacity." This summit also suggests our current policies and decisions should take into account the integration of three key areas: economic growth and equity, conserving natural resources and the environment, and social development in considering their impact on the future (Common and Stagl 2005).

1.1 OBJECTIVE OF THE STUDY

People are both producers and consumers in sustainable development. Understanding the relationship between population dynamics and sustainable development is key to formulating sound population and development policies to achieve Indonesia's sustainable development goals. Population number, composition, and behaviour affect the direction toward, or away from, sustainable development. Furthermore, appropriate policies for sustainable development cannot be attained without understanding how population numbers and composition are changing. Therefore, this book seeks to examine the linkage between population dynamics and sustainable development in Indonesia toward an integration of population dynamics into the sustainable development framework.

Historically, population dynamics and sustainable development have been discussed separately. As a result, there is limited literature on the topic. Despite this limitation, we explore this relationship using available information and data from Indonesia, as well as our hopes for the future Indonesia wants. In particular, data on population projections, distribution, and composition provide valuable information for planning and anticipating the future in sustainable ways. Chapter 2 will elaborate on these concepts by introducing three mega demographic trends Indonesia faces.

In Chapter 3, we discuss each of Indonesia's sustainable development goals and attempt to link them with population dynamics based on projected changes in population size,

location, and age structure. This set of sustainable development goals is forward-looking and categorized into three dimensions: economic, social and environmental dimensions.

In Chapter 4, we examine a particular link between the favorable demographic trends of a demographic bonus and urbanization with sustainable development. We elaborate on the role of education in improving productivity of working age populations, which in turn promotes sustainable, inclusive and productivity-led growth.

Finally, the study concludes with suggestions on how Indonesia can achieve the Future We Want through sound population and sustainable development policies.

1.2 POPULATION ISSUES AND MODELS

1.2.1 Human Rights Based Approach

The human rights based approach entered global discourse after the United Nations passed the Universal Declaration of Human Rights in 1948. This approach was built upon during the 1994 International Conference on Population and Development (ICPD) in Cairo whereby it was declared that all persons have the right to development ,which was considered an expansion of human opportunity and freedom. As illustrated in this section, the role of population dynamics in reaching Sustainable Development Goals (SDGs) is also a matter of human rights. Despite the difficult task of fulfilling human rights, we should aim to minimize avoidable injustice that results from a failure to fulfill human rights.

Fertility and Family Planning

In the context of fertility and family planning, the human rights based approach supports the right to choose decisions at various life stages. In some cases that may be the decision to get married or not. If deciding to get married, an individual has the right to decide at what age to get married and to whom. They should also be free to make career choices and determine the kind of family to build. If children are desired, they should be free to use the preferred form of contraceptive to ensure the number and spacing between children. Once having children it is both the parental right and obligation to meet the basic needs of the children, particularly in the areas of education and health to build human capital in the future. Finally, an individual should also have the freedom to decide their future and how to live their older years.

However, costs and benefits are associated with the decisions made. Each decision poses tradeoffs among the many possible alternatives, thus illustrating the limitations to fully realizing human rights. For example, when deciding to marry early, a person should be aware of the impact on their career and family type. If an indivual desires many children, they must know how to finance their children to keep them healthy and educated. A human rights approach calls for people to be well informed about the costs and benefits of decisions, including the constraints faced in realizing one's rights.

Therefore, the government and community have a role to play in informing people about the risks and benefits to exercising one's rights. There is also a need to teach skills in rational decision-making to assist in the process. Together, the government and community should actively disseminate information on the costs and benefits

of early and late marriage, of having small and large numbers of children, of what kind of contraceptive to use, and how to invest in the human capital of children. In particular, providing affordable, safe, and effective contraception is a major step toward fulfilling human rights by empowering women and achieving ideal family sizes.

In Indonesia, fertility has been relatively low and the demand for contraceptive use has been relatively high. Without adequate supply of contraceptive, this great demand for contraceptive results in what is commonly known as the "unmet" need of contraceptive[1], when people who want to use contraceptivecannot find what they want. This "unmet need" for contraceptive results from an excess demand. Therefore, meeting the demand for "unmet needs" is an urgent and rising issue.

Family planning programstoday must aim to fulfill human rights of people. Forcing people to practice family planning and/or prohibiting people from using contraception is a violation those human rights. The objective of a family planning programmust be to fulfill the rights of people to use contraception as one of the means to build a happy family.

Mortality and Health

To live longer and healthier is a basic human right and therefore people should be well informed about how to live longer and healthier. The government and community should create the conditions where affordable, healthy and nutritious food is available and accessible and encourage businesses to supply this food. Other unhealthy habits, such as smoking, can also be tackled through awareness raising. While it is the right of an individual to smoke, a person should know all the associated costs and benefits of smoking. Therefore, the government should strongly disseminate information on the costs of smoking and provide disincentives to cigarette businesses. Raising human welfare requires a strong commitment from individuals and thegovernment to live longer and healthier lives.

Another important measure of the overall health of a population is in women's health. Meeting women's reproductive rights, particularly in developing countries, is challengingdue to inequality in the society. Women, often with lower educational levels than men and a lack of access to income and resources,arehampered when deciding whether or not to accept family planning. As a result, when women have unmet needs for contraception, there is a higher risk for unintended or unwanted pregnancy which may lead to unsafe abortion anda risk of maternal mortality. In addition, women with unintended or unwanted pregnancies will less likely pay attention to their own health or that of their fetus. They are also less likely to seek antenatal care,to obtain iron and vitamin A supplements,or to detect a high risk pregnancy from high blood pressure, heart disease, or malaria – all diseases that lead to high morbidity among pregnant women. Studies show that proper nutrition during the first one thousand days of life improves the cognitive ability of a child (Achadi 2014), thus highlighting the importance of maternal health to healthy child development.If women have the power to exercise their reproductive rights, they will deliver healthier and smarter babies for the next generation of Indonesians.

People Mobility

Ability and freedom to move is another basic human right. This right is especially critical in times of globalization where goods and capital move freely around the

1 For a more detailed explanation onwhat constitutes unmet needs refer to The Indonesian Demographic and Health Survey (2012 p. 94).

world. However, freedom of people mobility, particularly international mobility, is often seen as raising political and social tensions in receiving countries. Similarly, international free trade and free capital movement have also produced political and social unrest in some countries receiving foreign goods and capital. In response, some countries become protective of their labor, industries and investment as free trade agreements are implemented.

However, the demand for free people mobility will continue to increase with the rising demand for democratization in the world and a trend of globalization. Thus, the global community, particularly the champions of democracy, must acknowledge and protect this right.

Gender-Sensitive Approach

A gender-sensitive approach, with women's rights at its core,is key to accelerating the post-2015 development agenda on sustainable development. Gender equality must remain central to the post-2015 framework.Moving forward, the new framework should take a holistic view of gender inequalities to include: girls' completion of a quality education, womens' economic empowerment, universal access to sexual and reproductive health and rights, ending violence against women and girls, women's voice and influence, womens' participation in peace and security, and womens' contributions to environmental sustainability. Ending early marriage is another measure to reduce gender inequality. Gender equality should be mainstreamed across all sustainable development goals and one mechanism to achieve this is through applying a gender-sensitive approach.

1.2.2 Population Changes and Development

In the last decade, there is a growing interest in developing countries to study the impact of demographic changes (e.g., fertility and mortality decline) on economic, social and environmental factors such as economic growth, poverty, inequality, natural resource useand agriculture.Long term and reliable data hasnow made it possible to empirically analyze theserelationships.

One such study shows that rapid population growth had a negative impact on economic growth in developing countries between 1960-95 (Kelley and Schmidt 2001). A second study found a negative correlation between human capital and fertility suggesting better educated women leads to a decrease in fertility rates (Alders and Broer 2004). Furthermore, declining fertility rates resulted in populations with a large working age population and fewer children (Weil 2006).

Recent research shows that age structural transitions (AST), (i.e., long term shifts from youth to an older population) have major implications for economic policy and development (Pool 2007). Kelley and Schmidt (2001) found that higher numbers of working age population are positively associated with economic growth, while a larger number of young persons (age 0-15 years old) are negatively associated with economic growth. However, higher numbers of the older age population tend to be associated with lower productivity level and savings, but higher government spending (Bloom et al. 2010). Bloom, Canning, and Sevilla (2003) emphasize the importance of age structural transitions in illustrating the link between demographic change and economic growth.

In general, a larger number of working age population contributes to higher economic growth due to increases in savings, leading to higher investments, and

thus higher output per person. Lee, Mason and Miller (2001) found that in Taiwan as the working age population increased, savings rates and wealth increased substantially during the period of demographic transition. In East Asia, it was estimated an increase in savings was associated with around two percent annual per capita growth (Williamson 2001). This period provided a demographic dividend (or bonus) stemming from accelerated economic growth as a result of the decline in mortality and fertility and subsequent changes in AST (Gribble 2012).

Demographic changes are also linked to poverty and inequality.High degrees of income inequality in developing countries with relatively high levels of industrialization is often attributed to rapid population growth (Banya 1995). High fertilty leads to an increase in poverty by impeding economic growth and widening the consumption gap (Eastwood and Lipton 2001). The aforementioned study also demonstrates howpoverty was reduced by declining fertility levels in a poorer country with higher initial levels of fertility. In Brazil, Paes de Baros et al. (2001) found that lower fertility rates were also associated with lower poverty.

Many studies have also looked at the effects of demographic change on natural resource use and sustainability. Based on the Kaya identity, Hayes (2011) argues that an increase in population growth, population aging and urbanization contribute to an increase in carbon emissions. He suggests the revitalization of family planning in Indonesia will benefit not only health and social development but also lead to a reduction of carbon emissions from the burning of fossil fuels. Using an example from Honduras, Pender (2001) suggests that rapid population increasesoften lead to an increase in technological output, but also create negative environmental effects particularly in countries without adequate policies and institutional frameworks for sustainable natural resource management. Policy and practices play an important role in mediating the potential negative effect of population growth on output and land productivity. Collective action, or the capacity of societies to develop the necessary policies, is essential to reduce the negative effect of population density on agricultural output, land productivity and human welfare.

In summary, there is a growing interest to understand the relationship between population dynamics and the different areas of development, i.e economic growth, poverty and inequality, and environment. However, to date, most population studies on Indonesia are limited to only one or two of these dimensions. This study aims to contribute to the growing body of literature on population dynamics vis-a-vis all three dimensions of sustainable development in Indonesia.

1.2.3 Post-2015 Population Issues

The world is facing new and different population issues. According to May (2012) the heterogeneity of today's demographic condition is in large part due to past population policies, or lack thereof. For example, some countries and regions with high fertility rates, at a Total Fertility Rate (TFR) above 4.0, are still at the explosion stage with the population tripling or quadrupling every forty years. As a result, the population age structure is very young and out-migration is high. In countries experiencing the explosion stage, reducing fertility rates and population growth rates is critical to reducing poverty, increasing welfare, and achieving sustainable development.

On the other hand, there are also countries (e.g., South Korea, Germany, and Japan) whose fertility rates cannot sustain their own population growth, often referred to

as in the implosion stage. These countries are within the sub-replacement level with a fertility rate below 2.1. Nimwegen and Erf (2010) consider a fertility rate of 2.1 the replacement level rate for a highly developed country. Demographic characteristics of countries in the implosion stage include a population age structure that is old and a high demand for in-migration to avoid a decline in population numbers. At the implosion stage, key policy challenges become financing the increasing number and percentage of older persons; managing the rising need for in-migration and associated socio-political implications; and increasing fertility back to replacement level or higher, if possible.

There are many countries somewhere in-between the explosion and implosion stage with Indonesia as one such country. Indonesia is considered in-between because it is no longer in the explosion stage and it has not reached the the implosion stage with slightly higher fertility rate of 2.4. However, Indonesia is close to the replacement level of 2.1 suggesting that Indonesia may enter the implosion stage soon. At the provincial level, a slightly different picture emerges. To date, no provinces are in the explosion stage but some provinces, such as Yogyakarta and Bali, are currently below replacement level. Those provinces experiencing below replacement levels are already in the implosion stage and their population numbers will eventually decline if there is no in-migration to their provinces.

In Indonesia, population issues of today (2010-2030) will be very different from those characteristic of the 1960s or 1990s. There are three critical mega demographic trends that reflect Indonesia's population issues of today and into the future:

(1) Indonesia's large and growing population and high rates of urbanization;
(2) Age structural transitions with population ageing and a higher percentage of working age population with the demographic bonus;
(3) The changing pattern of population mobility toward non-permanent mobility;

These new trends will change the composition of the Indonesian population by age, sex, ethnicity, education composition and geographical distribution. These changes also hold economic implications for the composition of consumers and producers and thus reflect potential changes in the market for goods, services, and labor. Geopolitical power and environmental impact may also change as a result of the mega demographic trends. Planning for sustainable development will have to adjust accordingly to incorporate the changes brought on by the changing demographics of Indonesia's population.

Therefore, as recommended by May (2012), Given the unique structure of each country's demographic situation, population policies should not be made top-down and using only global targets. Differences between countries, and even regions, must be considered in the policy-making process. Furthermore, given Indonesia's demographic differences within the country there should not be one uniform population policy covering every province and district.

1.3 THE FUTURE INDONESIA WANTS

Regional Variation and Inequality

As the largest archipelagic country in the world, Indonesia has significant regional variation over a vast area. Indonesia's population is concentrated in the Western islands of Java and Sumatra. This denser population in the Western regions has achieved more advanced

development and created regional imbalances between Western and Eastern Indonesia. Data from 2010 verifies this finding by showing population size as significantly skewed toward the West with the largest population of 43.2 million in the province of West Java and the smallest in the province of West Papua with a population of less than one million.

Upon further examination of regional development dynamics in the last 40 years, Hill, Resosudarmo and Vidyattama (2008), concluded there have been areas of continuity and change among provinces. For example, there are provinces considered consistently wealthy, consistently non-poor, very poor and ones that are slipping behind. The provinces of Jakarta, East Kalimantan and Riau belong to the consistently wealthy. The consistently non-poor include North Sumatra, CentralKalimantan (initially driven by timber but now by cash crops), the country's two major industrial provinces of West and East Java, the major tourist region of Bali,and West Sumatra (dominated by agriculture and a range of services). Aceh also progressed in economic and social outcomes. East and West Nusa Tenggara, Maluku and Southeast Sulawesiwere consistently poor provinces. The provinces slipping behind included South Sumatra, Jambi,West and South Kalimantan, North and South Sulawesi, and resource-rich Papua, as well as Central Java and Yogyakarta.

Hill et al. (2008) also found that Jakarta, Bali and Riau stood out as the wealthiest in the regional picture because they were the most connected to the global economy.The presence of conflict also stood out as a possible explanation for low levels of economic development in certain provinces. For example, Maluku and Aceh are the victims of conflict, as well as some provinces in Papua where conflict may continue to worsen. Interestingly, they also concluded that the presence of natural resources was not a guarantee of high performance and economic development as they found performance levels of resource-richprovinces varied considerably. Moving forward, the sustainable development agenda should envisage narrowing this regional variation and inequality.

Environmental impacts have also emerged due to Indonesia's economic development. For example, Central Kalimantan by some measures has been considered a constantly non-poor province. However, it's peat lands have undergone dramatic ecological and social change over the past decades which may impact the region's development, as well as Indonesia's future sustainable development. Millions of hectares of Central Kalimantan's peatlands have been drained and converted from forest to agricultural land and palm plantations leaving them extremely vulnerable to fire in the dry years. Fire is often used by local communities to clear land for agriculture and establish ownership rights. As fires get out of control, peat combustion causes smoke and haze problems and contributes substantially to global carbon emissions. Beside the environmental damage caused, a range of economic activities are also negatively impacted by this unsustainable development pattern leaving Central Kalimatan's future development at risk.

Recommended Sustainable Development Goals

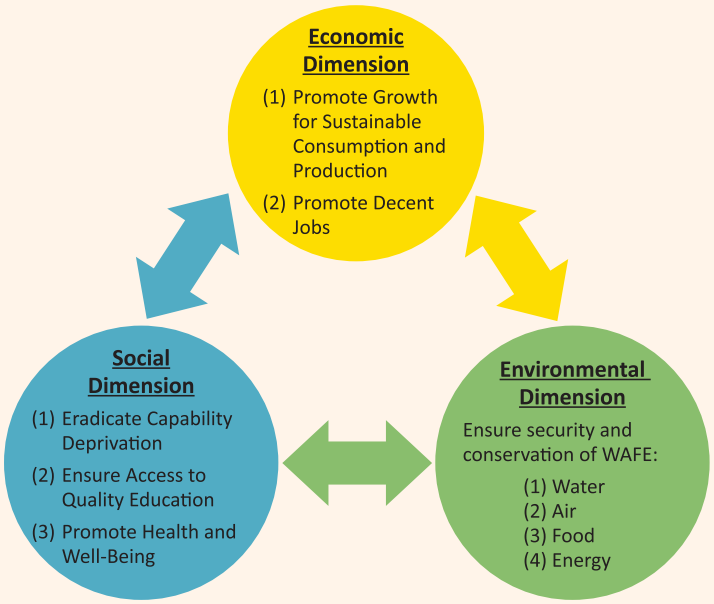
The Millennium Development Goals (MDGs) will expire in 2015 and the world is moving toward a new post-2015 development agenda. In June 2012, the Rio+20 United Nations Conference on Sustainable Development produced an important document highlighting,*The Future We Want.* This document heralds a global commitment toward a sustainable development framework incorporating a balance of economic, social and environmental dimensions.

Inspired by global commitment in *The Future We Want,* we propose Indonesia's version of the *Future We Want* consisting of the nine Sustainable Development Goals (SDGs) and their relevancy to Indonesia, as seen in Figure 1.1. The economic dimension consists of promoting growth for sustainable consumption and production and promoting decent jobs. The social dimension addressesreducing, or eliminating, capability deprivation with an

aim to focus on poverty and disability; reducing relative and absolute inequality, including gender inequality;improving education and health.Finally, the thirdenvironmental dimensionaims to ensure security of water, air, food and energy (WAFE). Throughout all dimensions, justice is critical to ensuring achievement of these goals through the enforcement of good governance and rule of law.

FIGURE 1-1

Indonesia's Sustainable Development Goals



Source: Authors' Illustration

Indonesia's conventional development model should progress to a sustainable development model oriented around human well-being. To date, Indonesia's economic development path has not paid sufficient attention to the social and environmental impacts it has created (Azis & Salim 2005). A sole focus on economic growth has led to growing inequality (i.e., income and regional), as well as environmental degradation. While economic growth is a necessary condition in achieving sustainable development goals, it is not sufficient and thus should be put in parallel with social and environmental dimensions.

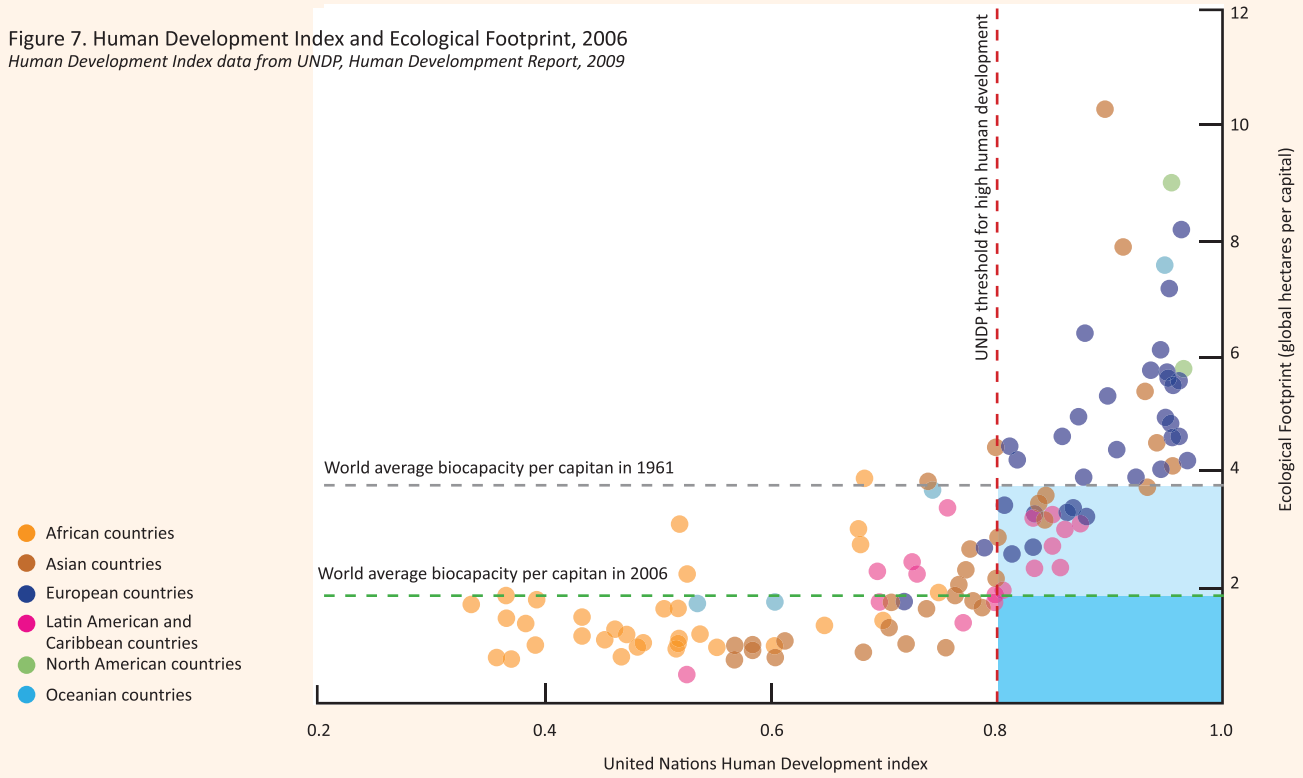
After decentralization, some regional economies have grown very fast while others have lagged behind. This disparity is partially due to different regional capacities in managing their resources, including addressing local rent-seeking behavior, which ultimately results in a widening of inequality among regions. In terms of income, economic growthtypically benefits those at the top of the income distribution, whereas income shares at the middle and the bottom tend to decline. This disparity is likely to increase the possibility of social conflict and further disrupt efforts in achieving sustainable development in the future. Meanwhile, for the purposes of raising economic growth and exports, natural resources have been exploited and unsustainable agricultural practices used (i.e., those exceeding environmental biological capacity). This growth model has put huge amounts of pressure on the environment resulting in floods during rainy season, forest fires during dry season and various types of pollution. These impacts are especially prevalent in the most densely populated island of Java and some other provinces in Sumatra, as well as North Sulawesi and West Nusa Tenggara.

Indonesia's development should aim for high human development (e.g., income, health and education) within the Earth's biological capacity, or biocapacity.[2] One useful indicator of development is The United Nations Development Program's Human Development Index (HDI). HDI is a summary measure of average achievement in key dimensions of human development: a long and healthy life, possessing knowledge, and having a decent standard of living. Another useful indicator is from The Global Footprint Network that looks at the correlation between the country's HDI and Ecological Footprint as means to measure human demand on the Earth's ecosystemsexpressed as the amount of land required to sustain natural resource use (Ewing et al. 2010). The Ecological Footprint is often compared to the country's biological capacity. For example, a country with an Ecological Footprint higher than its biocapacity will experience an Ecological Footprint deficit and thus is considered unsustainable.

As shown in Figure 1.2, many countries have high human development but their development levels exceed the Earth's limit (see Figure 1.2, upper-right quadrant) suggesting an unsustainable development path. The ideal condition (See Figure 1.2, lower right box) is when the human development index is more than 0.8 and the ecological footprint is below two global hectares per capita. According to this index, Indonesia has continuously improved in human development while remaining below the Earth's average biological capacity.

FIGURE 1-2

Human Development Index and Ecological Footprint, 2006



Source: Global Footprint Network 2010

2 Biocapacity is defined as the capacity of ecosystems to produce useful biological materials and ability to absorb waste materials generated by humans. The Global Footprint Network defines useful biological materials as those demanded by the human economy.

In 2007, Indonesia's HDI was 0.654 (just under the high human development threshold of 0.8) while its Ecological Footprint was 1.21 global hectares per person, or slightly below the world average biocapacity of 1.8 (Ministry of Public Works 2010) However, Indonesia demonstrated high regional variation in Ecological Footprint with many regions experiencing considerably high Ecological Footprint deficits, an issue explored further in Chapter 3. Moving forward, it becomes increasingly important for Indonesia to strive to achieve a high HDI within the boundaries of Indonesia's biocapacity.

1.3.1 Economic Dimension

Promote Growth for Sustainable Consumption and Production

Indonesia's economic growth has played an important role in reducing poverty and increasing the populations' standard of living. However, this economic development has taken priority over social and environmental development largely due to the misperception that green growth contradicts efforts to promote higher economic growth.

As result of improving living standards, consumption and production have increased. These unsustainable patterns of consumption and production are depleting non-renewable natural resources, thus potentially weakening Indonesia's future economic growth. Therefore, it is crucial that Indonesia promotes growth while taking into account social development that does not threaten the sustainability of the environment.

Promote Decent Jobs

Indonesia will experience a significant increase in the number of working age population by 2030.This growing number of adults will only be productive if there are enough high productivity job opportunities providing fair income, workplace security and social protection for families. Only if the labor market can absorb most of these workers in high productivity and decent jobs, will income per capital increase and economic growth be accelerated substantitally. In other words, the demographic bonus will materialize. Unfortunately, the current labor markets do not offer enough decent job opportunities, thus risking the productivity levels of productive age people. Due to a wide skill-gap, many unskilled workers work in the informal sector with low productivity, lack of benefits and poor working conditions. Consequently, promoting decent jobs is an important goal for economic and social progress.

1.3.2 Social Dimension

Eradicate Capability Deprivation

We need to reduce or eliminate capability deprivation, a concept that addresses poverty and disability. Poverty encompasses income poverty and non-income poverty, where non-income poverty includes factors that contribute to productive earning such as improving health, providing universal education, enhancing employment capability, and providing housing.

Measuring poverty must alsotake into consideration the presence of disabled persons in poor households. Neglecting to incorporate the disabled in poverty measurements can be misleading as the disabled often need more income than the able-bodied. As such, the relevance, or impact, of disability in overall development

may be under-estimated. Sen (2009) found the disabled to be the most deprived people in the world. Disability can lead to neglect, reduced freedom, and potentially less incomebecause the disabled tend to be poorer and/or because they need more money than able-bodied persons. Some may be rich, but their disabilities may bring less freedom to enjoy life. Sen (2009) further indicated that most disabled are in developing countriesand are often the poorest of the poor in terms of income. Sadly, many cases of disability are treatable and preventable. Ultimately, efforts to treat and prevent disability will work to reduce or avoid capability deprivation.

Reducing relative and absolute inequality can also help efforts toward sustainable production and consumption. Often "perceived" inequality matters more, socially and politically, than absolute inequality. In absolute terms, a person may be financially sound but may feel poor because his or her peers have achieved higher consumption levels. Globalization, alongside the accompanying trend of rising consumerism and the increased desire for expensive goods and services, can make people feel poorer despite little change in their income. This is particularly true for people living and working in poor countries on local incomes.

Ensure Access to Quality Education

Education in itself is one of the sustainable development goals. Full access to quality educationat all levels is an essential condition for achieving sustainable development. Education is an important factor for alleviating poverty, promoting health and conserving natural resources. Education is envisioned beyond formal education to be understood in a broad sense to include fighting against ignorance. Therefore, being educated is a basic human right.

To fulfill this human right, we need to ensure equal access to education for persons with disabilities, indigenous peoples, local communities, ethnic minorities and peopleliving in rural areas. Indonesia should call for enhanced cooperationamong schools, communities and authorities to promote access to quality educationat all levels. In addition, non-formal education programs should be supported as part of a lifelong learning journey to ensure sustainablity in the job market. Finally, supporting educational institutions, especially highereducational institutions in developing countries, is critical to continuing research and innovation forsustainable development.

Promote Health and Well-Being

Being healthy is both a basic human right and goal of sustainable development. Raising a population's health status[3]can only be achieved in the absenceof debilitatingcommunicable and non-communicable diseases. Indonesia should commit to strengtheningthe health systems toward the provision of equitableuniversal coverage and promotion of affordable access to prevention, treatment, care and support ofnon-communicable diseases (e.g., cancers, cardiovascular diseases, chronic respiratory diseases anddiabetes). Addressing issues of sexual and reproductive health and rights, including HIV/AIDS, are also central to increasing womens' opportunity. Ensuring a healthypopulation should also be extendedto environmental factors, such as ensuring air and water quality, that hold positive effects on health.

3 Healthy status is defined as a state when populations can reach a state ofphysical, mental and social well-being.

1.3.3 Environmental Dimension

Ensuring security in water, air, food and energy (WAFE) is a critical goal and condition to achieve sustainable development. These four issues are interconnected and should be addressed as such. For example, energy security calls for improving universal, affordable access to clean energy, which in turn, mitigates climate change and reduces the negative impacts on environment and health. Without adequate clean energy, the economy cannot develop sustainably. The rising importance of energy at the global level has made, and will continue to make, energy an important economic and political global commodity shaping the political balance among nations. Improving energy efficiency, increasing the share of renewable energy, and promoting cleaner, energy-efficient technologies is important forsustainable development.

Food security is not only concerned with adequate and affordable amounts of food to eliminate hunger, but also deals with healthy and environmentally friendly food consumption, production, and distribution. Food security includes the right of everyone to have access to safe, sufficient and nutritious food, as consistent with the right to adequate food and the fundamental right to be free from hunger. A focus on food security issues can work to revitalise agriculture and rural development. In this respect, Indonesia should take advantage of it's fertile soil and maritime biodiversity to promote and ensure food security.

Securing clean and affordable drinking water is also necessary for poverty eradication and protection of human health. We should strive for universal access to clean water and basic sanitation while ensuring efficient allocation through water resource management and maintainance of hydrological cycles. Water is also an essentialpart of food production and industry thus a necessary component to ensure food security. Water security requires keeping ecosystems intact as theyprovide an important service in maintaining water quantity and quality.

Air security, or the availability of clean air, will get increasingly difficult to achieve as Indonesia continues to develop. Current unsustainable production and consumption systems produce negative externalities, such as air pollution. Unsustainable factories and the growing numbers of fuel-inefficient vehicles will contribute to air pollution and produce more smog. Without the necessary regulation, these practices will continue to degrade air quality. Natural disasters are also likely to produce more air pollution. Indonesia is located in the Ring of Fire where the population needs protection from the possible dangerous air pollution caused by ashes from active erupting volcanoes. Recent eruptions of volcanoes such as Mount Kelud, Sinabung, and Merapi provide lessons on the importance of clean air and demonstrate the impact of natural disasters on air quality. Meanwhile, the quality of air in several parts of Sumatra and Kalimantan is at risk from forest fires year after year. These examples illustrate different sources of air pollution in different parts of Indonesia.

1.3.4 Justice

Justice is an important means to achieve Indonesia's Sustainable Development Goals and to increase the welfare of human beings. Inequality creates injustice. By focusing on reducing inequality, we can reduce injustice through the promotion of good governance, law enforcement and the eliminatation of corruption. As a major step to reducing injustice, the Central Bureau of Statistics (CBS) should attempt to

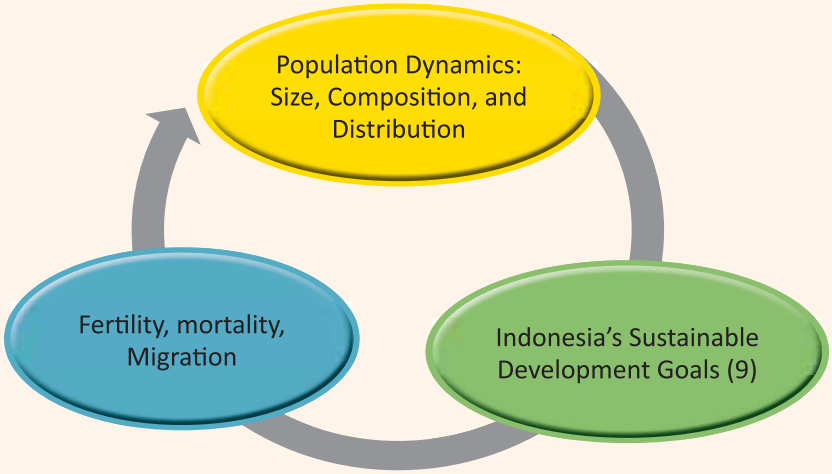
make a survey of corruption and calculate the corruption rate. A reduction of the corruption rate can then be one of the key targets of sustainable development in 2030.

1.4 FRAMEWORK OF ANALYSIS

Population dynamics has a very strong impact on the economic, social, and environmental dimensions ofsustainable development and vice versa. For example, population dynamics affect the characteristics of consumers and producers, therefore directly influencing sustainable development pathways. On the other hand, sustainable development changespopulation dynamics (e.g., fertility, mortality, and migration) leading to changes in size, age-sex composition, and spatial distribution of a population. As a result, a circular flow is created between population dynamics and sustainable development, as depicted in Figure 1.3. This flow is the basis of this study in examining the possible relationship between population dynamics and sustainable development in Indonesia.

FIGURE 1-3

Circular Analysis of the Impact of Population Dynamics on Sustainable Development



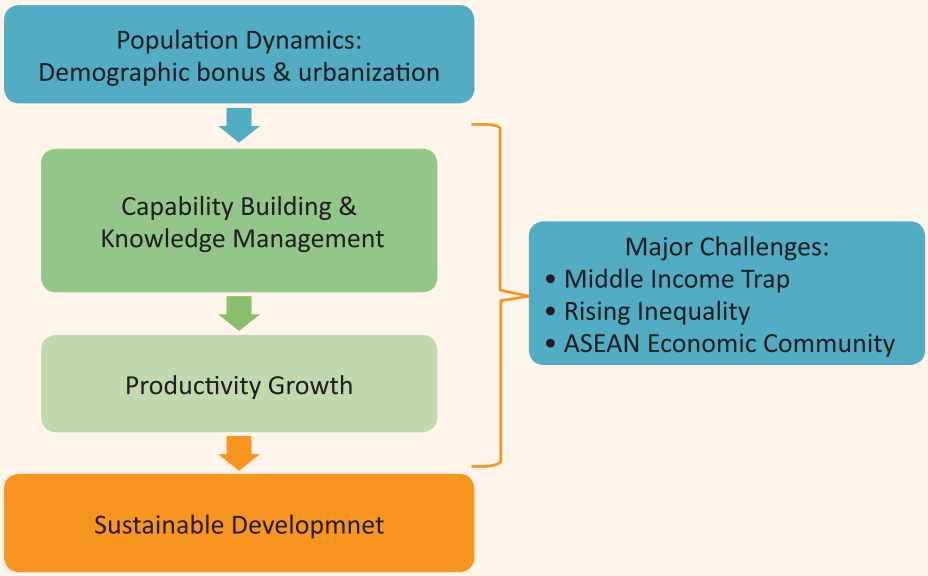
Source: Authors' Illustration

Productivity growth is a primary link between population dynamics and sustainable development as shown in Figure 1.4. Two key features of Indonesia's population dynamics are a demographic bonus and urbanization, which will be discussed in more detail later. These demographic features will havea positive or negative impact on sustainable development depending on the policy environment. Indonesia can benefit from these demographic features if, and only if, the right and appropriate policies are in place. These favorable demographic features need to be optimized to face Indonesia's major challenges of the middle-income trap, rising income inequality and ASEAN Economic Community (AEC). In particular, AEC is a challenge since there is a growing concern over competition for jobs, rising wage rates and disappearing jobs. Policies to increase capacity building, through knowledge management for example,are thus important to ensure the growing number of working age population and particularly those living in urban areas are equipped with the right knowledge and skills to raise their labor productivity and

competitiveness. In addition, the use of knowledge management in firms, government and civil society will accelerate the creation of new knowledge and innovation, thereby raisingIndonesia's total productivity. In order for knowledge management to flourish, a knowledge environment must also be created to support it. From an economic standpoint if labor productivity and total factor productivity(TFP)[4] increases significantly, there will be a rise intotal productivity growth. While this is beneficial, increases in total productivity growth should stay within the triple track (economic, social and environmental dimension) framework to ensure Indonesia's SDGs are achieved.

FIGURE 1-4

Critical Link of Population Dynamics and Sustainable Development



Source: Authors' Illustration

Population dynamics will surely play a key role in Indonesia's development. However, a significant shift is needed from the well-established GDP oriented development framework toward a more sustainable, inclusive and productivity-led path of development. A need to change the development orientation is clear. In Indonesia, maintaining the current growth patterns of the Western regions contributing 80 percent of the total population and 80 percent of the GDP will only intensify the imbalances between Western and Eastern Indonesia. The current path also perpetuates a significant development disparity between *kabupaten* (districts), within provinces, as well as between urban and rural sectors. Instead, we propose the importance of a development model that strives for inclusiveness and emphasizes raising productivity and human capital as the main driver of productivity-led sustainable development.

4 Total Factor Productivity (TFP) is defined as the efficiency in using all production inputs (e.g., labor, capital and other inputs) that contribute to output growth.

2

Future Population Dynamics: Three Mega Demographic Trends

Moving toward 2030, three main mega demographic trends will emerge. First, Indonesia's large population will continue to increase but at slowing down rate, along with rapid urbanization. Secondly, Demographic dividend has occured since the last 80's and will reach the peak by 2030, before the percentage of the working age population is eventually declining, resulting in the potential windows of opportunity. Finally, Indonesia will shift from a situation of population mobility to non-permanent mobility.

These three demographic trends will greatly influence Indonesia's ability to achieve its Sustainable Development Goals by 2030 and will be the central focus of this chapter. Section 1, focuses on the continuously larger population numbers but with growth happening at a reduced rate. This section discusses future population numbers in Indonesia at the national and provincial levels. Ultimately, rising prosperity and increased numbers creates a larger and more complex demand for goods and services and implies a rising number of the working population hold higher aspirations.

This section will also look at components of population growth primarily: fertility, mortality, and urbanization. In discussing fertility, an particular emphasis is placed on the crucial issue of unmet needs for contraceptive use, also referred to as the number and percentage of people who want space between the next birth or to limit number of children but are not using contraception.

The next section will focus on Indonesia's age structural transitions (AST). In the last few decades Indonesia has experienced a demographic transition due to a long-term decline in fertility and mortality. By 2030, age structural transitions of the Indonesian population will result in more people at productive ages and a lower dependency rate. This demographic situation, also known as the demographic bonus, opens up a window of opportunity for rapid economic growth given the support of the right policies. At the same time, Indonesia is also expected to experience an ageing population with an unprecedented growth of older persons. In general, the four broad age groups will be introduced: (1) the young population below 15 years old; (2) the youth, aged between 15 and 24; (3) the working age population, 25-59; (4) the older persons, 60 and above, and their impact on sustainable development will be explored.

The final section will look at migration and population mobility. Migration trends have become toward more short-term, frequent, and without necessarily changing the "de jure," or legal residence. This non-permanent population mobility is expected to become a rising feature of the Indonesian population toward the year 2030.

2.1 POPULATION SIZE BETWEEN 2015 AND 2030

2.1.1 The National Trend: Increasing Population ata Reduced Rate

In 2014, Indonesia celebrates its 69th anniversary since independence in 1945. Around the same time, Indonesia's population was projected to surpass the quarter-billion mark by Bappenas (Badan Perencanaan Pembangunan Nasional), BPS (Badan Pusat Statistik) and UNFPA (United Nations Population Fund). To date, Indonesia's population has been continuously rising from 119.0 million in 1971 to 237.6 million in 2010. With the deadline for the Millennium Development Goals just around the corner and the ASEAN Economic Community about to take effect; Indonesia's population will reach 255.5 million standing as the fourth most populous country in the world and the largest country in the Southeast Asia region. Moving forward, it will become an-ever larger population reaching 296.4 million in 2030. In other words, there will be 40.9 million additional surviving Indonesians between 2015 and 2030 (Table 2.1). In the global context, this additional population is larger

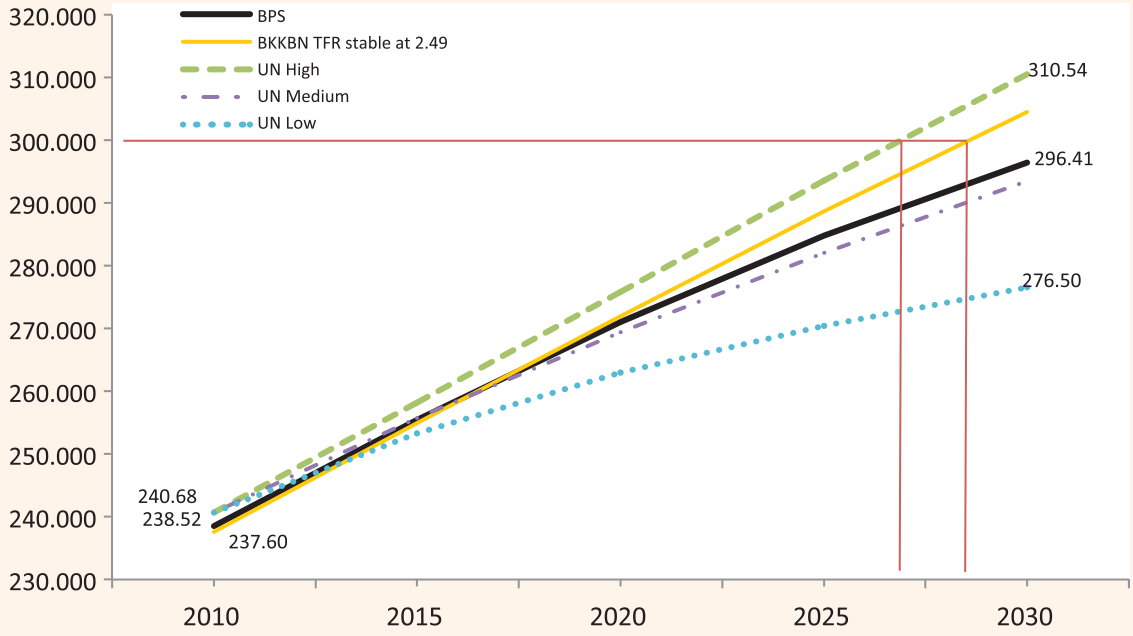
than the total population of its two neighbouring countries of Malaysia and Brunei, totalling only 31 million people in 2015.

The official population projection from 2010-2035 provides only one possible scenario (Bappenas, BPS & UNFPA 2013). To see the future growth of Indonesia's population and challenge the fertility and mortality assumptions made by the official population growth projections, we compared the scenario with the projections developed by the United Nations (2013) as seen in Figure 2.1. BKKBN also made its own population projection using a stable Total Fertility Rate (TFR)[5] at 2.49.

Results of the comparison show the official projection is close to the medium scenario made by the UN (2013) up until the year 2020. By 2030, the UN medium variant provided smaller population estimates of around 293.5 million, or 2.9 million fewer than the official projection of the Government of Indonesia. However, based on past trends and the capacity of the government to continue bringing down fertility and infant mortality rates, the government is confidentwiththe assumption that Indonesia will reach replacement level with a net reproduction rate (NRR)[6] equal to one and a TFR of 2.1 children per woman by 2025 (BPS, Bappenas & UNFPA 2013).

FIGURE 2-1

Indonesia's Population Based on Different Scenarios: 2010-2030



Source: Bappenas, BPS and UNFPA (2013), BKKBN version and United Nations (2013)

5 The UN Population Division defines TFR as, 'the number of children that would be born to a woman if she were to live to the end of her childbearing years and bear children in accordance with current age-specific fertility rates.'

6 An NRR of one means that each generation of mothers is having exactly enough daughters to replace themselves in the population

Regardless of the scenarios, the population of Indonesia will continue to increase in the foreseeable future due to the increasing number of women reaching childbearing age (age 15-49). Current estimates project approximately 75.1 million women of childbearing age, or an increase of around 10 million women from 2010. Therefore, despite the reduced fertility trend of women having only two or three children until 2030, there is still a large number of women at reproductive age as an echo effect of the high fertility in the past, thusthe total number of children will still be larger. This is called demographic momentum. This large number of children will result in an increased demand for basic needs such as energy, food, and water. The rising population numbers, coupled with the anticipated rapid economic growth in Indonesia, will multiply the demand for clean energy, healthy food, clean water, and clean air.

On the brighter side, although the population will continue to grow in the future, population growth rates are expected to decline from 1.37 percent annually between 2010- 2015 to only 0.8 percent in the period of 2025-2030 (Table 2.1). This declining population growth rate will facilitate the achievement of sustainable development through several mechanisms discussed in the following chapter.

TABLE 2-1

Total Population and Growth Rate: Indonesia, 2010 – 2030

	Year				
Scenarios	2010	2015	2020	2025	2030
	Number(in millions)				
BPS	238.52	255.46	271.07	284.83	296.41
UN High	240.68	258.14	275.83	293.57	310.54
UN Medium	240.68	255.71	269.41	282.01	293.48
UN Low	240.68	253.27	263.00	270.45	276.50
	Growth Rate(in percentage)				
BPS		1.4	1.2	1.0	0.8
UN High		1.4	1.3	1.2	1.1
Medium		1.2	1.0	0.9	0.8
Low		1.0	0.8	0.6	0.4

Source: Bappenas, BPS and UNFPA (2013) and United Nations (2013)

2.1.2 Provincial Distribution

In 1998 Indonesia transformed from the New Order regime into a democratizing country. Shortly after, in 1999, the country implemented a regional autonomy policy resulting in the creation of new provinces, districts and sub-districts.

The Province of East Timor was separated in 1999 becoming an independent country, the Republic of Timor Leste. Meanwhile, other provinces were fragmented, such as the province of Maluku was divided into two provinces, Maluku and North Maluku, after the violent religious outbreak between Muslims and Christians in August 1999. In 2000, Bangka Belitung, Banten, and Gorontalo were created. Bangka-Belitung was formerly part of South Sumatra while Banten was part of West Java.The province of Gorontalo used to belong to the province of North Sulawesi.

Between 2000 and 2010, two other provinces were created namely West Sulawesi and West Papua. In 2003, West Irian Jaya was created from Papua and was later renamed to West Papua in 2007. In 2004, West Sulawesi formed from South Sulawesi and was one of the last provinces created. Up until the latest census in 2010, no new provinces have been created and the total number remains at 33. As such, population projections were conducted for each of the 33 provinces between 2010-2030 (Table 2.2). It must be noted that in 2012 North Kalimantan which includes the city of Tarakan and four regencies (Bulungan, Malinau, Nunukan, and Tana Tidung) was created from East Kalimantan. However, the projection numbers of this new province still belong to East Kalimantan (Table 2.2). Furthermore, it is possible additional provinces will be created within the period of 2010-2030.

In 2015 projections show the largest population will be in the Province of West Java with 46.7 million people and the smallest will be in the Province of West Papua with a population of less than one million. In other words, the population distribution among provinces is highly imbalanced. This imbalanced condition is expected to remain until 2030.

Variation inpopulation sizes and cultural practices across provinces suggests a similar variation in the size of the provincial market and production base. As a result, different challenges and opportunities emerge for sustainable development. For example, depending on the intensity of inter-provincial population mobility, changes in ethnic composition should be anticipated and the possibility of ethnic conflict should be minimized. The rich diversity of ethnic composition should be treated as an asset for sustainable development.

At the turn of the twenty-first century, a multi-ethnic Indonesia accommodated a population of approximately 201.2 million with the Javanese, Sundanese, Malay, Batak and Madurese as the largest five ethnic groups (Ananta, Arifin & Bakhtiar 2008). In 2010, the rank order of the five largest ethnic groups remains the same as in 2000 (Ananta et al. 2013).

In 2015 more than half of the population (56.8 percent, or 145.1 million people) will be living on the smallest island of Java, which is the home of five largest ethnic groups: (the Javanese, Sundanese, Madurese, Betawi and Bantenese). This pattern will remain for the next 15 years and will only slightly decline to 55.2 percent, or 163.7 million people. In absolute terms the additional population living on Java island in 2030 is very significant, at around 18.6 million or equal to the total population of Sulawesi in 2015. These projections predict the island of Java will become more crowded as the land area will likely remain the same without reclamation. However, even with reclamation there is no guarantee that the inhabited areas can be expanded as it depends on the allocation of the land. Moving forward, inhabited areas will become more constrained, further emphasizing Indonesia's need for a different development paradigm to deal with the increasing population on Java.

Sumatra is the second most populated island and home to several relatively large ethnic groups such as Acehnese, Batak, Minangkabau, and Malay. The combined populations of Sumatra and Java form more than three quarters of Indonesia's total population.

The Island of Borneo is the largest island in the Indonesian archipelago. The four Indonesian provinces on Borneo are located among two other Southeast Asian countries (the states of Sabah and Sarawak of Malaysia and Brunei Darussalam). The Indonesian provinces of Borneo are home to the ethnic groups of the Dayak

TABLE 2-2

Changes in Provincial Distribution of Indonesian Population 2000-2010 and Projection toward 2030

	Province	2000	2010	2015	2020	2025	2030
11	Aceh	3,929.3	4,523.1	5,002.0	5,459.9	5,870.0	6,227.6
12	North Utara	11,642.6	13,028.7	13,937.8	14,703.5	15,311.2	15,763.7
13	West Sumatera	4,248.5	4,865.3	5,196.3	5,498.8	5,757.8	5,968.3
14	Riau	4,948.0	5,574.9	6,344.4	7,128.3	7,898.5	8,643.3
15	Jambi	2,407.2	3,107.6	3,402.1	3,677.9	3,926.6	4,142.3
16	South Sumatera	6,899.1	7,481.6	8,052.3	8,567.9	9,000.4	9,345.2
17	Bengkulu	1,564.8	1,722.1	1,874.9	2,019.8	2,150.5	2,264.3
18	Lampung	6,730.8	7,634.0	8,117.3	8,521.2	8,824.6	9,026.2
19	Bangka Belitung	900.0	1,230.2	1,372.8	1,517.6	1,657.5	1,788.9
21	Riau Archipelago		1,692.8	1,973.0	2,242.2	2,501.5	2,768.5
	Sumatera Island	43,270.3	50,860.3	55,272.9	59,337.1	62,898.6	65,938.3
31	Jakarta	8,361.0	9,640.4	10,177.9	10,645.0	11,034.0	11,310.0
32	West Java	35,724.0	43,227.1	46,709.6	49,935.7	52,785.7	55,193.8
33	Central Java	31,223.0	32,443.9	33,774.1	34,940.1	35,958.6	36,751.7
34	Yogyakarta	3,121.1	3,467.5	3,679.2	3,882.3	4,064.6	4,220.2
35	East Java	34,766.0	37,565.8	38,847.6	39,886.3	40,646.1	41,077.3
36	Banten	8,098.1	10,688.6	11,955.2	13,160.5	14,249.0	15,201.8
	Java Island	121,292.3	137,033.3	145,143.6	152,449.9	15,8738.0	163,754.8
51	Bali	3,150.0	3,907.4	4,152.8	4,380.8	4,586.0	4,765.4
52	West Nusa Tenggara	4,008.6	4,516.1	4,835.6	5,125.6	5,375.6	5,583.8
53	East Nusa Tenggara	3,823.1	4,706.2	5,120.1	5,541.4	5,9708	6,402.2
	Bali and Nusa Tenggara Islands	10,981.7	13,129.7	14,108.5	15,047.8	15,932.4	16,751.4
61	West Kalimantan	4,016.2	4,411.4	4,789.6	5,134.8	5,432.6	5,679.2
62	Central Kalimantan	1,855.6	2,220.8	2,495.0	2,769.2	3,031.0	3,273.6
63	South Kalimantan	2,984.0	3,642.6	3,989.8	4,304.0	4,578.3	4,814.2
64	East Kalimantan	2,451.9	3,576.1	4,068.6	4,561.7	5,040.7	5,497.0
	Kalimantan Island	11,307.7	13,850.9	15,343.0	16,769.7	18,082.6	19,264.0
71	North Sulawesi	2,000.9	2,277.7	2,412.1	2,528.8	2,624.3	2,696.1
72	Central Sulawesi	2,176.0	2,646.0	2,876.7	3,097.0	3,299.5	3,480.6
73	South Sulawesi	8,050.8	8,060.4	8,520.3	8,928.0	9,265.5	9,521.7
74	Southeast Sulawesi	1,820.3	2,243.6	2,499.5	2,755.6	3,003.0	3,237.7
75	Gorontalo	833.5	1,044.8	1,133.2	1,219.6	1,299.7	1,370.2
76	West Sulawesi		1,164.6	1,282.2	1,405.0	1,527.8	1,647.2
	Sulawesi Island	14,881.5	17,437.1	18,724.0	19,934.0	21,019.8	21,953.5
81	Maluku	1,163.2	1,541.9	1,686.5	1,831.9	1,972.7	2,104.2
82	North Maluku	732.2	1,043.3	1,162.3	1,278.8	1,391.0	1,499.4
	Maluku Islands	1,895.4	2,585.2	2,848.8	3,110.7	3,363.7	3,603.6
91	West Papua		765.3	871.5	981.8	1,092.2	1,200.1
94	Papua	2,213.8	2,857.0	3,149.4	3,435.4	3,701.7	3,939.4
	Papua Island	2,213.8	3,622.3	4,020.9	4,417.2	4,793.9	5,139.5

Source: Bappenas, Central Bureau of Statistics, and UNFPA (2013)

and Banjarese. The Dayak formed 1.36 percent of the total Indonesia population in 2010, while the Banjarese accounted for 1.74 percent in 2010 (Ananta et al. 2013). By 2015, all four Kalimantan provinces will host a population of 15.3 million and are set to increase to 19.3 million by 2030. By 2030, there will be 4.0 million additional people living on Kalimantan with East Kalimantan province gaining the most. (It should be noted here that East Kalimantan includes the new province of North Kalimantan before it was created in 2013.) According to Hill, Resosudarmo and Vidyatama (2008), East Kalimantan has been one of the consistently wealthy provinces over the past few decades. However, a large part of this wealth can be attributed to the mining economy. Thus, moving forward, East Kalimantan should diversify its economy beyond mining and toward a more sustainable economy.

The island of Sulawesi, although smaller in size than Borneo, is inhabited by a larger population. In 2015, the population of Sulawesi was 18.7 million and is projected to increase to almost 22.0 million by 2030. Due to its distinctive K-shape, this island is easier to access by sea than by road. In 2010 the Buginese, an ethnic group of seafarers from Sulawesi, formed 2.71 percent of the total population and ranked as one of the eight largest ethnic groups (Ananta et al. 2013).

In addition to population distribution, population dynamics examinesthe natural increase of population numbers which includes fertility and mortality trends. The following section will discuss these trends in more detail.

2.1.3 Fertility and Mortality Trends

Fertility, Contraceptive Use and Unmet Need for Contraception

Population policies in Indonesia have been closely linked to political transformations. Under the Old Order the regime believed in pro-natalist policies, favoring large population numbers, as expressed confidently in President Soekarno's statement that Indonesia can support a population of 250 million. In 2014, Indonesia's population surpassed this mark and continues to experience better social, political and economic conditions. The Old Order population policies were reversed with the implementation of strong anti-natalist programs during the New Order era seeing the large number of population as an obstacle to development. The anti-natalist policies of the New Order era delayed the population reaching the 250-million mark, improved the quality of children and the prosperity of parents. Furthermore, without the strong family planning programs in the New Order Era, Indonesia may not have become the emerging powerhouse that it is today.

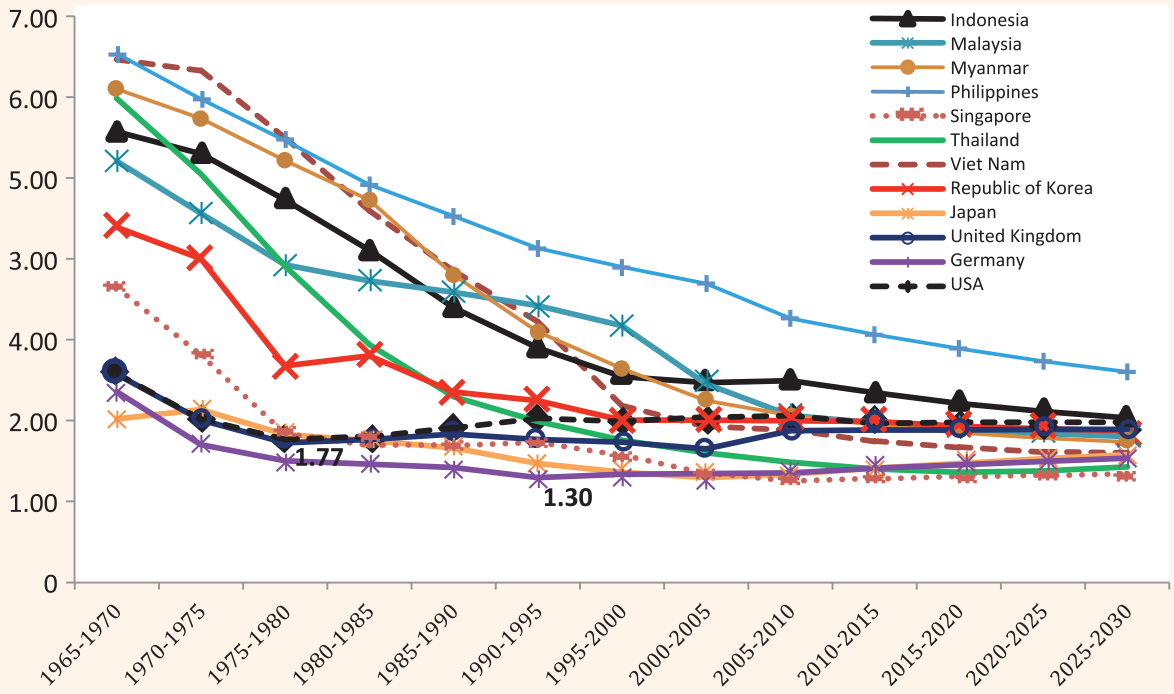
Nevertheless, it was not until the 1970s and the change of politicalregimes from the Old to the New Order that the new regimeimplemented the national family planning program full-heartedly. Among other developments, the family planning program played an important role in the fertility decline. Early on, the total fertility rate (TFR) declined quite rapidly from an average of five to six children in the late 1970s to about 4.7 children between 1976-1979. In the 1980's, the fertility rate declined further to approximately 3.3 children per woman in 1986-1989,and then further still toreach 2.3 children in 1996-1999, as estimated from a series of Population Censuses (Badan Pusat Statistik 2011*a*). By comparison, in the late 1970's, TFR in Indonesia was below that of Myanmar, Viet Nam and the Philippines and above Malaysia and Thailand (Figure 2.2). However, by the turn of the millennium, Vietnam experienced an overall fertility decline and achievement of lower fertility levels than Indonesia.

Compared to developed countries such as Germany, USA and the United Kingdom, Indonesia's fertility is relatively high. However, Indonesia's TFR will soon be similar to the USA and the United Kingdom as their rates increase close to 2.0. In 1975-1980, the USA experienced its lowest rate at 1.77, but since then its TFR has slowly risen to close to 2.0. In contrast to these selected developed countries, the TFR in Japan has been below replacement levels since 1965. Japan is experiencing a situation of depopulation with a TFR in the future will be between 1.3 and 1.4 alongside a situation of negative population growth. In the case of Singapore, Wolfgang Lutz[7] argued for the long-run optimal fertility rate to stay around 1.7 with immigration needed to avoid a decline in the resident population. In his opinion, a TFR of 2.1 is an artificial number that assumes there is no change in life expectancy and migration, when in fact, life expectancy and in-migration has increased rapidly in developed countries. Therefore, he argues for most developed countries to aim for the optimal TFR between 1.6 and 1.9.

In Indonesia, the rapid and successful decline in fertility ratesof the past can be attributed to a combination of factors and policies. First, there was a strong family planning program campaign to educate people on how to regulate and space the number of children. The campaign also served to change married couples' perceptionson the value of shifting from a large to small family size (Adioetomo, Burhan & Yunus 2009). Alongside education, the program provided cheap, safe, and effective contraceptive methods. Key to its success was strong political commitment and a centralistic bureaucracy supported by sufficient funding. Family planning was

FIGURE 2-2

TFR of Selected Countries: 1965 – 2030



Source: United Nations (2013)

7 Straits Times "Relook Population Replacement Rate, Says Expert". 14 February 2013.

also embraced by the community, including religious and community leaders. Other social and ecvonomic development policies aimed at reducing poverty, increasing education and health, improving availability of food, and raising employment opportunities, all helped to contribute to the successful reduction of Indonesia's fertility rate.

With a change in regimes in 1998, the institutional support to the family planning program weakened and as a result the 2010 population census reflects a slightly higher TFR of 2.4for the period of 2006-2009 (Badan Pusat Statistik 2011a). Interestingly, the Indonesia Demographic and Health Surveys (IDHS) conducted in 2002/3, 2007 and 2012 show a different picture with TFR estimates stable at 2.6 for about a decade (BPS Statistics Indonesia, National Population and Family Planning Board, Ministry of Health and Measure DHS 2012). As table fertility rate of 2.6 suggests that Indonesian couples internalized theTwo-Child Family Norm campaign by BKKBN and its aim to shift toward small families with slogans like, "Girl or Boy, Two is Enough."

The stable fertility rate has also postponed Indonesia's achievement of replacement fertility level[8]. Earlier projections have Indonesia reaching replacement level of fertility (measured by the TFR of 2.1, or a net reproduction rate equal to one) at the national level by the early 2000's (Ananta & Adioetomo 1990). This projection was maintained through the 2000 population census (Ananta, Arifin and Bakhtiar 2005) and was later confirmed by Hull (2010) in a study suggesting that the replacement fertility level had taken place. Overall, Indonesia's fertility rate has declined and will continue to decline slowly in the next few decades (Table 2.3); however, the latest projections show the replacement level of fertility is only expected to occur approximately between 2025 and 2030 (Bappenas, BPS & UNFPA 2013).

At the provincial level, four provinces (Jakarta, Yogyakarta, East Java and Bali) have been below replacement level for the past two decades. Central Java has also recently reached below replacement levels (Table 2.3). Central Java, East Java and Yogyakarta are the home province to the Javanese, the largest ethnic group in Indonesia. Meanwhile, Bali is the home province of the Balinese Hindus and their continued low fertility may affect the ethnic composition of Indonesia in the future. At the provincial level, we can see that shifts in fertility rate to the replacement level may hold implications for Indonesia's ethnic diversity.

By 2025-2030 there will be eight provinces with a net reproduction rate (NRR) below one: six in Java, one in Sumatra and one in Sulawesi. In addition, their TFR will range between 2.005 (North Sulawesi) and 1.694 (Yogyakarta). In the future, all of these provinces will resemble the population characteristics of developed countries. However, provincial variation will continue to exist as many provinces will remain at the replacement level, while others stay above replacement level (Figure 2.3).

It should be emphasized here that the concept of replacement level of fertility is ethically neutral. It does not suggest good or bad or whether it should be achieved or not. Simply the replacement level of fertility is the absolute population number needed to stabilize (not increase or decrease) a country's population levels assuming current fertility and mortality rates are maintained for a long time (forty or fifty years). Is a stable population number bad or good? What about a declining population number? The answer depends on many factors. In other words,

8 Replacement fertility levels are defined as the average number of children a woman would need to have to reproduce herself by bearing a daughter who survives to childbearing age (UN World Population Policies 2006).

TABLE 2-3

Projected TFR by Province: Indonesia 2010-2030

	Province	2010-15	2015-20	2020-25	2025-30
	Reference year	2012	2017	2022	2027
	NRR < 1 in 2025-30				
1	Jakarta	1,876	1,818	1,760	1,694
2	Yogyakarta	1,897	1,851	1,792	1,727
3	East Java	2,012	1,946	1,879	1,805
4	Bali	2,076	2,010	1,933	1,851
5	Central Java	2,262	2,140	2,022	1,908
6	Banten	2,469	2,288	2,128	1,982
7	Jambi	2,411	2,256	2,123	1,996
8	North Sulawesi	2,389	2,249	2,124	2,005
	NRR = 1 in 2025-30				
9	Riau Archipelago	2,312	2,213	2,128	2,043
10	West Java	2,418	2,286	2,162	2,044
11	Lampung	2,603	2,416	2,234	2,061
12	Bengkulu	2,398	2,299	2,203	2,108
13	Bangka Belitung	2,429	2,336	2,236	2,132
14	South Sumatera	2,527	2,408	2,282	2,153
15	South Kalimantan	2,670	2,494	2,326	2,158
16	South Sulawesi	2,540	2,414	2,289	2,162
17	East Kalimantan	2,635	2,488	2,349	2,208
18	Gorontalo	2,488	2,413	2,324	2,217
19	West Kalimantan	2,662	2,501	2,355	2,219
20	Central Kalimantan	2,580	2,466	2,350	2,226
21	West Nusa Tenggara	2,653	2,512	2,390	2,266
	NRR > 1 in 2025-30				
22	Aceh	2,787	2,624	2,465	2,319
23	Papua	2,663	2,556	2,461	2,359
24	West Sumatera	2,943	2,761	2,576	2,396
25	North Sumatera	3,008	2,791	2,591	2,405
26	Central Sulawesi	2,780	2,655	2,542	2,421
27	Riau	2,863	2,726	2,596	2,468
28	West Papua	2,903	2,794	2,686	2,568
29	Southeast Sulawesi	3,141	2,993	2,829	2,647
30	North Maluku	3,138	3,006	2,862	2,709
31	West Sulawesi	3,025	2,964	2,873	2,756
32	Maluku	3,337	3,205	3,064	2,908
33	East Nusa Tenggara	3,614	3,497	3,363	3,213
	Indonesia	**2,442**	**2,326**	**2,212**	**2,096**

Source: Bappenas, Central Bureau of Statistics, and UNFPA (2013)

achieving replacement level fertility does not have to be automatically good, and as such, it does not have to be made the sole target of population and development policies.

In the last decade Indonesia's TFR has stagnantedresulting in an increased population growth rate from 1.34 (2000-2005) to 1.49 (2005-2010). The critical components of TFR include contraceptive use (CPR) and the unmet need for family planning. During the last decade, contraceptive use stagnanted at 57 percent of married couples while the unmet need for contraceptive remained high at 11 percent. A high percentage of unmet needs for contraceptive shows that demand for contraceptive use is high, but the necessary services are lacking or the quality of care needs to be improved. Strong efforts to reduce the unmet need must be made through expanding access to family planning services, improving quality of services, and promoting the benefits of a small family size. These combined efforts will help reduce the fertility rate, which in turn helps reduce the poverty rate of the population. Figure 2.4 illustrates further the relationship between fertility and poverty rates. This figure shows that 26.1 percent of the variation in poverty rates in 2010 is explained by the variation in the total fertility rate in 2012. This indicates how the fertility rate is positively associated with the poverty rate, which means that a reduction in the fertility rate is accompanied by a reduction in the poverty rate.

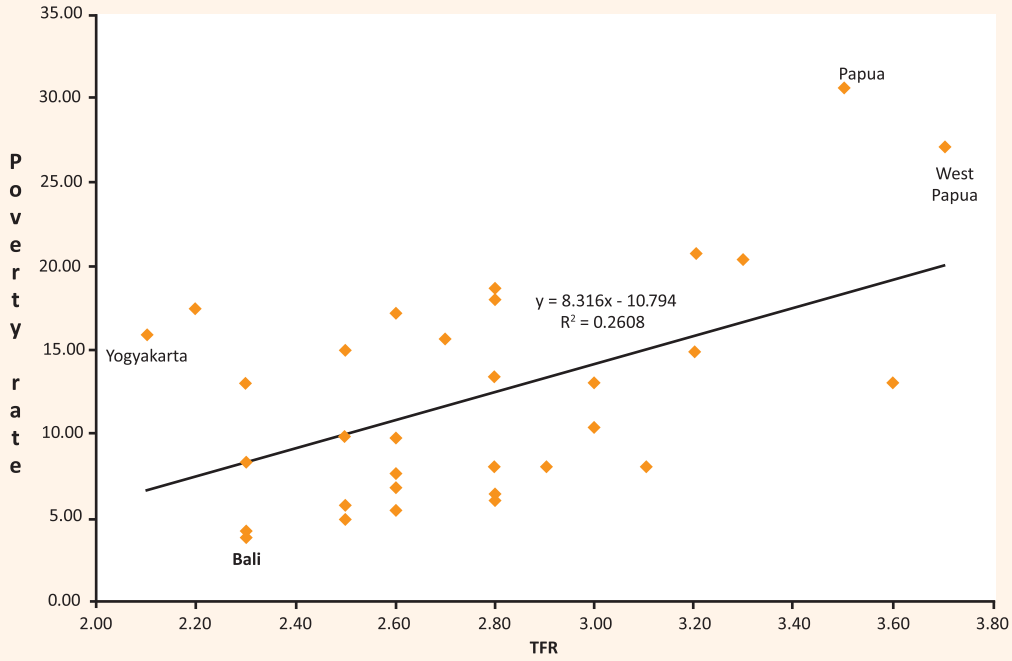
FIGURE 2-3

Projected NRR by Province: Indonesia, 2025-2030

Source: Drawn from Table 2.3 by Narwawi Pramudhiarta.

FIGURE 2-4

Scatter Plot of TFR and Poverty Rate: Indonesia, 2012



Source: Authors' Calculation

Mortality and Life Expectancy at Birth

In the context of sustainable development, mortality plays an important role in how to nurture the life of new-born babies at birth and throughout their life cycle. The under-5 age group (infants and 1-4 years old) represent a crucial period in development when the probability of dying is relatively high. The underlying high probability of death among the young population can be related to environmental conditions such as air pollution, unsafe water, and lack of nutrition.

To fully comprehend a country's population dynamics, in addition to understanding the critical under-5 age group we should also have information on mortality rates for older age groups. Unfortunately, mortality information in Indonesia is limited to the under-5 year old population and this data is used to calculate expectancy of life at birth.

From 2010-2015 the infant mortality rate (IMR) in Indonesia is relatively low with 28 deaths per 1000 live births. In the next 15 years, the IMR is projected to continue to slowly decline from 25 per 1000 live births in 2015-2020 to 22 per 1000 live births in 2025-2030. Indonesia's future IMR is projected to reach what its neighbour, Malaysia, achieved in the 1980's and according to the United Nations medium variant projection Malaysia's IMR will be one-tenth that of Indonesia (2.5 versus 22 per 1000 live births)(United Nations 2013). Policies are needed to speed up Indonesia's reduction in mortality, particularly infant mortality, in order to achieve a low mortality rate.

Advances in social and economic development during the last four decades have shifted the transition of epidemiology from soft rock to hard rock. Soft rock is indicated by the infant mortality rate (IMR) above 100 per 1000 live births, while hard rock is when IMR is below 30. There is also a stage in-between 30 and 100 called intermediate rock. Indonesia's IMRdeclined from 145 per 1000 live births in 1967 to 109 per 1000 live births in 1976 and continued to decline to 71 per 1,000 in 1986 thus reaching intermediate rock. The latest 2010 population census showed Indonesia in the hard rock with an estimated IMR at 26 per 1,000 live births (Budan Pusat Statistik 2011a). This declining trend is consistent with the findings from the Indonesia Demographic and Health Surveys (IDHS). The 1991 IDHS reported 68 out of 1,000 babies died before their first birthday and that number declined to 57 per 1,000 live births in 1994 and eventually down to 46 in 1997. Since 2002/3 the IMR declined very slowly (or almost stable) with 35per 1,000 live births in 2002/3, 34 in 2007 and finally, 32 per 1,000 live births in 2012.

The 2012 IMR can be furtherbroken down into two components. First, sixty percent of infant deaths in 2012 occurred during the age of 0 months resulting in a neonatal mortality rate of 19 deaths per 1,000 live births. Secondly, the remaining forty percent were child deaths occurring during age 1-11 months with a post-neonatal mortality rate of 13 deaths per 1,000 live births; and child mortality after 1 year and before reaching exact 5 years at 9 deaths per 1,000 live births. In other words, the total under-5 mortality rate in 2012 was around 41 per 1000 live births. This rate has been declining by more than half of the 1991 under-5 mortality rate of 97 per 1000 live births.The rapid decline of IMR during the last few decades reflects the government's success in reducing infectious diseases among the children. The remaining neonatal mortality is primarily attributed to endogenous factors during the development of the fetus.

However, the IMR varies widely by province with only 15 out of the 33 provinces in 2010-2015 reaching the hard rock stage with an IMR of less than 30 per 1000 live births. The lowest IMR during that period is seen in the province of Yogyakarta (13 per 1000 live births), and the highest IMR is in the province of Papua (55 per 1000 live births). By 2030, we expect some decline in IMR but not at rates as fast as in the past. Moving forward, the projected IMR will range from as low as 11 in Yogyakarta to as high as 49 in Papua. Most of the provinces will be at the stage of hard rock with only nine provinces in the stage of intermediate rock.

Socio-economic differentials in mortality are also observed with regards to urban-rural differences, educational attainment and household income.The IMR and under-5 mortality rate are both found to be higher in rural than urban areas. In 2012, rates show the urban IMR as 26, in contrast to 41 in rural areas; similarly, the urban under-5 mortality is 34 versus 52 in rural areas. As such, increasing urbanization in the future is expected to reduce mortality rates.

Educational attainment also seems to have a positive impact on reducing mortality. The highest IMR is found among mothers with no education (66 infant death per 1000 births in 2012) compared to those who finished secondary education andabove (22 infant death per 1000 births in 2012).

Income also impacts mortality. Data shows that the poorest households (lowest 20 percent of household income) reported the highest IMR (56 infant death per 1000live births in households) while the richest (the highest 20 percent) reported the lowest IMR (17 infant deaths per 1000 live births in 2012).

TABLE 2-4

IMR by Province: Indonesia, 2010-2030

Province	2010-15	2015-20	2020-25	2025-30
Reference year	2012	2017	2022	2027
IMR < 30 in 2025-30				
Yogyakarta	13	12	12	11
East Kalimantan	17	14	13	12
Jakarta	20	17	16	15
West Java	21	18	16	15
Central Java	25	22	20	18
Bali	23	21	19	18
Riau	24	22	21	20
North Sulawesi	24	22	21	20
East Java	26	23	22	21
Jambi	26	23	22	22
Lampung	28	25	23	22
Bangka Belitung	28	25	23	22
Riau Archipelago	30	26	24	23
West Kalimantan	28	25	24	23
South Sulawesi	29	26	24	23
Southeast Sulawesi	27	24	23	23
South Sumatera	31	28	26	24
Banten	30	27	26	25
Aceh	28	27	26	26
North Sumatera	34	31	28	26
West Sumatera	33	30	27	26
Bengkulu	33	30	28	27
South Kalimantan	37	33	30	28
Central Sulawesi	39	34	31	29
IMR > 30 in 2025-30				
Gorontalo	39	36	33	31
North Maluku	38	35	32	31
Central Kalimantan	36	35	33	33
East Nusa Tenggara	43	40	37	34
West Nusa Tenggara	48	42	38	36
Maluku	47	44	41	39
West Papua	48	44	41	39
Papua	49	45	42	39
West Sulawesi	55	49	44	41
Indonesia	28	25	23	22

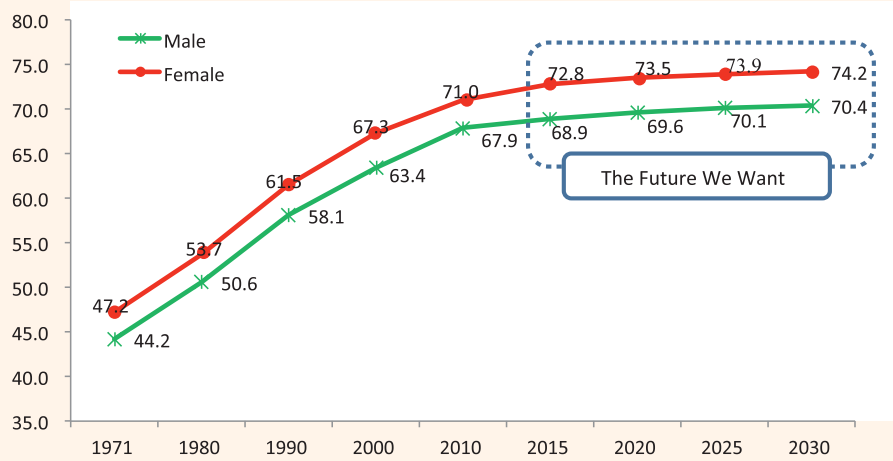
Source: Bappenas, Central Bureau of Statistics, and UNFPA (2013)

Declining mortality rates is evident in the increased expectancy of life at birth. Over the past 40 years, Indonesians have gained an average of at least 20 years in life expectancy. In 1967, expectancy of life increased from 45.7 to 52.2 in 1976, followed by a steady increase to 59.8 years in 1986, and 65.4 in 1995(Badan Pusat Statistik2011a). The latest 2010 population census data estimates that Indonesians

have surpassed 70 years of life expectancy at birth at precisely 70.7 years, with women generally living longer than men as seen in Figure 2.5. By 2030, expectancy of life at birth is projected to increase slowly to only 74.4 for women and 70.6 for men.

FIGURE 2-5

Trend in Life Expectancy at Birth by Sex: Indonesia 1971-2030



Source: Central Bureau of Statistics (2011*b*) and Bappenas, BPS and UNFPA (2013)

FIGURE 2-6

Life Expectancy at Birth by Province: Indonesia, 2025-2030

Source: Drawn by Narwawi Pramudhiarta

Regardless of the sex, life expectancy at birth will continue to be different among provinces. Yogyakarta will experience the longest expectancy of life at birth, whereas Papua expects the lowest in the period of 2025-2030. As seen in Figure 2.6, during the years 2025-2030 the two provinces of East Kalimantan and Yogyakarta expect a life expectancy above 75 years. Twelve other provinces will have a life expectancy at birth between 65 and 70 years and the majority of the provinces will be somewhere in-between these two groups. Improving mortality and health in Indonesia continues to remain a challenge even to this day.

In relation to sustainable development, mortality canbe seen as an impact rather than a cause of the poor environment where people live. Increases in mortality rates, especially among infants and children, may result from environmental factors such as pollution and climate change, poor sanitation and lack of safe drinking water.

2.1.4 Urbanization Trends

Urbanization is one of the most significant global trends in the twenty-first century. Since 2007, more than half of the world's population live in urban areas. By 2030, about 60 percent of the world's population, approximately 5 billion people, will live in urban areas. The growth rate of the urban population in developed countries is only 3.9 percent, while developing countries have experienced an explosion in urban population growth with an 8.2 percentage increase (Roland Berger 2014).

Indonesia follows this global urbanization trend and is experiencing a fast and massive transformation from a predominantly rural to urban society in the last several decades. Just after 2010, more than half of Indonesia's population live in urban areas. Urbanization is expected to continue at an even faster rate and by 2030 the urban population is projected to come to 63.4 percent. Firman (2008) describesthe urbanization trend in Indonesia as an increasefrom 22.3 percentin 1980 to 30.9 percent in 1990. By 2000, urbanization levels reached 42.0 percent and later jumped to 49.8 percent in 2010. However, Jones (2013) sets Indonesia's urbanization rates as lower than those of neighboring Southeast Asian countries of Brunei Darussalam, Malaysia and Singapore.

In 2015, there will be about 136.2 million people living in urban areas[9] and that population will mushroom to almost 188.0 million by 2030 (Bappenas, BPA & UNFPA 2013). In the past, the urban population more than doubled between 1980-2000 from 32.8 millionto 85.2 million, andfinally reaching118.8 million in 2010. Indonesia's urban population growth rate reached 5.36 percent annually during the period of 1980-1990, but experienced a decline to 4.40 percent annuallyfrom 1990-2000 (Firman 2008). This urban population growth rate is projected to continue declining to 2.3 percent annually between 2010 and 2030.

In 2010 five provinces have more than half of their population living in urban areas, including: Banten, West Java, Yogyakarta, Riau Archipelago, Bali and East Kalimantan (Table 2.5). East Java will join this group in 2015 along with Bangka Belitung and North Sumatra. In 2020, Central Java and North Sulawesi will have urbanization rates above 50 percent. In other words, by 2020 Java will become an urbanized island with all its provinces having an urbanization rate above 50 percent. By 2030, 17 out of 33 provinces will have the majority of their people living in urban areas.

9 The Indonesian population censuses of 1980, 1990, and 2000 defined an urban area when it meets three following requirements: a population density of 5000 people or more per sq km, 25% or less of the households working in the agricultural sector, and 8 or more kinds of urban facilities.

TABLE 2-5

Urbanization Rate by Province: 2010-2030

Rank in 2030	Province	2010	2015	2020	2025	2030
1	Jakarta	100.0	100.0	100.0	100.0	100.0
2	West Java	65.7	72.9	78.7	83.1	86.6
3	Riau Archipelago	82.8	83.0	83.3	83.8	84.5
4	Yogyakarta	66.4	70.5	74.6	78.0	81.3
5	Banten	67.0	67.7	69.9	73.7	78.8
6	Bali	60.2	65.5	70.2	74.3	77.8
7	East Kalimantan	63.2	66.0	68.9	71.8	74.8
8	North Sumatera	49.2	52.6	56.3	60.1	64.1
9	North Sulawesi	45.2	49.8	54.7	59.2	63.9
10	Bangka Belitung	49.2	52.5	56.0	59.7	63.5
11	East Java	47.6	51.1	54.7	58.6	62.6
12	West Sumatera	38.7	44.2	49.6	54.6	59.4
13	West Nusa Tenggara	41.7	45.4	49.4	53.6	58.1
14	Central Java	45.7	48.4	51.3	54.3	57.5
15	South Kalimantan	42.1	45.1	48.4	52.0	55.8
16	South Sulawesi	36.7	40.6	45.0	49.8	54.9
17	Gorontalo	34.0	39.0	44.0	48.9	53.5
18	Central Kalimantan	33.5	36.6	40.2	44.1	48.3
19	West Kalimantan	30.2	33.1	36.2	39.8	43.7
20	Southeast Sulawesi	27.4	31.2	35.0	39.4	43.6
21	Riau	39.2	39.6	40.1	40.7	41.2
22	Maluku	37.1	38.0	38.9	39.9	41.0
23	West Papua	29.9	32.3	34.9	37.8	40.9
24	Aceh	28.1	30.5	33.2	36.2	39.5
25	South Sumatera	35.8	36.5	37.3	38.2	39.1
26	Central Sulawesi	24.3	27.2	30.5	34.2	38.4
27	Lampung	25.7	28.3	31.3	34.6	38.3
28	Papua	26.0	28.4	31.2	34.2	37.7
29	Jambi	30.7	32.0	33.3	34.8	36.5
30	Bengkulu	31.0	31.7	32.6	33.5	34.5
31	East Nusa Tenggara	19.3	21.6	24.3	27.3	30.7
32	North Maluku	27.1	27.8	28.5	29.2	29.9
33	West Sulawesi	22.9	22.9	23.0	23.0	23.1
	Indonesia	49.8	53.3	56.7	60.0	63.4

Source: Bappenas, BPS and UNFPA (2013)

As the island of Java becomes increasingly urbanized, the differences between urban and rural areas willalso become less distinctdue toincreased linkages between the two areas. For example, spatial development is shaping an urban belt connecting all cities in Java and creating Mega Urbanization (Firman 2008). The intermediate cities on the outer islands have a relatively high population growth rate compared to cities of a similar scale on Java. This suggests intermediate towns and cities on

the outer islands are playing a more significant role as centres for socio-economic development compared to equivalent citieson Java. The new regional autonomy and fiscal decentralization policy is expected to spur further urban development in these outer islands.

Furthermore, Jones (2013) observed a lessening in the distinction between living conditions of urban and rural areas due to the dramatic development of transportation and communication in rural areas. The rural population is no longer geographically isolated, in part due to increased access to motorcycle ownership that allows for easy commuting into towns. Despite this progress, there are environmental costs such as the production of carbon dioxide emissions and noise pollution as a result of the massive increase in motorcycles.

Access and availability of information is even faster due the presence of mobile phones and satellites. In the past, rural areas were not able to connect to the global or national news, but today they are watching the same global television programs as the urban population. In addition, rural populations working overseas are now better able to stay in regular contact with their household members despite the long distance. In the future, the lifestyle of the urban and rural populations will converge even without additional infrastructure.

However, as argued by Firman (2008), urbanization in Indonesia is still characterized by a heavy concentration of urban populations in a few large cities, such as Jakarta, Surabaya, Medan and Bandung.The Jakarta Metropolitan Area (JMA) alone accounts for more than one-fifth of the Indonesian urban population. This may reflect the integration of the JMA and other large cities into the global economy, but it also suggests an inter-urban disparity between JMA and other citiesand large and smaller cities (Firman 2008). The largest agglomeration of population in Indonesia is in Jabodetabek, also known as Jakarta, Bogor, Depok, Tangerang, and Bekasi. The second largest is in Gerbangkertasusila.

Indonesia's pattern of urbanization will change considerably in the near futuregiven factors of regional autonomy and fiscal decentralization. For example, the level of urban primacy, ora central place in a city that has obtained a great level of dominance, will decline. This decline will be accompanied by high growth in the urban populations of the outer islands, especially in resource-rich regions of the outer islands, most notably in East Kalimantan, North Sumatra, North Sulawesi, South Sulawesi and Riau Archipelago. These growing provincial cities willserve to attract populations from Java who are responding to employment opportunities connected with natural resource exploitation.

The process of urbanization may pose environmental challenges. Cities are major contributors to greenhouse gas emissions and are highly dependent on fossil fuels. High urbanization can also create vulnerabilities to climate related disasters. In addition, high urbanization can accelerate the development of slum areas which suffer from poor access to water, sanitation and waste management. Food security is another concern whereby rapid land transformation from agriculture to industrial activities can jeopardize access to food and rural livelihoods.

Since 2011, cities and urban areas have been facing new challenges with over half of Indonesia's population living in these areas. In response to these challenges, we should promote and envision, "Liveable Cities," that factor in environmental and socialconditions and offer an alternative form of development. For example, urbanization and economic growth have createdan increasing demand for water, thus further exacerbating Indonesia's existing water security challenges. The 2010

Population Census shows that urban households in Indonesia consume over six times the amount of bottled water than rural households at 25.5 percent versus 4.1 percent. Therefore, one step toward a more liveable city may be to reduce the consumption of bottled water. However, in order to do so Indonesia needs to invest in public water infrastructure, such as public drinking fountains. Moving forward, Indonesiamustcontinue to take the necessary steps to secure a sustainable water supply for its growing population.

In anticipation of high urbanization rates across Indonesia, all basic services must be prepared and planned for. A larger urban population will need access to basic infrastructure such as affordable housing; health care facilities; reliable and inexpensive transportation systems based on renewable energy; reasonably priced energy sources; open space and green parks for social interaction; and waste management. These liveable cities will have a positive effect on sustainable development. A significant improvement in the well-being of city dwellers will in turn impact their decisions in family planning.

In summary, urbanization can be a major challenge for Indonesia, but it can also present an opportunity. In the past, government urban planning efforts have been inadequate in addressing environment and climate change. A clear example of such policy failure is the frequent and annual flooding in Jakarta and other major cities in Indonesia (Dick and Rimmer, 1998). Moving forward, the development of more liveable cities can help mitigate some of the challenges of urbanization and better take advantage of the benefits.

2.2 POPULATION AGE COMPOSITION: THE EMERGENCE OF A DEMOGRAPHIC BONUS AND AGEING POPULATION

As previously discussed, the second half of the twentieth century has witnessed rapid demographic transition in many Asian countries, including Indonesia. The population numbers continue to grow, but they are growing at a reduced rate. The age-structure is changing after declining fertility rates, thus creating an abundance of working-age population and moving away from an abundance of young dependent population (aged below 15). The changing age structure can have major social, economic, and environmental impacts, particularly if not anticipated.

Taking a lifecycle approach, the population can be disaggregated into different stages with specific social, economic, and environmental impacts at each stage. The broad life cycle stages can be grouped into young (age group 0-14), youth (15-24), working age (25-59), and older persons (60 and above).

Each of these stages impact the development dimensions (economic, social, political and environmental) differently. Young children (0-4) are extremely physically and financially dependent, as well as large consumers of health services in their early years. Within this age interval, the first 1000 days of life are a critical development period that will influence the child's health status in adult life. Children (aged 5-14)are also financially dependent consumerswho are dependent on adults for their health and education. This young age group are custodians of the future working age population, or productive population. Therefore, healthy and educated children are essential to producing "The Future Indonesia Wants." As such, spending on the health and education of children should be seen as an investment that will create a high quality labor force in the future.

The youth population (15-24) also consume health services, technology,as well as a costly education. However, their consumption behaviors are different from children (0-14) due to differences in their needs and services. Some youth populations are already actively involved in the labor market, especially those who cannot pursue a higher education until *sarjana* (bachelor degree).The youth population is another critical group. They are the final stage before entering the labor force making their human capital development essential. Failing to provide better, affordable and accessible education and health services for youth may create an unproductive labor force for the economy.

The working-age population (25-59) is a large group that contributes the most to the economy.They are responsible to financially support the children, youth, and elders of society. Those aged 25-29 are early in their career stage, have little savings, may struggle to become more productive workers,while at the same time may enjoy starting a family. The 30-49 population perhaps consumes less than average, needs more money for their children,may earn more than the younger cohort, and invests more in housing. The population aged 50-59, before becoming older persons, are likely to earn higher incomes because of their work experience and having reached their peak. They mayalso have a higher savings rate than the younger population aged 25-49. On the other hand, theirconsumption and financial demands may increase if they become unhealthy.

People aged 60 years old and over are officially defined as older persons, in Indonesia and most developing countries. In developed countries older persons are defined as those aged 65 and over. Whether the cut off is 60 or 65, most older persons (aged 60 and above) are fragile and depend on others for their consumption needs, such as health care and social support.

2.2.1 Dependency Ratio and the Demographic Bonus

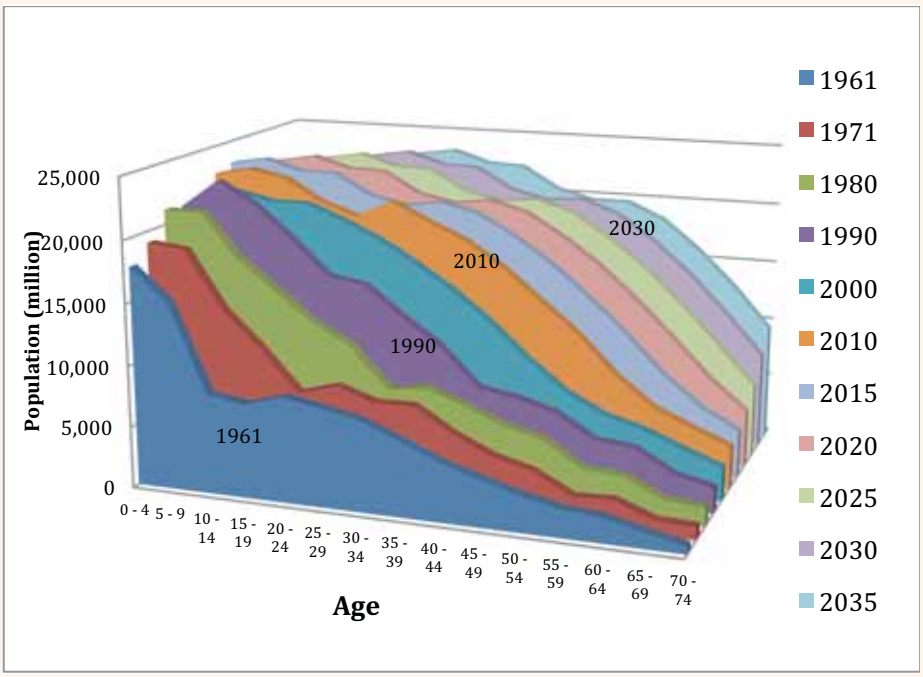
Indonesia has been experiencing, and will continue to experience, an age-structure transition due to declining fertility and mortality rates in the past and in the future. The impact of this demographic transition is visible in the declining percentage of the young population (age 0-14 years old) from 44.0 percent of the total population in 1971 at the start of Indonesia's family planning program,down to 36.6 percent in 1990, 28.9 percent in 2010, and with expectations to decline further to 22.4 percent by 2030. Despite the declining fertility, the total number of young people from 0-14 years old continued to increase as the number of mothers rose. Even though the average woman had only two or three children, the larger number of women at reproductive age resulted in a large number of babies born. Therefore, the absolute number of young people is still large, having increased from 41 million in 1961 to 60 million in 1980, and continously rising to reach 68 million in 2010.Only in 2030 will the numbers decline to 66 million[10].

The impact of declining infant mortality is one of the reasons for an increase in life expectancy. These young people will grow older to become young adults, then working age population, and later on as part of the older population (Figure 2.7 and Figure 2.8). This age structural transition in Indonesia has a serious impact on the demand for basic services, including: education, health and employment opportunities, which in turn, impacts sustainable development and potential environment degradation.

10 Due to lack of data, this national figure does not include international migration. However, experts say that the percentage of international migration will have only a minimal impact on the size of the population. At the provincial level, however, internal migration should be accommodated since it impacts the age structure and is mostly conducted by young people.

FIGURE 2-7

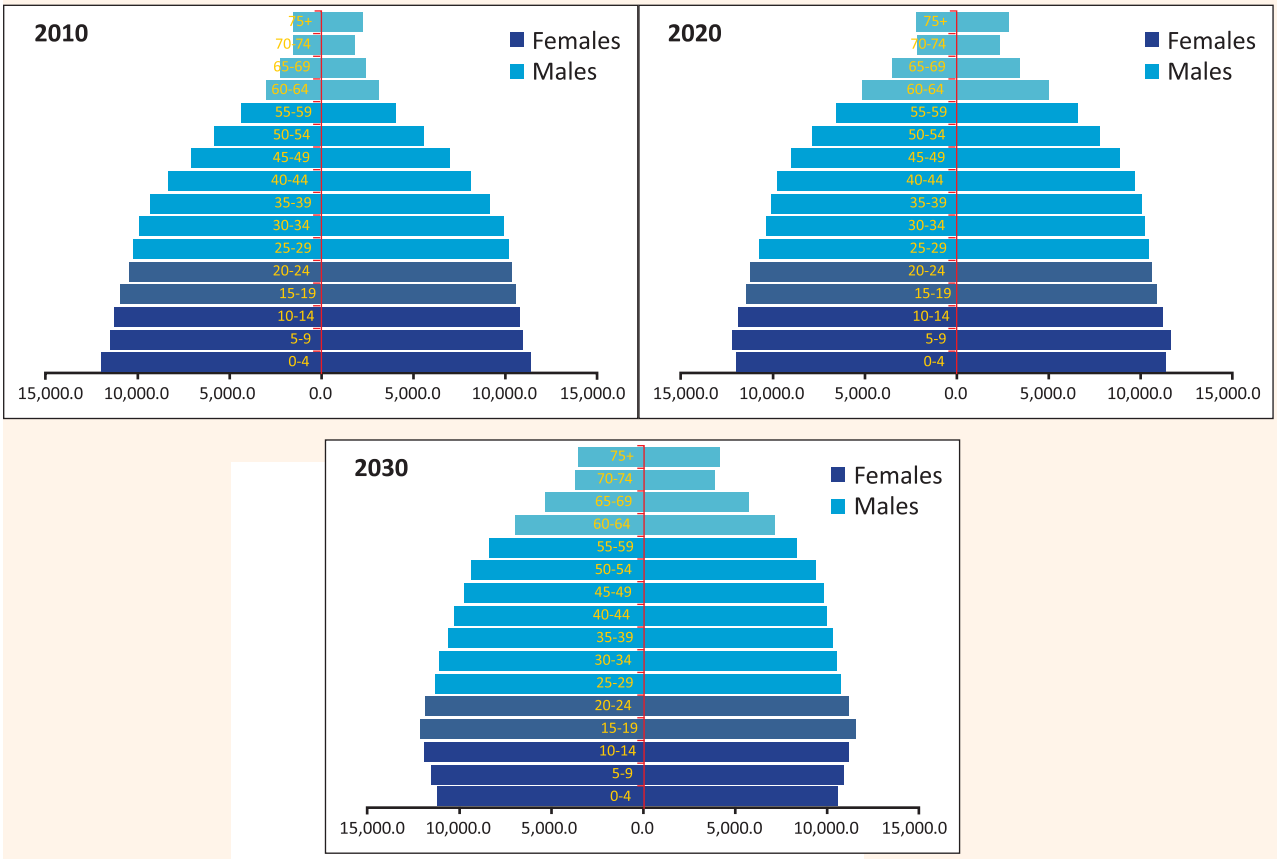
Past, Present and Future of Indonesian Age Structure, 1961-2035



Source: Adioetomo (forthcoming), Population censuses 1961-2010 and population projection 2010-2035

FIGURE 2-8

Age Structural Transition in Indonesia: 2010 – 2030



Source: Drawn from the projection conducted by Bappenas, BPS and UNFPA (2013)

The impact of changes in population age structure on potential economic growth can be presented in a summary measure known as the dependency ratio. The dependency ratio is the numberof dependentsto every hundred productive persons, thus showing how many dependents are supported by one productive person. The support ratio is the opposite of the dependency ratio displaying how many productive persons support one dependent person. The support ratio is thus defined as the number of productive persons over the number of dependents.

Typically, the dependent population consists of young dependents (aged below 15 years old) and older dependents (aged 65 years and older) who rely on the working population (aged 15 and 64 years old). Therefore, three dependency ratios exist. The young dependency ratio shows the burden from the population below 15 years old; the old dependency ratio indicates the liability from population aged 65 years old and over; and finally, the total dependency ratio is the sum of young and old dependency ratios.

The ratios highlight the potential dependency burden on the working age population. A high dependency ratio indicates the productive population, and the overall economy, face a greater burden to support and provide the social services needed by younger and older persons. A high youth dependency ratio, in particular, implies higher investments are needed in schooling and childcare.

The year 1971 illustrates that as fertility rates decline the dependency ratio initially falls because the proportion of younger persons decreases. However, the proportion of older persons increased from 1971 but this increase was still smaller than the decrease in younger persons. In other words, the young dependency ratio declined more than the increase in the old dependency ratio. As a result, the total dependency ratio has been slowly declining from 1971 to a low of about 47 dependents per 100 persons of working age (Table 2.6).

TABLE 2-6

Trend in Dependency Ratios by Dependent Age Groups: Indonesia, 1971-2035

Dependent groups	Year										
	1961	1971	1980	1990	2000	2010	2015	2020	2025	2030	2035
Dependency ratio of children<15 years	76.9	82.2	73.3	61.5	47.5	43.0	40.6	38.5	36.2	33.6	31.7
Dependency ratio of older persons65+ years	4.9	4.7	5.8	5.3	7.2	7.6	8.0	9.2	11.0	13.2	15.6
Total Dependency ratio <15 and 65+ years	81.8	86.8	79.1	67.8	54.7	51.3	48.6	47.7	47.2	46.9	47.3

Source: Adietomo and Posset (2014)

The period after the start of the decline of the young dependency ratio, and the associated economic growth, is called the "first demographic dividend" (Lee & Mason 2006). A dividend describes an economic window of opportunity measured by the resulting GDP growth. This dividend can last for decades but it is not a guarantee. A demographic dividend, or bonus, does not automatically boost economic growth. Appropriate policies must be in place to reap the benefits of this trend. From the supply side, Indonesia must seriously invest in human capital development to improve the quality of education and health services in order to produce healthy and productive workers. From the demand

side, employment opportunities have to be created with productive investment to increase job creation and ensure decent jobs for the large number of workers.

The dividend occurs because the declining young dependency ratio is supposed to provide an opportunity for a country to save more. By saving more, additional investments can be made and the economy can grow faster. As such, Lee and Mason (2006) do not simply define the first demographic dividend in terms of the dependency ratio but also in terms of GDP growth. High economic growth caused by a declining young dependency ratio is what they call the first demographic dividend.

However, given the current globalization and rising consumerism, we may question whether declining dependency ratio actually leads to higher saving. With the promotion of credit-led growth and foreign domestic investment, we may also question the reliance of investment on domestic savings. Amidst high inflation rates, savings easily erode and we may further wonder whether we have to save before we invest.

In Indonesia, a second demographic dividend is possible if the older persons can live long and are healthy, independent, and productive, and therefore contributing to GDP growth. This is similar to what Arifin and Ananta (2009) argue whereby a large number of older persons is an asset rather than a liability for the economy. Lee and Mason (2006) demonstrate how the second and first demographic dividends may overlap. Similar to the first demographic dividend, Lee and Mason's second demographic dividend relies mostly on contributions to GDP growth. According to this definition, Indonesia has been experiencing its first demographic dividend since 1970 when its young dependency ratio started to decline and the GDP continued to grow.

It should also be noted that the cut-off age in the definition of dependency ratio is debatable. The current cut-off of a young dependent population below15 years of age may be too young when accounting forIndonesia's compulsory education of 12 years. More realistically, young children will be their parents' dependents until they reach 18 years old. Furthermore, parents now aspirefor their children to receive a tertiary education requiring additional financialsupport for at least four years longer, or until 22 years of age. Therefore, the young dependent threshold may actually be closer to under 25 years old.

On the other hand, in Indonesia the threshold for being an older person is 60 years old rather than 65 years old. However, as life expectancy is getting higher and people are becoming healthierthe age of 60 may not be considered the threshold for being an old age dependent in Indonesia. As such, 65 may be the more accurate threshold of being an older person, or old age dependent. Further progress in raising the health and marketability of the skills of older persons can raise the threshold further to 70 or even 80 years old. Should the older threshold be redefined to70 years old, for example, and the young dependent as those below 25 years old, the working-age population should also be redefined as those above 25 years old and below 70 years old.

Furthermore, not all among the working or productive age population are productive because of low education and health. The poor may work long hours but their income remainsat survival levelsbecause there are no unemployment benefits. Similarly, some may suffer from various diseases that reduce their productivity and capacity to work.

In brief, the dependency ratio should be seen as a dynamic concept with changing thresholds as the quality of the population changes. Factors such as changing education and health will affect the threshold. Consequently, dependency ratios and all the concepts derived from dependency ratios, are crude measurements of the "burden" of the population on the economy.

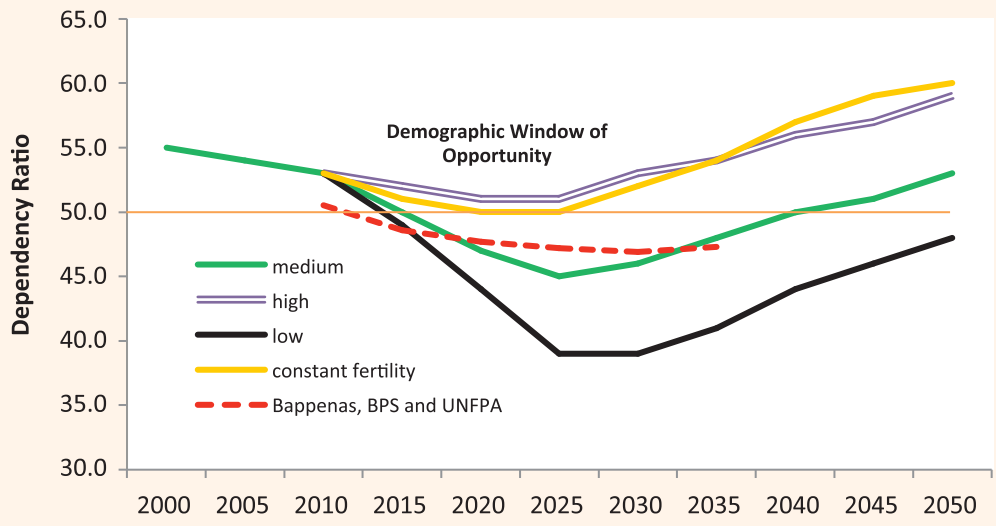
Another way to interpret the change in dependency ratio is when the total dependency ratio is low, or when it is below 50 (i.e., one dependent is supported by two or more productive persons). This low burden for the productive person is seen as a demographic window of opportunity to invest, assuming the productive person is able to save and then invest. At this time, the society can reap the economic benefits of a growing number of potential producers relative to the number of consumers (Rallu & Robertson 2010).

Based on official projections from 2010-2035 (Bappenas, BPS & UNFPA 2013)[11], and using the aforementioned definition, Indonesia's demographic window of opportunity opened in 2010 with a total dependency ratio below 50. The dependency ratio is projected to stay below 50 until 2035 and will continue for the next 10 years and may reach above 50 after 2050.

Based on the UN medium variant, Indonesia's total dependency ratio of below 50 will last from 2015 to 2040 with the lowest ratio of 45 in 2025 and a closing of the demographic window in 2040 (Figure 2.9). The UN low variant provides a dependency ratio below 50 that will span 10 years longer than the medium variant, from 2015 to 2050, with the lowest ratio of 39 between 2025 and 2030. With the UN low variant, the demographic window will close in 2050. In contrast, if we follow the UN high variant, Indonesia will never have a demographic window of opportunity as the total dependency ratio will never go below 50. Economic benefits can be achieved if the fertility rate remains at replacement level, the pace toward an old population can be slowed down, and the total dependency ratio remains well below 50.

FIGURE 2-9

Dependency Ratio based on the Projection Variant:Indonesia, 2010 - 2035



Source: Drawn from United Nations (2013) and Bappenas, BPS and UNFPA (2013).

Adioetomo (2005) made adifferent interpretation. She followed the concept of demographic bonus with the same age groupings of young dependent and old dependent populations. Similar to Lee and Mason's first demographic dividend, she defined the demographic bonus as the point in time when total dependency ratio steadily declines (Figure 2.10).

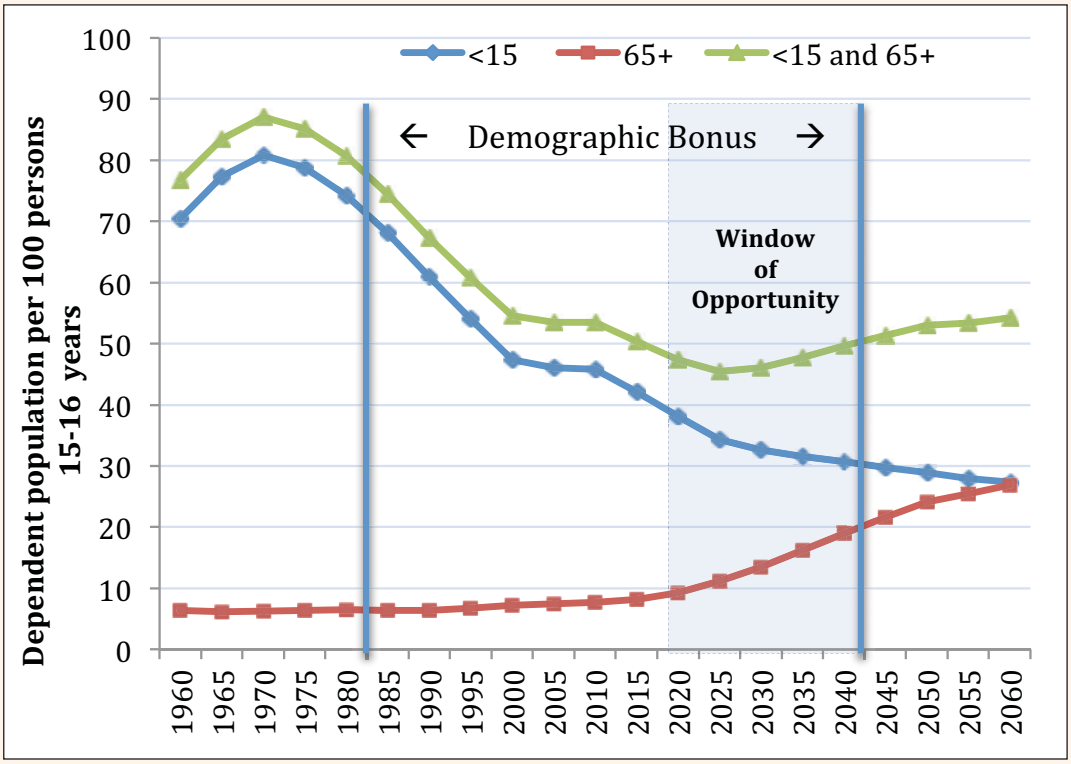
11 Bappenas, BPS and UNFPA. 2013. *Indonesia Population Projection, 2010-2035*. Jakarta: BPS

However, Adioetomo described the demographic window of opportunity as the lowest points of the demographic bonus right before the total dependency ratio starts to increase. As such, the window of opportunity is defined as, "the shallow stage of the demographic bonus and the increasing dependency ratio." The impact of the fertility decline in Indonesia was realized in the 1980s when the annual population growth decreased from 2.1 percent to 1.8 percent a year, thus marking the beginning of the demographic transition (see Figure 2.10). Based on her study, the demographic bonus will end in 2030 when the dependency ratio begins to increase. In addition, the demographic window of opportunity will be reached at the lowest points of the demographic bonus within a short period of time between 2020 and 2030 (Adioetomo 2005).

As the old dependent population begins to rise sharply this will offset the decline in the young dependent population and increases in the working-age population resulting in an increase in Indonesia's dependency ratio, largely due to the old population.

FIGURE 2-10

Bonus Demography and the Window of Opportunity (UN Population Projection, Version 2012 revision)



Source: United Nations, Department of Economics and Social Affairs, Population Division (2013). World Population Prospects: The 2012 Revision

Despite the many interpretations of the changing dependency ratio and definitions of a bonus, dividend, or window of opportunity, the main message to convey is that Indonesia has a very short time to prepare for this demographic bonus and cannot let this window of opportunity pass by. The 2020-2040 window of opportunity provided by the demographic bonus should be exploited to generate sustainable development. Investments in economic, social, and environmental aspects are vital, as are the policies to support the continuation of fertility declines to further sustain the window. Failure to act on these issues will cause rising unemployment and anexhausting of available resources

due to a large number of the older population. Furthermore, the potential bonus, if not tapped into, could turn to a demographic crisis that could jeapordizeIndonesia's chances of attaining sustainable development (Adioetomo 2005).

2.2.2 Young Persons (below 15 years old)

This age group is very important as custodians of the future labor force. Investment in the health and education of this age group will determine much of the productivity of the future labor force and even the well-being of the future older population. In other words, investment (particularly in health and education) in the first fifteen years of life is crucial to producing a productive labor force capable of achieving sustainable development. It is necessary to understand the population dynamics of young persons today as young persons aged 10 – 14 years old in 2015 will form the youngest part of the labor force in 2030.

Though Indonesia's fertility continues to decline, the reduction in the number of young persons aged 15 and below takes time. The number of young persons will continue to increase from 68.1 million in 2010 to its peak in 2020 at about 70.7 million. Numbers of young people will begin to decline in 2025 and by 2030 will come to around 67.9 million people (Table 2.7). In 2015, 9.41 percent of the population or 24.03 million people, will be under the age of 5. Overall, there will be a reduction in the population aged 0-4 from 23.47 million (8.66 percent) in 2020 to 22.07 million (7.45 percent) in 2030.

TABLE 2-7

Number and Percentage of Specific Age Groups: Indonesia, 2010-2030

Age Groups	2010	2015	2020	2025	2030
Number (in thousands)					
0-14	68,138.0	69,857.4	70,710.0	69,996.5	67,882.8
15-24	42,497.5	43,543.3	44,385.2	45,508.1	46,955.4
25-59	109,846.6	120,375.6	128,883.5	135,628.6	140,611.2
60+	18,036.7	21,685.4	27,087.7	33,695.8	40,955.7
Percentage					
0-14	28.57	27.35	26.09	24.57	22.90
15-24	17.82	17.04	16.37	15.98	15.84
25-59	46.05	47.12	47.55	47.62	47.44
60+	7.56	8.49	9.99	11.83	13.82

Source: Calculated from Bappenas, BPS and UNFPA 2013.

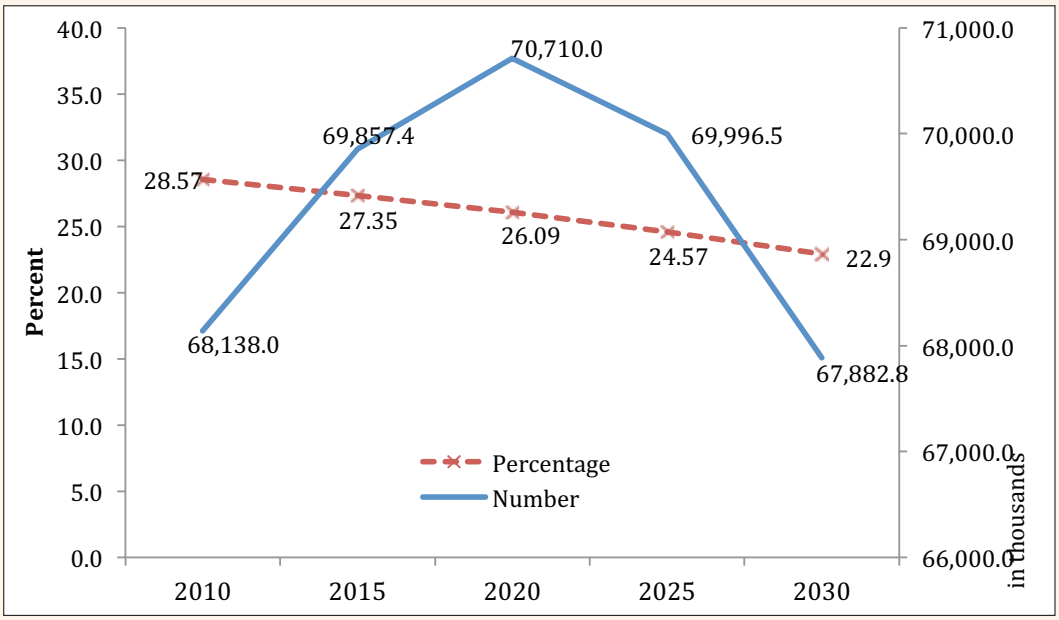
The young persons of 2030 have not yet been born. This presents opportunities and challenges to prepare and welcome the new generation to a better world. One preparation can be to guarantee potential couples at marriageable ages have better health, education, and nutrition. This can be ensured by including this knowledge in a program to promote parents' understanding of child development, such as the government's Under-five Family Education program (*Bina Keluarga Balita, BKB*) taking place in every locality and village.

In addition, we need to understand the mortality rate of the population born between 2010 and 2015 to anticipate the upcoming generation for the next 15 years. Assessing the education levels of the population aged 5-9 and 10-14 is needed to better anticipate the future potential of Indonesia's labor force before 2030.

In terms of percentage, young persons are declining and will continue to decline in the future as seen in Figure 2.11. Almost all provinces, except for Jakarta, are experiencing a declining percentage of population aged below 15. This declining percentage of young people will ease the burden on the economy and ensure a sufficient quantity of goods and services are available to meet their needs. Declining family sizes provide each child with an advantage of extra resources as the parents are also better off compared to parents in the 1960's and 1970's. A smaller family size gives parents the chance to improve and extend their career, as well as enjoy a more mobile lifestyle. As a result, this trend brings Indonesia closer to its goal to reach universal primary education and a reduction of child mortality.

FIGURE 2-11

Number and Percentage Share of Population Aged 0-14: Indonesia, 2010 - 2030



Source: Drawn from Table 2.7

By 2030, Yogyakarta and East Java will have the smallest percentage of younger population below 15, at 19.8 and 19.4 percent, respectively. Whereas, in the province of East Nusa Tenggara this age group will account for almost one third of the provincial population (31.8 percent). However, Table 2.8 illustratesan overall trend of declining proportions of young people aged below 15 in all provinces. As a result of the declining numbers, there will be a corresponding reduction in pressure to meet the needs of young people.

TABLE 2-8

Percentage of Young Population Aged below 15 by Province: 2010 -2030

Province	2010	2015	2020	2025	2030
Aceh	32.3	31.5	30.5	28.5	26.2
North Sumatera	32.9	32.0	30.8	28.8	26.6
West Sumatera	31.1	30.3	29.2	27.5	25.7
Riau	32.6	31.2	29.8	28.2	26.3
Jambi	30.2	28.2	26.1	24.2	22.4
South Sumatera	29.9	28.9	27.6	25.9	23.9
Bengkulu	30.1	28.5	27.0	25.3	23.6
Lampung	29.0	28.2	27.1	25.2	22.8
Bangka Belitung	29.1	27.6	26.2	24.8	23.2
Riau Archipelago	29.9	30.9	28.9	25.8	22.9
Jakarta	24.2	24.8	24.7	23.2	20.2
West Java	28.8	27.2	25.7	24.3	22.6
Central Java	26.2	24.7	23.2	21.7	20.3
Yogyakarta	22.1	21.8	21.5	20.9	19.8
East Java	24.6	23.2	21.9	20.5	19.4
Banten	29.9	28.6	27.4	25.6	23.1
Bali	25.6	24.5	22.8	21.2	20.1
West Nusa Tenggara	31.2	30.1	28.9	27.1	25.3
East Nusa Tenggara	36.5	35.1	33.7	32.6	31.8
West Kalimantan	30.9	29.6	28.3	26.7	24.8
Central Kalimantan	30.6	28.6	26.7	24.9	23.1
South Kalimantan	29.4	28.8	27.7	25.8	23.6
East Kalimantan	30.4	28.7	26.9	25.2	23.2
North Sulawesi	26.9	25.8	24.5	23.2	21.7
Central Sulawesi	30.2	29.0	28.0	26.9	25.3
South Sulawesi	30.5	28.8	27.5	26.2	24.7
Southeast Sulawesi	35.1	33.7	32.2	30.1	28.4
Gorontalo	30.6	28.4	27.1	26.1	24.9
West Sulawesi	33.6	31.8	30.8	29.8	28.6
Maluku	34.7	33.3	32.3	31.3	29.9
North Maluku	35.1	33.7	32.0	30.1	28.4
West Papua	33.1	31.2	29.4	27.8	26.3
Papua	33.5	30.7	28.5	26.8	25.2
Indonesia	28.6	27.3	26.1	24.6	22.9

Source: Compiled from Bappenas, BPS &UNFPA (2013)

It is projected that the number of births will continue to decline slowly from 5.0 million in 2010, to 4.9 million in 2015, and gradually to 4.4 million in 2030 (Bappenas, BPS & UNFPA 2013). One key protection for all babies is the right to an identity. Many young children still lack this basic right with only 42.8 percent of children under 5 holding an official birth certificate, as identified by the 2005 Intercensal Population Survey (Badan Pusat Statistik 2006). The Government of Indonesia must build and sustain the capabilities to register births for freeto ensure every babyand child counts.

2.2.3 Youth (15-24 years old)

As a category, youth does not have a clear cut-off age and its meaning varies from one society to another. However, youth is generally associated with ages ranging from the age of leaving compulsory education to entering the labor market for the first time. For statistical purposes, the United Nations defines youth as the population aged between 15 and 24 years old.

Youth is typically considered a transitional period in the life course between the period of childhood dependence and adult independence. This group represents an important foundation for the nation's future success and pathway to sustainable development. Youth is a life stage gaining significance as children transit into adulthood while furthering their education, entering the labor market, starting their reproductive life, forming families, and becoming active citizens. This stage prepares a child for adult life and shapes their future. From a national perspective,such transitions define future communities and countries.As youth become the productive age population, their youth years affect the quantity and quality of the working-age population and whether they are able to participate in the labor force.

Demographic trends in countries where fertility has fallen significantly during the past few decades can create a relatively high concentration of the youth population. This is referred to as the "youth bulge," indicating a high percentage of youth (above 20.0 percent)relativeto the total population. The youth bulge is considered an echo-effect of a vital demographic transition where fertility and mortality rates have declined from high to low levels about 15 years earlier. This results in a potentially large supply of a young working-age population and may hold benefits for economic development. On the other hand, the youth bulge can indicate a fragile situation, due to its transitional nature, and hold potentially undesirable social and political consequences, such as violence and crime.

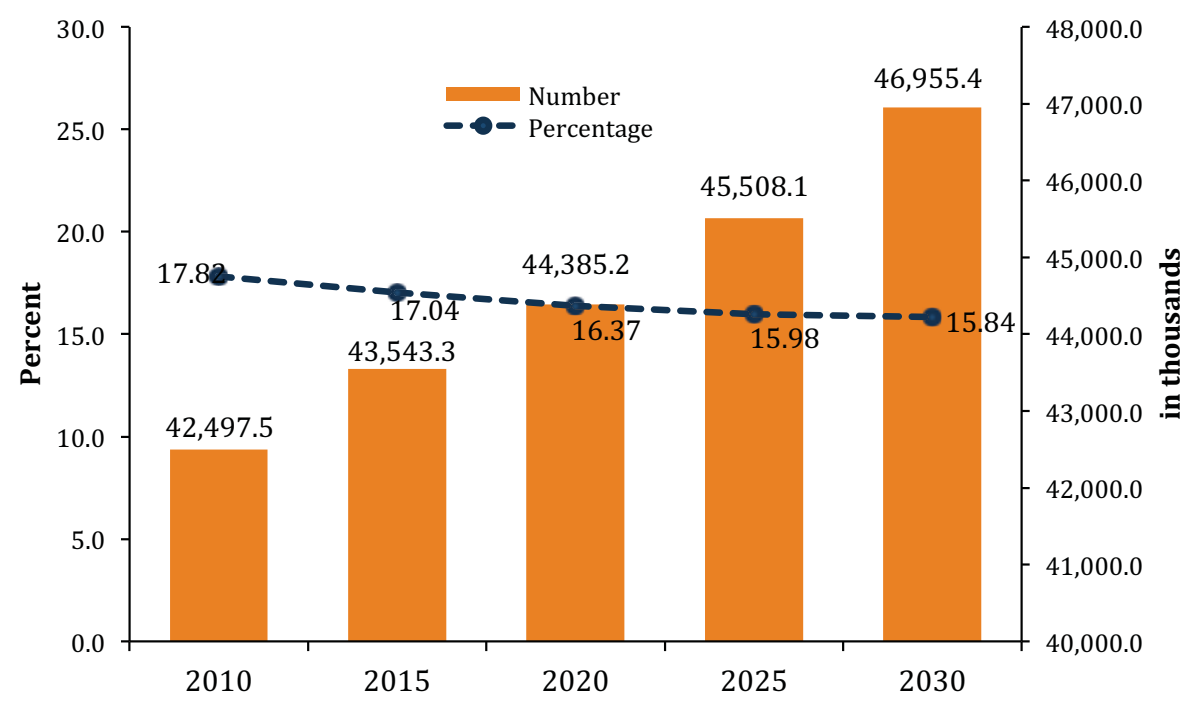
At the global aggregate level, the youth bulge has disappeared. The global number of youth reached 1.22 billion in 2010, or 17.69 percent of world's population. This percentage has been on the decline since reaching its peak in 1985, and will continue to decline to 15.16 percent in 2030.

Indonesia follows the global trend of a disappearance in the youth bulge. In 1998 when Indonesia turned from an authoritarian to democratic regime, the youth had reached peak numbers at 20.9 percent in 1990. This declining trend continued and youth accounted for more than 20.0 percent of the population from 1990 to 2000. In terms of relative numbers, Indonesia's share of youth in the future population has been steadily decreasing since its peak in 1990. As a result, the pressure from youth will weaken as the proportion of youth will decline from 17.82 percent in 2010, to 17.04 percent in 2015, and finally down to 15.84 percent in 2030.

However, the decrease in percentage of youth should not diminish their significance. In absolute numbers, the youth in Indonesia will continue to increase from 42.5 million in 2010, to the projected 43.5 million in 2015, and 47.0 million in the next 15 years (Figure 2.12). For Indonesia, the ages of 15-24 is a crucial period to prepare for a better future in terms of education - finishing junior high school, entering and completing senior high school, and possibly, tertiary education.

FIGURE 2-12

Number and Percentage of Youth: Indonesia, 2010-2030



Source: Drawn from Bappenas, BPS and UNFPA (2013).

For now, the increasing trend in the number of youth will continue to exert pressure on society and require an expansion of tertiary education, health and employment. However, if this segment of the population is properly prepared once they enter the working age population, these same youth can be the drivers of Indonesia's sustainable development to build the future Indonesia wants.

In 2010, the percentage of the youth population in the provinces ranged from the lowest of 15.80 percent in East Java to the highest of 20.63 percent in Papua. The three provinces of Aceh, West Papua and Papua had a youth population larger than 20.0 percent of their total population (Table 2.9). However, in 2015 all provinces are projected to balance out with a youth population below 20.0 percent.

TABLE 2-9

Percentage of Population Aged 15-24 by Province: Indonesia, 2010-2030

Province	Percentage				
	2010	2015	2020	2025	2030
Aceh	20.27	18.47	17.20	17.34	17.75
North Sumatera	18.85	18.16	17.79	17.91	18.20
West Sumatera	18.03	17.45	17.25	17.25	17.35
Riau	19.77	18.20	17.00	16.58	16.47
Jambi	19.08	17.73	16.91	16.34	15.62
South Sumatera	19.38	17.57	16.65	16.48	16.52
Bengkulu	19.07	17.80	16.90	16.32	16.04
Lampung	18.31	17.06	16.23	16.15	16.51
Bangka Belitung	19.16	17.50	16.32	15.75	15.42
Riau Islands	18.49	13.88	14.91	17.36	17.50
DKI Jakarta	19.21	15.63	13.75	13.97	15.24
West Java	18.17	17.44	16.59	15.82	15.54
Central Java	16.02	16.15	15.83	15.25	14.79
DI Yogyakarta	16.85	15.61	14.44	14.27	14.41
East Java	15.80	15.63	15.26	14.76	14.24
Banten	19.60	17.83	16.32	15.86	16.34
Bali	16.10	15.37	15.32	15.52	14.60
West Nusa Tenggara	18.45	17.83	17.26	17.17	17.22
East Nusa Tenggara	17.47	18.57	19.17	1.89	18.19
West Kalimantan	19.40	18.05	17.06	16.57	16.64
Central Kalimantan	19.33	17.78	16.61	15.83	15.33
South Kalimantan	18.14	16.78	16.17	16.36	16.80
East Kalimantan	18.89	17.24	16.34	15.77	15.45
North Sulawesi	17.24	16.53	16.09	15.62	15.34
Central Sulawesi	18.14	17.62	16.81	16.06	16.24
South Sulawesi	18.15	18.27	17.72	16.86	16.60
Southeast Sulawesi	18.76	18.26	17.96	18.15	17.95
Gorontalo	19.02	18.81	17.65	16.46	15.95
West Sulawesi	18.56	18.66	18.11	17.10	16.83
Maluku	19.31	18.93	18.45	17.78	17.62
North Maluku	18.74	18.01	18.08	18.10	17.77
West Papua	20.45	18.49	17.52	16.92	16.31
Papua	20.63	19.64	18.35	17.19	16.32
Total	17.82	17.04	16.37	15.98	15.84

Source: Compiled and calculated from Bappenas, BPS & UNFPA (2013)

2.2.4 Working-age Population (25-59 years old)

The working age, spanning over 35 years, covers a substantial portion of peoples' lives. If the average life expectancy is 70 years, the average person will spend around 50 percent of their lives participating in the labor market. Therefore, issues of decent jobs, fair income, unemployment, training, life-long learning, as well as work-life balance are very important to this age group.

The working-age population is the earning population and are those whom should accumulate assets and save to consume after retirement. However, over the course of 35 years, their marketability may decrease with a deterioration of their skillset and health. Therefore, to remain competitive and continue to support the dependent age groups, this working-age population should continuously update their skills and remain healthy.

In 2010, this population numbered almost 110 million (46.1 percent of population). In the next 20 years, their numbers will continue to increase from 120.4 million in 2015 (47.1 percent) to 140.6 million in 2030 (Table 2.10). The working age population is projected to reach its peak at 47.6 percent in 2025, followed by a slight decline to 47.4 percent in 2030. This large percentage of prime working age population has great potential for development if the appropriate policies are in place to take advantage of this demographic bonus, as discussed earlier.

At the provincial level (Table 2.11), Jakarta will be the only province with a prime working age population consistently above 50 percent. By 2030, six other provinces will join Jakarta with a working age population above 50 percent including: Jambi, Bangka Belitung, Riau Archipelago, Central Kalimantan, East Kalimantan and Papua.

TABLE 2-10

Working-age Population (25-59) by Province: Indonesia, 2010-2030 (in thousands)

Province	Number				
	2010	2015	2020	2025	2030
Aceh	1,885.4	2,190.8	2,463.6	2,682.8	2,876.2
North Sumatera	5,519.8	5,997.5	6,346.9	6,634.1	6,869.2
West Sumatera	2,082.7	2,262.0	2,392.5	2,523.5	2,643.7
Riau	2,428.8	2,903.0	3,364.2	3,761.5	4,131.5
Jambi	1,406.9	1,619.3	1,800.6	1,949.5	2,078.6
South Sumatera	3,331.5	3,748.4	4,058.3	4,278.7	4,458.9
Bengkulu	775.8	886.3	975.6	1,048.5	1,107.5
Lampung	3,471.5	3,805.8	4,041.9	4,192.2	4,275.0
Bangka Belitung	585.7	661.2	749.8	828.1	896.7
Riau Archipelago	817.0	1,011.4	1,148.7	1,261.3	1,417.2
Jakarta	4,960.9	5,403.7	5,661.1	5,748.8	5,776.9
West Java	19,893.8	22,097.6	23,964.7	25,490.4	26,534.9
Central Java	15,393.8	16,006.5	16,437.8	16,789.6	16,993.6
Yogyakarta	1,669.0	1,809.1	1,918.2	1,969.4	2,010.5
East Java	18,509.1	19,283.3	19,701.5	19,879.4	19,789.4
Banten	4,909.3	5,769.8	6,522.4	7,138.4	7,590.2
Bali	1,901.1	2,067.8	2,206.4	2,290.7	2,355.7
West Nusa Tenggara	1,954.2	2,148.3	2,344.2	2,455.7	2,566.5
East Nusa Tenggara	1,820.5	1,984.7	2,160.0	2,364.8	2,575.0
West Kalimantan	1,989.7	2,182.9	2,386.4	2,548.8	2,674.2
Central Kalimantan	1,008.7	1,208.9	1,395.2	1,558.2	1,697.9
South Kalimantan	1,702.5	1,911.7	2,076.5	2,201.2	2,299.9
East Kalimantan	1,669.6	1,988.6	2,276.2	2,529.8	2,757.0
North Sulawesi	1,080.0	1,156.4	1,210.8	1,249.8	1,272.9
Central Sulawesi	1,193.2	1,327.1	1,447.5	1,554.5	1,628.4
South Sulawesi	3,480.0	3,758.8	4,010.9	4,232.7	4,351.5
Southeast Sulawesi	906.4	1,044.5	1,175.0	1,304.6	1,422.2
Gorontalo	464.9	517.9	571.7	618.1	650.2
West Sulawesi	485.0	553.8	622.8	694.7	751.8
Maluku	614.7	693.8	767.5	840.8	909.1
North Maluku	432.4	496.6	553.7	613.0	671.7
West Papua	330.5	404.2	472.4	534.3	594.5
Papua	1,242.4	1,473.9	1,688.9	1,860.7	1,982.7
Total	109,916.8	120,375.6	128,913.9	135,628.6	140,611.2

Source: Compiled and Calculated from Bappenas, BPS & UNFPA (2013)

TABLE 2-11

The Percentage of Prime Working-age Population (25-59) by Province: Indonesia, 2010-2030 (in Percentage)

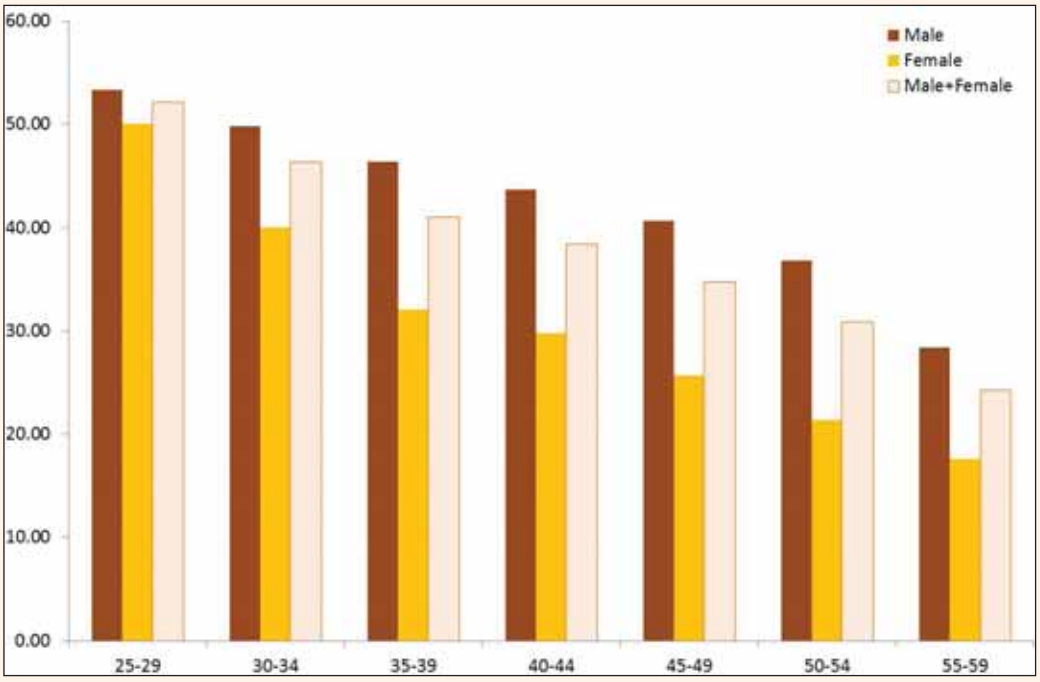
Province	Percentage				
	2010	2015	2020	2025	2030
Aceh	41.68	43.80	45.12	45.70	46.18
North Sumatera	42.37	43.03	43.17	43.33	43.58
West Sumatera	42.81	43.53	43.51	43.83	44.30
Riau	43.57	45.76	47.19	47.62	47.80
Jambi	45.27	47.60	48.96	49.65	50.18
South Sumatera	44.53	46.55	47.37	47.54	47.71
Bengkulu	45.05	47.27	48.30	48.76	48.91
Lampung	45.47	46.89	47.43	47.51	47.36
Bangka Belitung	47.61	48.16	49.41	49.96	50.13
Riau Archipelago	48.26	51.26	51.23	50.42	51.19
DKI Jakarta	51.46	53.09	53.18	52.10	51.08
West Java	46.02	47.31	47.99	48.29	48.08
Central Java	47.45	47.39	47.05	46.69	46.24
DI Yogyakarta	48.13	49.17	49.41	48.45	47.64
East Java	49.27	49.64	49.39	48.91	48.18
Banten	45.93	48.26	49.56	50.10	49.93
Bali	48.65	49.79	50.37	49.95	49.43
West Nusa Tenggara	43.27	44.43	45.74	45.68	45.96
East Nusa Tenggara	38.68	38.76	38.98	3.96	40.22
West Kalimantan	45.10	45.58	46.48	46.92	47.09
Central Kalimantan	45.42	4.85	50.38	51.41	51.87
South Kalimantan	46.74	47.91	48.25	48.08	47.77
East Kalimantan	46.69	48.88	49.90	50.19	50.15
North Sulawesi	47.42	47.94	47.88	47.62	47.21
Central Sulawesi	45.09	46.13	46.74	47.11	46.79
South Sulawesi	43.17	44.12	44.92	45.68	45.70
Southeast Sulawesi	40.40	41.79	42.64	43.44	43.93
Gorontalo	44.50	45.70	46.88	47.56	47.45
West Sulawesi	41.65	43.19	44.33	45.47	45.64
Maluku	39.87	41.14	41.90	42.62	43.20
North Maluku	41.45	42.73	43.30	44.07	44.80
West Papua	43.19	46.38	48.12	48.92	49.54
Papua	43.49	46.80	49.16	50.27	50.33
Total	46.08	47.12	47.56	47.62	47.44

Source: Compiled and Calculated from Bappenas, BPS & UNFPA (2013)

In 2010, the prime working-age population actively involved in the labor market exhibited a participation rate shaped like an inverse-U ranging from 69 percent for the 25-29 age group, 78 percent at its peak for the 45-49 year olds, and then back down to 72 percent for the ages of 55-59. Females, on average, have lower participation rates. With regards to employment status, females are less likely than their male counterparts, to work in formal sectors either as employees or employers. As seen in Figure 2.13, the sex differential between female and male working in the formal sector grows larger as the age group gets older.

FIGURE 2-13

Percentage of Those Working in Formal Sector by Age and Sex: Indonesia, 2012



Source: Calculated from Sakernas (2012).

Labor issues have many dimensions including earning inequalities which can take on demographic or socio-economic characteristics such as earning disparitiesdue to education level.Table 2.12shows the average salary per month of an employee working in the formal sector based on the National Labor Force Survey (Sakernas) in May 2013. The table shows that employees with only a primary education earned less than one million rupiah per month, while employees with a junior high school earned about one million rupiah. Those with a high school education level, earned an average of a half million rupiah more than junior high school graduates. A significant difference is also shown for those holding tertiary education.

Improving skills through education opens the possibility for higher earnings and higher productivity. Thus, skillset improvement becomes a key indicator and tool for Indonesia to reap the bonus from the increasing working age population in the next 15 years. If this bonus can be realized, the saving rates may increase and opportunity emerges to accumulate assets to draw on during old age.

TABLE 2-12

Working hours per Week and Salary per Month of an Employee: May 2013

Educational Attainment	Working hours / week	Salary per month
No Schooling	41	815,162
Did Not Complete/Not Yet Completed Primary School	43	882,654
Primary School	46	963,843
Junior High School	47	1,061,329
Senior High School (General)	45	1,619,938
Senior High School (Vocational)	46	1,573,173
Diploma I/II/III/Academy	39	2,821,749
University	38	4,980,729
Total	44	1,675,728

Source: Central Bureau of Statistics (2013c) Sakernas (2013)

Table 2.12 also reflects an important trend where higher earnings are gained with shorter working hours. For example, employees holding university degrees had the shortest working hours per week with 38 hours which is almost 10 hours shorter than those holding junior high school degrees. This illustrates how the more educated employees have more time for leisure. The benefits of education in earning power and increased leisure time are clear. It is the right of every Indonesian to strive for a better education regardless of location, whether that be the Western or Eastern regions or in urban or rural areas.

2.2.5 Older Persons (60 years old and over)

The twenty-first century is projected to be the age of aging. Following the global trend, an aging population is also emerging in Indonesia. A decline in fertility has changed the age structure of the population and is one of the main drivers of this trend. Global statistics show that 40 percent of the world's population live in countries with below replacement levels of fertility and 13 percent live in countries with very low fertility (Ogawa & Matsukura 2005). At the same time, mortality rates are decreasing and life expectancy is increasing. As a result, the age structure of the population is changing toward an older population.

Indonesia is projected to experiencean unprecedented growth of older persons, those aged 60 and above. The number of older persons aged 60 years and above will be about 41.0 million in 2030, almost double that of 2015 numbers. Their numbers have grown rapidly at 3.2 percent annually with an increase from 5.3 million in 1971 to 15.8 million in 2005. This growth rate will be accelerating in the next several decades at a rate higher than the growth of the total population. For instance, from 2010-2015 the annual growth rate of the number of older persons will be approximately 3.68 per cent, in contrast tothe annual growth rate of the total populationat 1.37 percent (Table 2.13). The rapid growth in older persons raises the need to re-examine their roles moving forward.

TABLE 2-13

Annual Rate of Growth of Older Persons in Comparison with Other Groups of Population: Indonesia, 2010-2030

Age Groups	2010-15	2015-20	2020-25	2025-30
0-14	0.50	0.24	-0.20	-0.61
15-24	0.49	0.38	0.50	0.63
25-59	1.83	1.37	1.02	0.72
60+	3.68	4.45	4.37	3.90

Source: Calculated from Bappenas, BPS and UNFPA (2013)

The percentage of the aging population stands at 7.6 percent of the total population in 2010. Moving forward, there is an expected increase to 8.5 percent by 2015. In 2025, that percentage will rise to 11.8 percent, and finally, 13.8 percent by 2030.

At the provincial level, the province of Yogyakarta currently has the largest share of older population with nearly 13 percent of their population (Table 2.14).Central Java and East Java will soon follow this trend. All three aging provinces in Indonesia are on the island of Java and are home to the majority of the Javanese community, thus highlighting how the aging issues will also become an issue for the Javanese community.

TABLE 2-14

Future Share of Older Persons by Province Ordered by the Figure in 2030: Indonesia, 2010-2030

	Year				
Province	2010	2015	2020	2025	2030
Central Java	10.3	11.8	13.9	16.4	18.7
East Java	10.4	11.5	13.5	15.8	18.2
Yogyakarta	12.9	13.4	14.7	16.4	18.2
Bali	9.7	10.3	11.5	13.4	15.9
North Sulawesi	8.4	9.7	11.6	13.6	15.7
West Java	7.0	8.1	9.7	11.6	13.8
Jakarta	5.1	6.5	8.4	10.8	13.5
Lampung	7.2	7.9	9.3	11.2	13.3
South Sulawesi	8.2	8.8	9.8	11.2	13.0
West Sumatera	8.1	8.8	10.1	11.4	12.7
Jambi	5.5	6.5	8.0	9.9	11.9
South Kalimantan	5.8	6.5	7.9	9.7	11.8
South Sumatera	6.2	7.0	8.4	10.0	11.8
Central Sulawesi	6.6	7.3	8.4	9.9	11.7
Gorontalo	5.9	7.1	8.4	9.9	11.7
North Sumatera	5.9	6.8	8.3	10.0	11.7
West Nusa Tenggara	7.1	7.7	8.7	10.0	11.5
West Kalimantan	5.8	6.8	8.2	9.8	11.5

	Year				
Province	2010	2015	2020	2025	2030
Bengkulu	5.8	6.5	7.8	9.6	11.4
East Kalimantan	4.0	5.2	6.8	8.9	11.2
Bangka Belitung	5.8	6.8	8.1	9.5	11.2
Banten	4.6	5.3	6.7	8.5	10.7
Aceh	5.7	6.3	7.2	8.4	9.8
East Nusa Tenggara	7.4	7.5	8.1	9.0	9.8
Southeast Sulawesi	5.8	6.3	7.2	8.3	9.7
Central Kalimantan	4.6	5.2	6.3	7.8	9.7
Riau	4.0	4.8	6.1	7.6	9.4
Maluku	6.2	6.6	7.4	8.3	9.3
North Maluku	4.8	5.5	6.6	7.7	9.0
West Sulawesi	6.2	6.3	6.8	7.6	8.9
Riau Archipelago	3.4	4.0	5.0	6.4	8.4
Papua	2.4	2.9	4.0	5.8	8.1
West Papua	3.2	4.0	5.0	6.3	7.9
Indonesia	7.6	8.5	10.0	11.8	13.8

Source: Compiled from Bappenas, BPS &UNFPA (2013)

However, by 2030 a different picture emerges as the majority of provinces will have a percentage of older persons above 10% of the total population (Figure 2.14). The province of West Papua will have the smallest percentage of older persons in their total population.Into the future, regional differencesin the aging population will continue to exist across provinces and this trend will remain for the next several decades.

FIGURE 2-14

Percentage of Older Persons Aged 60 and Above by Provinces: Indonesia, 2030

Source: Drawn from Table 2.18 by Narwawi Pramudhiarta.

At the district level, some districts in Yogyakarta, such as Gunung Kidul and Kulon Progo, are already old populations. However, the infrastructure in these districts is insufficient to accommodate the needs of older persons. Moving forward, ensuring districts and provinces are ready to accommodate this aging population is another critical issue for sustainable development by 2030.

Similar to youth, the age group of older persons is not easily defined as there is no clear onset of being an older person. The United Nations uses 60 years old as a standard definition of older persons (World Health Organization 2002). However, being old is a relative concept. When life expectancies are increasing to above 70 years old, 60 does not seem old. However,60can be considered 'very-very old' when life expectancies are lower, for instance at 45 years. Therefore, chronological age is not a precise marker to define someone as an older person. The World Health Organization (WHO)suggests it is more important to look at the variations in health status, participation, and levels of independence among people of the same age. To do so, requires different policy interventionsin order to increase the wellbeing of older persons.

In Indonesia, retirement age is 55 years in the private sector, 58 years for civil servants, and almost 70 years for specific occupations such as university professors. The retirement age in Indonesia originates from Law no. 4/1965 on Provision of Assistance for Frail Older Persons' Livelihood that defines older persons as those aged 55 years and above. The 1971 census revealed that life expectancy at birth from 1967-71 was only 45.7 years; a figure much lower than the civil servant retirement age of 56 as stated in Law no.32/1979 (Table 2.15). Therefore, at that time many people in Indonesia passed away before having the opportunity to retire.

TABLE 2-15

Indonesian Regulation on Civil Servant Retirement Age and Average Life Expectancy

No.	Law and Regulation	Life expectancy at birth	Pension Age of Government Official	Remarks
1	Law No.8 1974 about Main Points of Government Official Staffing	47.2 for female in 1971	56	Life expectancy is less than pension age
2	Government Regulation No. 32, 1979 about Dismissal of Government Officials	44.2 for female in 1971		
3	Law No. 5, 2014 about State Civil Apparatus	70.1 in 2010	(1) 58 for low-to-middle ranked officials	Life expectancy is now more than pension age
4	Government Regulation No. 21, 2014 about Pension Age of Functional Officials	71 for female in 2010 67.9 for female in 2010	(2) 60 for high ranked officials (3) 65 for functional officials (very limited in number)	Wide gap: 10 to 12 years for low-to-high ranked officials

Source: Authors' compilation

Interestingly, the retirement age has remained around 55-58 years despite an increase in expectancy of life at birth to above 70 years. This means an increasing number of people have been and will retire in their lifetime. Furthermore, they will be retired for a longer period of time. With expectancy of life at birth above 70 years, the current older persons retiring at 55 are expected, on average, to live in retirement for almost 22 years (United Nations 2013). In this scenario, if pension benefits are given from the retirement age of 55, they will have to be paid for almost 22 years. Therefore, the expected retirement period is an important fiscal policy issue in an aging population and Indonesia is moving closer toward that point. If the retirement age remains at the current age, the retirement period will increase as life expectancy increases which may incur more costs to government. Instead, the retirement age should be increased to reflect the improvement in life expectancy and a forced retirement age should be eliminated. This will ensure the older persons remain active and productive in the labor market which can increase fiscal sustainability.

Another critical issue is whether the pension benefits (if they exist) are large enough to keep older persons from falling into poverty. In the absence of pensions, older persons need other means of support during their retirement period. Their income level, including transfers from others, is often a major determinant of such support. Several studies in Indonesia found that the main source of income among older persons is from labor (Arifin, Braun &Hogervorst2012; Rahardjo et al. 2009; Adioetomo 2013). In particular, the elderly low-income families can hardly accumulate assets and thus rely on other means to fund their consumption, such asextending their working period, relying on government support, receivingsupport from other family members,borrowing money, or spendingassets accumulated earlier. In Indonesia, the labor force participation rate of older persons remains

high with the male participation higher than the female (Arifin & Ananta 2009; Maliki 2011; Adioetomo 2013). The latest 2010 population census shows that slightly more than half of the older persons are actively involved in the labor market (51.2 percent), with a much lower rate for females (35.3 percent) than for males (69.9 percent) (Adioetomo 2013). However, a large portion of still-working older women worked as unpaid family workers, possibly as a means for survival support (Arifin & Ananta 2009; Adioetomo 2013).

The increasing number of older persons, in the context of limited social security system and/or welfare assistance, will be a challenge to the financial condition of the country. In January 2014 Indonesia launched Universal Health Care (UHC), known as Jaminan Kesehatan National (JKN) which is the implementation of the 2004 National Social Security System (Sistem Jaminan Sosial Sekuriti, or SJSN). Membership is compulsory through a premium paid to the Badan Penyelenggara Jaminan Sosial (BPJS), an agency set up as the implementing body (i.e. insurance carrier). For those who cannot afford to pay, the premium is paid by the government referred toas Penerima Bayaran Iuran (PBI).

Such steps may be a solution for poor older persons to cover their health expenses. However, this system has yet to be disseminated widely among older persons in need, especially the poor and illiterate. Other government interventionstaking place, such as Asistensi Sosial Lanjut Usia (ASLUT),are cash transfers of Rp.200.000 a month for those aged 70 years who are poor and neglected (*terlantar*). Typically, the coverage is too low to cover the entire older population who are in need of economic support (Adioetomo etal. 2014).

Another important issue among the older population is the feminization of aging. Adioetomo (2013) found that in 2010 just above a half, or 51.7 percent, of Indonesians aged 60-64 years were women. This percentage was even higher among those aged 80-84rising to 57.9 percent, and finally reaching 65.5 percent at age 95 years and above. This points to the feminization of older persons and suggests development planning should pay attention to this feminization phenomenon.

The 2010 census also revealed that 18.4 percent of the oldest women (aged above 80 years) lived alone. This figure was more than double the percentage of older men at the same age living alone (7.5 percent). Furthermore, disability also increased with age where the percentage of women suffering from hearing, seeing, and physical difficulties were women aged 80-84 years. About 5.4 percent of older women aged 80-84 years, as compared to only 4.1 percent of older men, suffered from severe difficulties in seeing.Similarly, 5.3 percent of older women compared to only 4.5 percent suffered from severe hearing difficulties, furthermore 4.6 percent of women compared to only 3.0 percent of men suffered from physical/ mental difficulties. In addition, 5.4 percent of older women between 80-84 years old experienced suffering from severe difficulties in basic self-care, as compared to 3.6 percent of older men of the same age. One key challenge is how to provide long-term care, especially for women 80 years old and over. In other words, women tend to live longer but not necessarily healthier than older men. Policymakers must develop a means to improve the well-being of older persons while taking into consideration the gender perspective.

The World Health Organization (2012) defines the term “active ageing” as “the process of optimizing opportunities for health, participation and security in order to enhance quality of life as people age.” In support of this concept, efforts must be made to ensure the opportunity for active ageing as Indonesia’s older population continues to grow. As one of the emerging three demographic trends toward 2030,

the age structure transformation will shape Indonesia's process for achieving the three dimensions of sustainable development.

2.3 POPULATION MOBILITY

2.3.1 Internal Migration

Smaller family size and increasing life expectancy, in tandem, with better education and increased income have allowed Indonesians to be highly geographically mobile. Population mobility is also an expression of freedom and the right to live with dignity. Furthermore, Hayes (2011) argues that population mobility can be one major adaptation strategy to climate change. His argument goes against many commentators who fear climate change will result in massive numbers of "climate change refugees" from developing countries to developed countries. He sees this perspective of climate change refugees as too pessimistic, particularly in the immediate future.

Population mobility becomes more complex as it takes into consideration types of mobility, flow, intensity, as well as duration. Official population projections of the Indonesian government assume a constant rate and pattern of population mobility, however, this rate and pattern vary from one province to another.

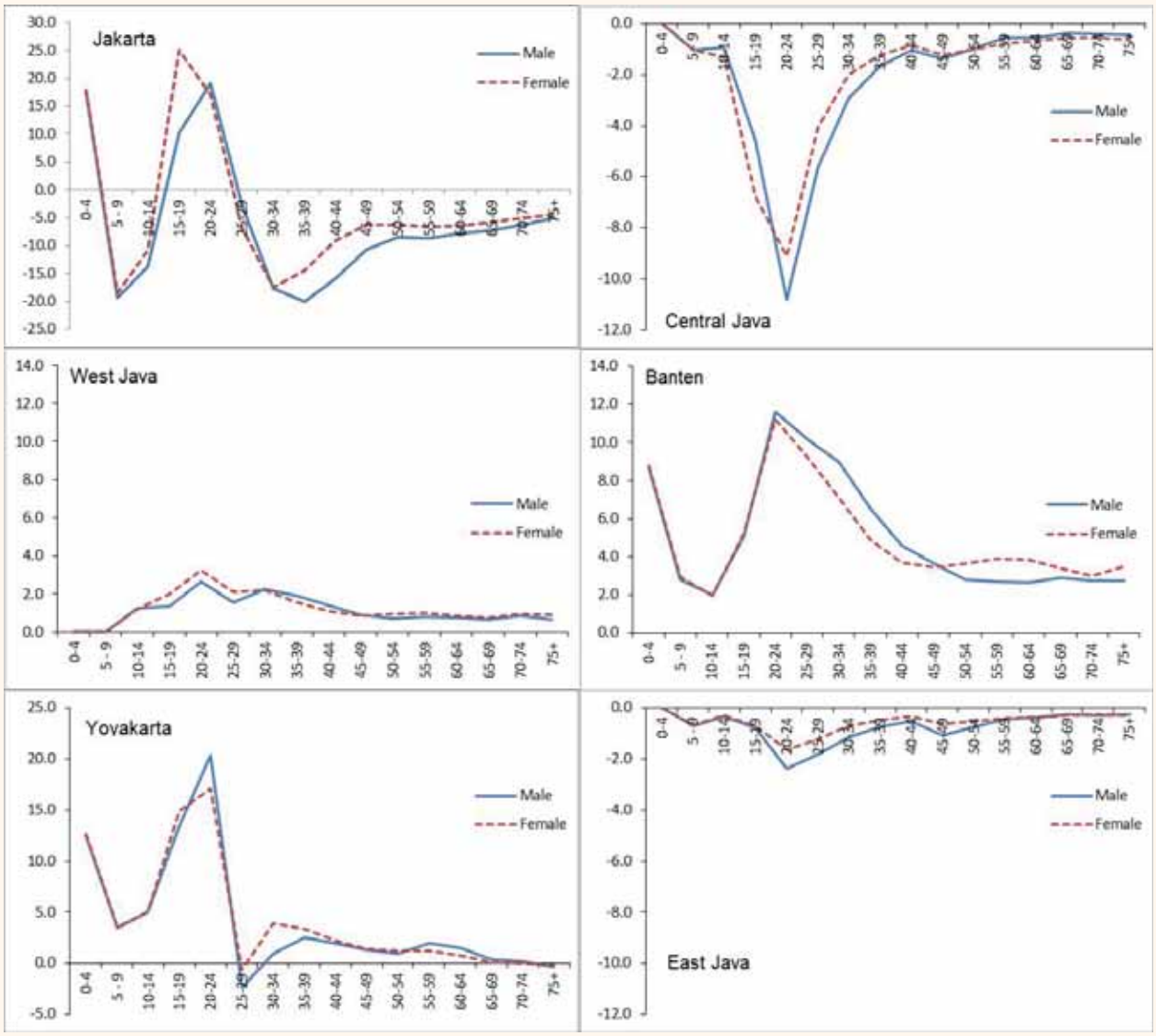
For example, Figure 2.15shows the complex pattern of net-migration by age and gender in each province in 2005-2010. However, it is difficult to assume the pattern will remain the same until 2030 because of factors like urbanization that depend on social and economic development. More specifically, these figures indicate patterns of recent migration measured by residences five years before the census. A positive rate indicates positive net migration, or when the number of in-migrants to a province is greater than the number of out-migrants from the province. Whereas, a negative rate indicates the number of out-migration exceeds that of in-migration. No clear pattern emerges from these figures, however, in general the figure shows the highest migration rate was among the young ages between 15 and 29 with peaks varying from one province to another. This pattern is also seen among young women and men, with men having a higher likelihood of internal migration except in Jakarta where young women are more likely to migrate to this province than young men.

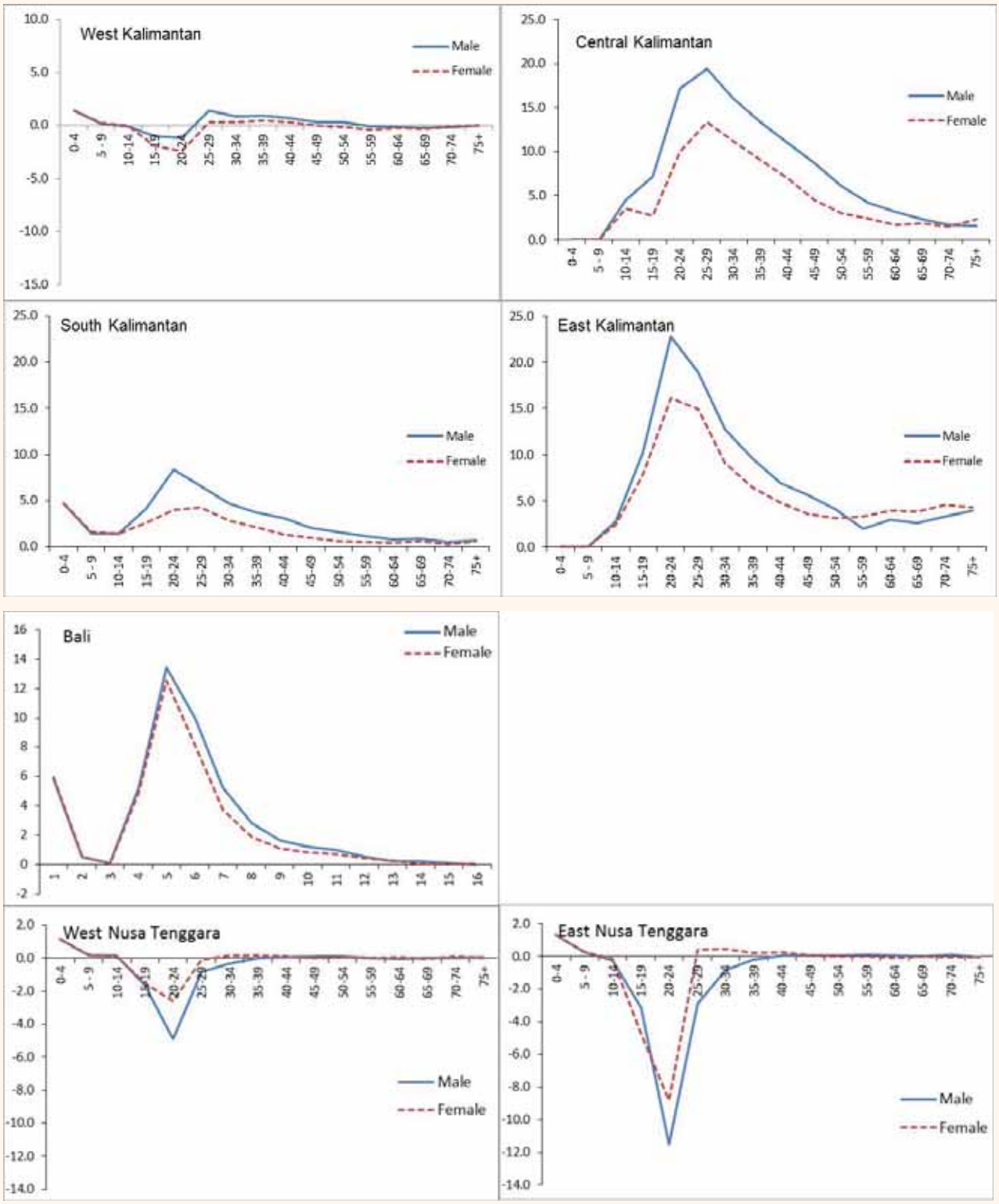
In Jakarta, among age groups there are both positive and negative migration rates. (Figure 2.15). The negative net migration is seen among those aged 25 and above with the highest rate at ages 35-39. In addition, negative migration is seen among the children aged 5 – 14. Meanwhile, a high rate of positive migration is seen among those under 5 years old and those aged 15-19 and 20-24. The high migration rate among young people aged below 15 may reflect the migration decision of their young parents. In other words, this indicates the existence of family migration into and from Jakarta.

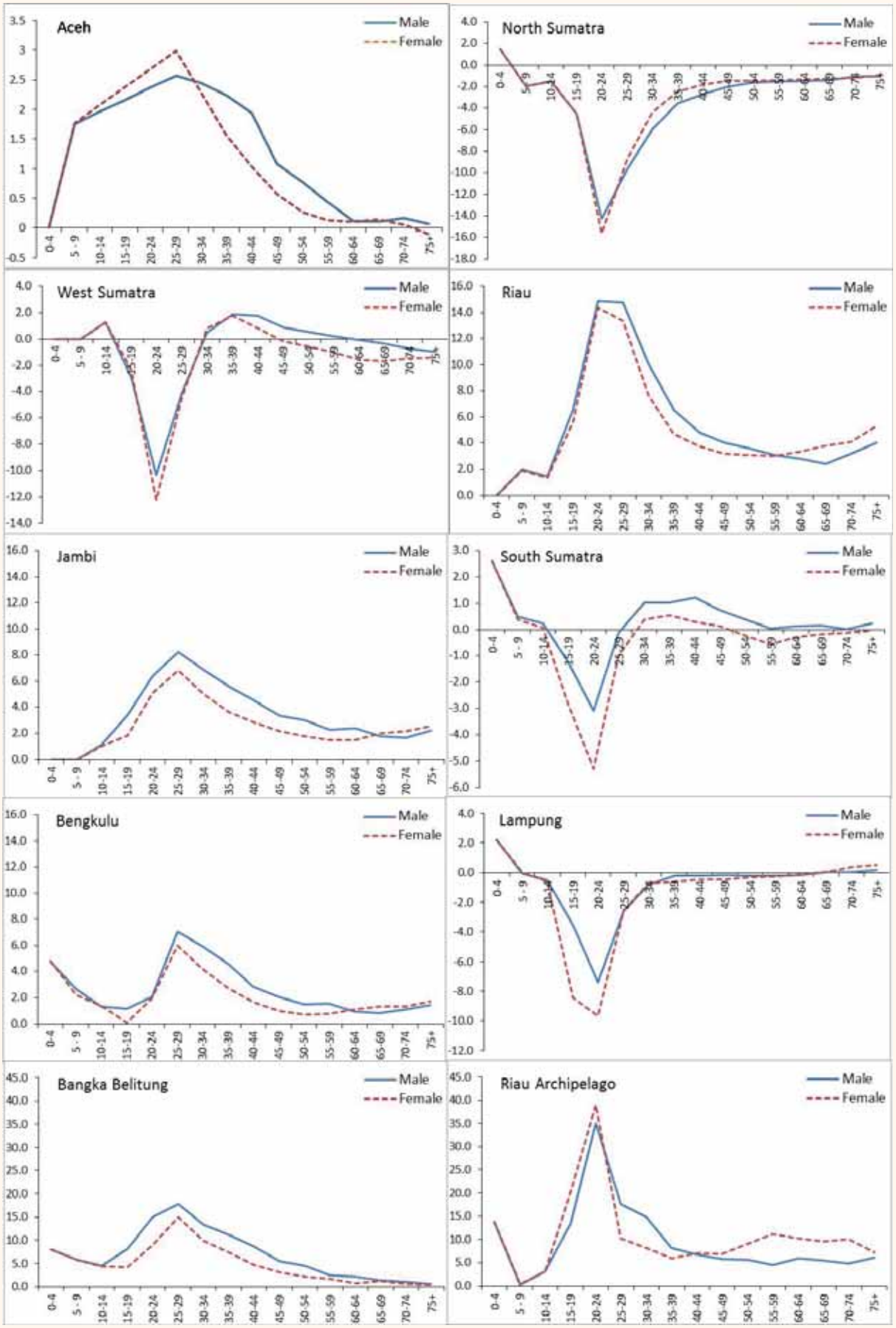
Central Java experiences negative net migration at all ages with a peak from age 20-24. East Java is similar to Central Java, but the rates are smaller. Other provinces experiencing negative net migration are West Nusa Tenggara, East Nusa Tenggara, North Sumatra, West Sumatra, and Lampung. Those provinces with positive net migration include: Banten, Bali, Aceh, Riau, Jambi, Bangka Belitung, Riau Islands, Central Kalimantan, East Kalimantan, Gorontalo, West Sulawesi, Central Sulawesi, and West Papua.

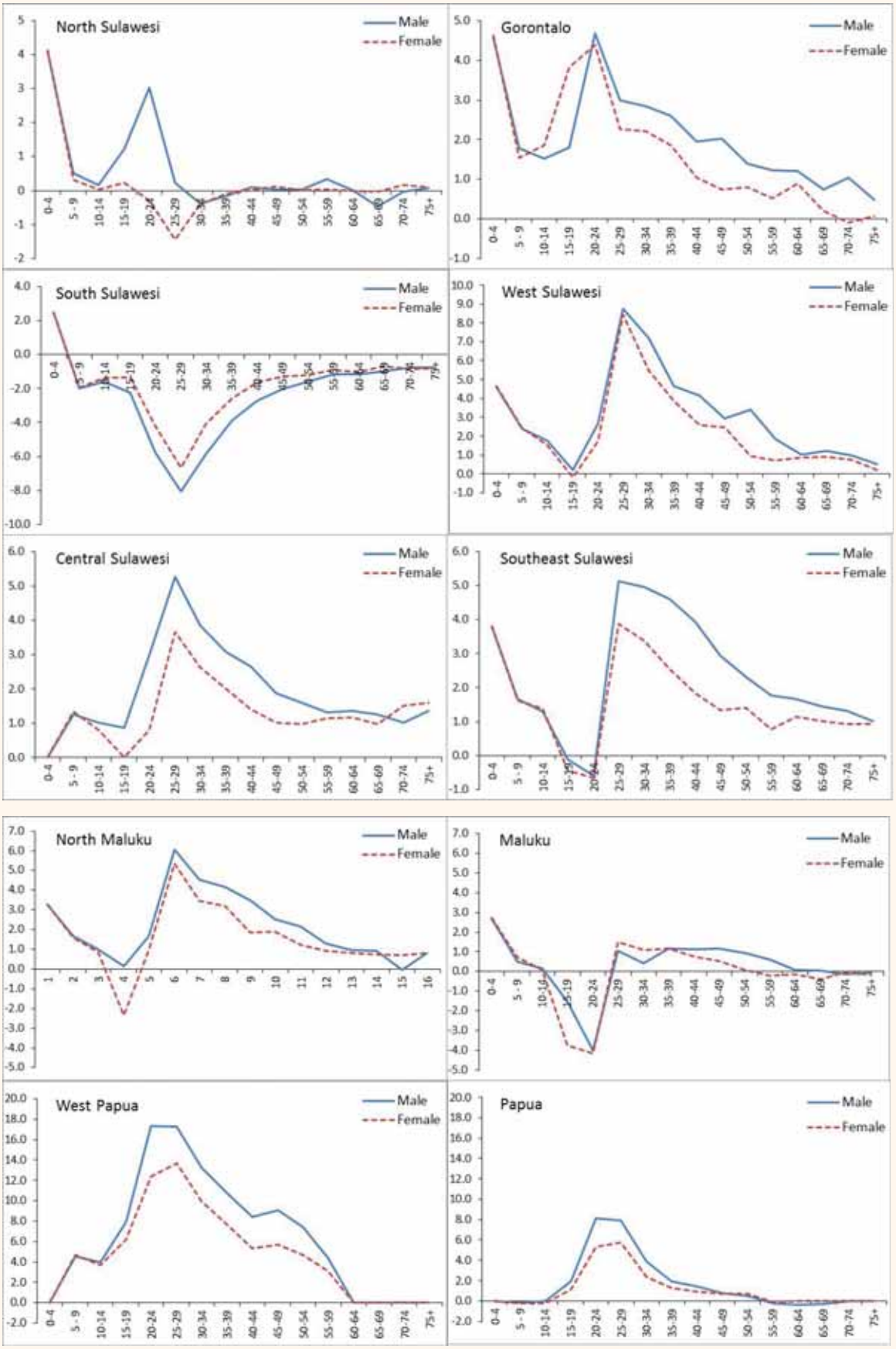
FIGURE 2-15

Pattern of Net Migration Rate by Provinces: 2005-2010




West Kalimantan
Central Kalimantan
South Kalimantan
East Kalimantan
Bali
West Nusa Tenggara
East Nusa Tenggara
Male
Female
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+


Aceh
North Sumatra
West Sumatra
Riau
Jambi
South Sumatra
Bengkulu
Lampung
Bangka Belitung
Riau Archipelago
Male
Female
0-4
5-9
10-14
15-19
20-24
25-29
30-34
35-39
40-44
45-49
50-54
55-59
60-64
65-69
70-74
75+



Source: Drawn from Bappenas, BPS & UNFPA (2013)

It is important to note that the patterns only reflect permanent mobility,which is defined as mobility that involves a change of residence. A person is considered permanent in a given geographical unit (in this casea province), if the person has been staying or intends to stay in the province for at least six months. Ananta and Arifin (2014) also observednon-permanent migration, described as "*wira wiri,*" or moving from one place to another very frequently and in short duration without changing residence. This type of mobility is facilitated by progress in transportation and communication systemsthat have enabled people to be connected everywhere in Indonesia and further abroad.

Non-permanent migration can be seen as an emerging pattern of population mobility in Indonesia, although limited data exists to better understand this trend. Any development program, especially relating to sustainable development, should pay attention to the need for this rising number in non-permanent migration. For example, recent parliamentary elections on 9 April 2014 may not have included many non-permanent persons because they were unable to return to their de jure location for election day.

2.3.2 International Migration

Indonesian Diaspora, Gaining their Brain from Exploring the World

Indonesia's continuous economic progress, shrinking family size, improved human capital, and higher income have enabled Indonesians to move more frequently and over longer distances. Many are going overseas to venture life in other countries andto widen their geographical labor market (Ananta& Arifin 2008; Tirtosudarmo 2009). Ananta and Arifin (2008) examine the trend of population mobility across several decades.It is projected that these levels of high mobility will continue in the future.

Indonesians are on the move and are found in more than fifty countries. This population of diaspora are a benefit to Indonesia and tomany of the receiving countries. One measure of their contribution are monetary remittances, or money made abroad and sent back home to Indonesia. Monetary remittances are on the rise and can be significant source of funding at the regional level of development. Table 2.16looks more closely at the origin of monetary remittances flowing into Indonesia. In 2012, more than half of the remittances came from the Asian countries with the largest portion from Malaysia. Saudi Arabia was another country of large remittance origin to Indonesia.

However, this form of development is not without a cost. Remittances are largely contributed by female migrant laborers who often risk their lives abroad for better income. Evidence shows some of these women end up as victims of abuse and violence. Despite improvements in the average educational level of Indonesian women, further steps are needed to increase their education and self-empowerment before they are able to move abroad as professionals rather than household helpers.

There is an imbalanced sex ratio of Indonesians migrating overseas with a tendency for more women to migrate. Thus, international migration has been feminized in Indonesia. Furthermore, most of these women are in their reproductive ages. The feminization of international migration raises several key issues related to women's security, reproductive health and empowerment, and HIV/AIDS. However, recently,

the sex ratio declined from 3.56 in 2007 to 1.30 in 2012. The number of female overseas migrants still exceedsthe number of males, although the difference is becoming smaller.

TABLE 2-16

Remittances Inflow to Indonesia by Country: 2012

No.	Country	Number (in million IDR)	Percentage
	Asia		
1	Malaysia	2,096.72	32.85
2	Singapore	276.33	4.33
3	Brunei Darussalam	68.00	1.07
4	Hong Kong	504.97	7.91
5	Taiwan	524.39	8.22
6	South Korea	111.38	1.75
7	Japan	161.12	2.52
8	Macao	37.75	0.59
9	Others	9.63	0.15
	Sub-Total	3,790.30	59.38
	Middle East and Africa		
1	Saudi Arabia	1,785.97	27.98
2	UEA	188.35	2.95
3	Kuwait	21.16	0.33
4	Bahrain	15.89	0.25
5	Qatar	56.24	0.88
6	Oman	25.51	0.40
7	Jordania/Syiria	71.25	1.12
8	Egypt/Yemen	0.85	0.01
9	Cyprus	12.54	0.20
10	Sudan	0.26	0.00
11	Africa	12.33	0.19
12	Others	12.40	0.19
	Sub-Total	2,202.74	34.51
	USA, Australia, European		
1	USA	331.38	5.19
2	Australia	5.20	0.08
3	Netherland	5.83	0.09
4	Italy	16.64	0.26
5	German	5.61	0.09
6	United Kingdom	4.27	0.07
7	France	1.39	0.02
8	Spain	10.17	0.16
9	Others	9.27	0.15
	Sub-total	389.78	6.11
	TOTAL	**6,382.82**	**100.00**

Source: Ministry of Manpower

Indonesia should treat the experiences of Indonesians working, studying, and living abroad as an asset - a “brain gain” rather than “brain drain.” Improving protection to all citizens overseas should be prioritized. In addition, better statistics are needed to gauge Indonesian mobility overseas and promote sustainable development. The increasing and continuing trend of labor migration overseas also calls for greater international cooperation, particularly in the protection of Indonesians living overseas and for their better well-being.

It is clear that there are significant dividends to the home country if expatriates return, especially ifthey are skilled in areas that are in demand in the origin country. This population extended their knowledge and experience while overseas, and return home with a network of overseas contacts which can benefit their work at home. Literature on return migration and studies of diaspora indicate there is often a high level of interest among many expatriates to eventually return to their home countries. Returnees shouldbe able to use their talents in worthwhile jobs upon their return.

Indonesia: Becoming a Magnet for Foreigners

On the other hand, Indonesia has also become a place of destination for foreign students, workers and those seeking to settle down. One negative consequence, though small in number, is that Indonesia is receiving people doing undesired things, such as smuggling drugs and other criminal activities.

There is still a lack of information on the number of foreign nationals studying in Indonesia. However, casual observation indicates the rising interest of foreigners to study in Indonesia, using *Bahasa Indonesia*, and interacting with Indonesian students. Many of these students come from Malaysia and China, particularly at the undergraduate level. Nevertheless, unlike its neighbors, Singapore, Malaysia and Australia, Indonesia has not made international education one of the key drivers of its economic development. With rising economic integration, Indonesia should move toward attracting more international students and making international education a priority in their economic development plans moving forward.

Indonesia has been attracting an increasing number of foreign workers and investors to various parts of the country in recent years. Data from the Ministry of Manpower shows that the number of foreign workers in Indonesia rose significantly from 18, 138 in 2003 to 60, 902 in 2006 followed by a tripling within three years to reach 102, 288 in 2010, and higher still to reach 118, 177 in 2011. In addition, these foreigners send remittances to their home countriesand that amount has increased tremendously in recent years (Ananta & Arifin 2014). If the trend continues, over the next 10 years Indonesia will experience deficit remittances with outflows exceeding inflows.

As in many other countries, most foreigners tend to concentrate in the capital city. In 2001, almost 70 percent of foreigners lived in Jakarta. However, the percentage of foreigners living in Jakarta declined to around 50 percent in 2006 before increasing to about 62 percent in 2011. It is recognized thatthe declining trend in the share of foreigners working and living in Jakarta followed the implementation of regional autonomy in 2001. There has also been a change in the foreigners’ compositions by nationality, away from domination of *orang bule* (Westerners) to Asians (Ananta & Arifin 2008). Furthermore, among Asian foreigners there is a shift away from Japanese to Chinese in recent years (Ananta & Arifin 2014). The promising future of Indonesia should anticipate attracting more foreigners to work and live in Indonesia. Social cohesion should be envisioned and potential conflict should be prevented within the framework of economic justice.

3

Three Dimensions of Sustainable Development

3.1. ECONOMIC DIMENSION

3.1.1 Promote Growth for Sustainable Consumption and Production

"

Around the world many of the basic resources on which future generations will depend for their survival and well-being are depleted and environmental degradation is intensifying, driven by unsustainable patterns of production and consumption, unprecedented growth in population, widespread and persistent poverty, and social and economic inequality. Ecological problems, such as global climate change, largely driven by unsustainable patterns of production and consumption, are adding to the threats of the well-being of future generation

"

(UN Population Division, Department of Economic and Social Affairs & UNFPA, 1994, Preamble of ICPD Programme of Action)

This view was expressed in 1994 as part of the world population conference, "International Conference on Population and Development" in Cairo. Until now this remains a global challenge and one that Indonesia shares.

The future development framework should consider challengesassociated with the predicted peak inthe human population to 9-10 billion in 2050 and the need to manage the world's production and consumption patterns in more sustainable and equitable ways. Changes in behaviour are needed on a global scale to increase efficiency of environmental assets and resources. This global challenge opens the door for a new and truly universal agenda.

Sustainable consumption and production levels are considered those where consumption and production today are done without sacrificing future levels. Two criticalaspects of this sustainability include: 1) Life-course financial sustainability and intergenerational financing; 2)Sustainability of the environment, particularly pollution in air, water and soil, as well as degradation of natural resources. Unsustainable production and consumption can be seen from the rising consumerism and economic growth in the world since the 1990's. This consumption-driven GDP growth is often fuelled by a credit-led growth model where expansion of credit is largely responsible for growth. People are encouraged to borrow and spend more withlow interest rates and high inflation rates that discourage saving. However, as argued in Jackson (2011), this debt-driven materialistic consumption has destabilized the world's macro-economy and led to a global economic crisis. Instead, Jackson recommends an era of financial and fiscal prudence. One suggestion to reduce over-consumption is to regulate commercial media. For example, businesses should not target commercial advertisements to children under the age of 12.

In Indonesia, household consumption accounted for almost 56% of GDP in 2013 (Badan Pusat Statistik 2014) while investment was around 32% and exports stood at 24%.Household consumption was the largest contributor of GDP growth, at 3 percent of 6.2 percent GDP growth in 2013. In addition, consumption credit was the second largest type of credit compared to investment (ranked 1st) and working-capital credit (ranked 3rd). Before Indonesia's benchmark interest rate rose to 7.5 percent in the period 2013-2014, consumption credit growth had grown significantly.

The current credit-led development and growth paradigm that many countries follow, including Indonesia, should be re-examined to ensure people do not live beyond their financial capability or live from speculation. Financial literacy can be promoted to increase awareness of spending and consumption behaviorsandencourage people to live financially sustainable lifestyles.

Indonesia is following a similar trajectory as the BRIC (Brazil, Russia, India, and China) nations with a rising middle-class fueled by the rising consumption patterns of its economy. As confirmed by Matthew (2012), the consumption of the middle-class in BRIC countries has expanded with extraordinary speed towarda preference for motorcycles, cars, large houses, meat, and other commodities with a large energy footprint.[12]By examining the changing consumption trends, Indonesia can increase their awareness and analyze the impact on their people, economy and natural resources.

Life-cycle Consumption and Production Pattern

Consumption and production decisions depend on many things includingthe age of the population. People of different ages are likely to consume different goods and services. As such, the patterns of consumption and production usually also vary by age.One clear example is the different consumption needs of children as compared to older persons. At the same time, people of different ages tend to have different abilities and experiences to work, or produce. People are lifelong consumers, regardless of whether or not they produce, thus the burden of production usually falls on the working age population. Differences in consumption and production patterns also result in differentstrategies to finance consumption, including who is able to finance the consumption.Therefore, a changing age structure of the population can hold important implicationsfor the patterns and financing of consumption and production.

Mason and Lee (2011) discovered that until the first decade of the 21st century the population age structures of many countries had been favorable for their economic development. These conditions included a concentration of the working age population who were able to produce and finance the younger and older persons. This trend may continue for some countries in Asia and most countries in Africa. However, some countries who used to enjoy a large concentration of working age population,such as countries in the West, East Asia, and Latin America, have shown a different trend with the percentage of the working population soon declining or having already declined because of the rising percentage of the older population.

As discussed in Chapter 2, Indonesia's population is also undergoing profound changes in its age structure as the country moves through a demographic transition from high to low fertility and mortality rates. In the short run, Indonesia will have a limited window to benefit from the rising working age population that can increase

12 Footprint is described as the energy needed to produce, distribute, and operate goods and services.

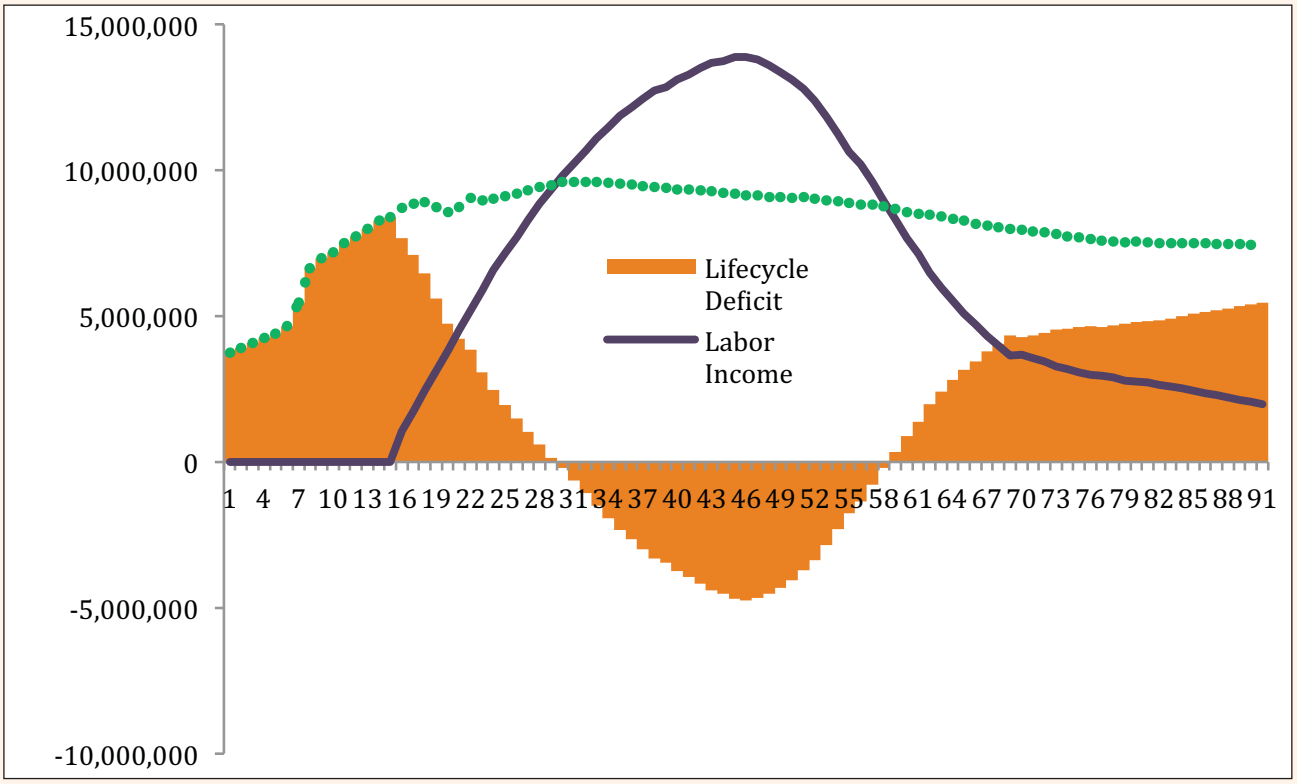
productivity and accelerate economic growth. In the long run, Indonesia will follow the trend in the West, East Asia, Thailand and Latin America where a declining percentage of the working age population is followed bya rising percentage of older persons.

Therefore, the question of who will finance the rising number and percentage of older persons becomes very important. As elaborated in Mason and Lee (2011), the deficit can be financed through sharing and/or saving throughoutan individual's lifecycle. Sharing, ora transfer payment from others, including family, society, or government, is one way to finance consumption. Transfer payments can take various forms such as aid, scholarships,and subsidies. Another way to finance consumption is through saving. Saving occurs when production exceeds consumption and today's savings can be used to finance consumption during the later ages.

How do Indonesians consume and produce? Patterns of per capita consumption and production showhow Indonesians consumed and produced in 2005 over their life course (Figure 3.1)(Maliki 2011).The figure shows per capita consumption increasing steadily during childhood and reaching its peak in late adolescence (17 years old) due to expenditure on education. Once aged 28, per capita consumption begins to decline slightly and stabilizes throughout the remainder of the life course. Meanwhile, Indonesians only begin producing at the age of 15 and remain producing until old (60 years old and over). However, labor income among the elderly is relatively lower than that of the productive age population.

FIGURE 3-1

The Age-Specific Labor Income, Consumption and LifecycleDeficit:Indonesia, 2005



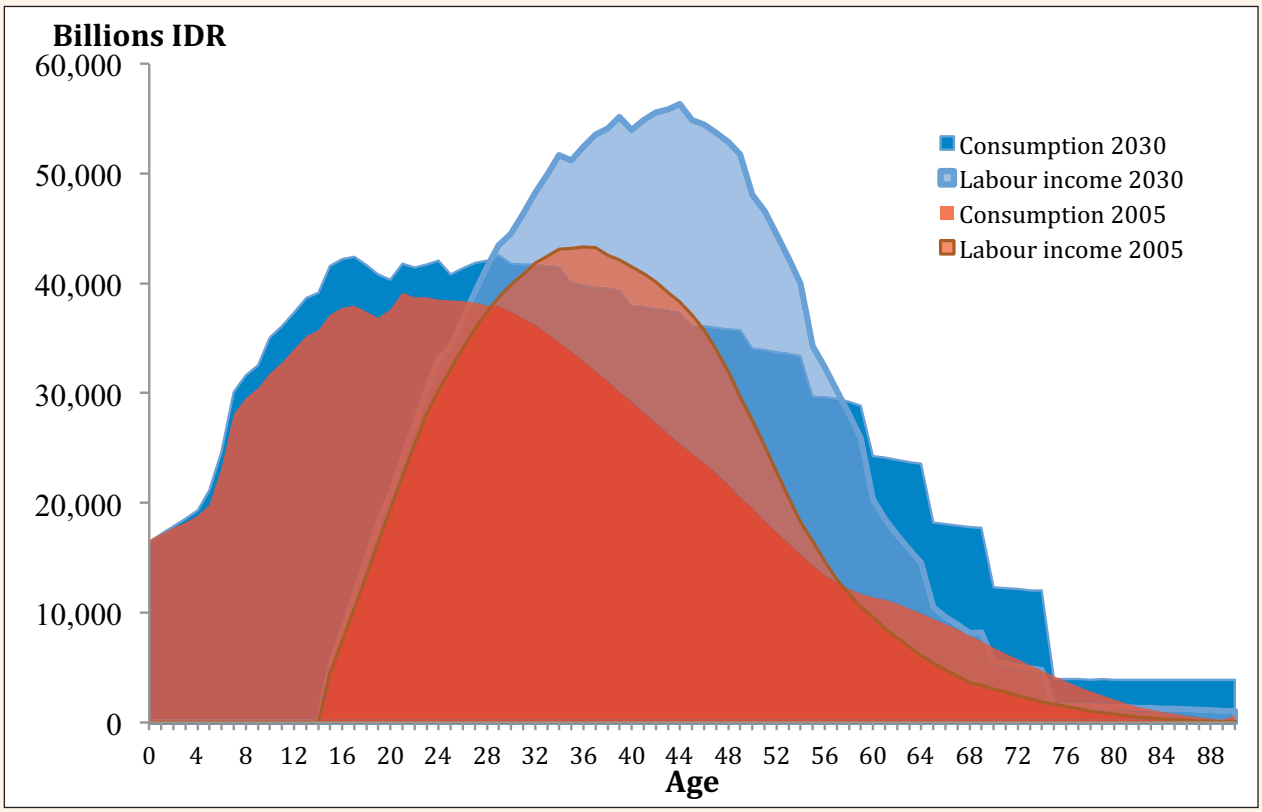
Source: Drawn from Maliki (2011)

As shown in Figure 3.1, Indonesians until 28 years old consumed more than they produced resulting in a deficit, as reflected in the darkened area among the younger persons. Similarly, after 58 years old, Indonesians consumed more than they produced also resulting in a deficit, as presented in the darkened areas after age 58. However,between ages 28 and 58, Indonesians produced more than they consumed thus creating a surplus as indicated by the darkened area between the ages 28 and 58. The only age–interval that created a surplus was the 28-58 year olds. Furthermore, the peak of labor income and largest surplus were generated among the working age population at the age of 45. However, the surplus generated by the working population (aged 28-58) was smaller than the deficit from the population under 28 and over 58. In total, Indonesia experienced a net deficit whereby consumption exceeded production.

Indonesians financed their net deficit through saving and sharing. According to Maliki (2011), those in school received transfer payments from the government for their education. The spending on education, including both in-kind services and cash transfers for education, was greater than the spendingon health of younger persons. Another large transfer payment was given outto poor households, especially through cash transfers. On the other hand, those aged 20-64 experienced negative net public transfers implying that transfer payments from the government were smaller than their taxes. Older persons relied mostly on labor income and their own assets, as pension was limited to government workers. With the deficit in consumption and production patterns, alongside relatively insufficient

FIGURE 3-2

The Age-Specific Labor Income, Consumption and LifecycleDeficit: Indonesia, 2005



Source: The data in 2005 is drawn from Maliki (2011) and the 2030 data is the authors' simulation based on Maliki (2011).

public transfers, the government should pay more attention to helping the poor households, especially poor older persons, who may havelittle to no assets and are unable to work.

Moving forward, Indonesians should learn to make a lifecourse financial plan for themselves, especially during their productive ages.By 2030, the working age population will account for almost half of the Indonesian population and it is important for them to be able to manage their income throughout their productive ages by spending it wisely and making investments to prepare for their retirement (Maliki 2011).

As seen in Figure 3.2, we simulated life-cycle financing in 2030 when the dependency ratio will be its lowest at 46.9 (Bappenas, BPS & UNFPA 2013) and assuming the same patterns of consumption and production as those in 2005. This simulation uses the different age-structure of Indonesia's population in 2030[13] to analyze the impacts of a changing age-structure population on the economy.

As seen in Figure 3.2,the simulation shows a net deficit remains in 2030 such that total aggregate consumption will still exceed the total aggregate production assuming patterns remain the same as in 2005. However, saving will not be sufficient to fill in the deficit, thussharing or public transfer payments will still be necessary in 2030.

However, history doesn't have to repeat itself.Raising productivity and the health status of the working age population is critical to reducing the deficit and creating a net surplus. Better spending on the health and education of younger children will also result in a better labor force, and in turn, generate a larger surplus. Additionally, to reduce dependency on public transfer payments, we can continue promoting and implementing active aging programs to help the elderlylive healthier, independent and productive lives, and hence be better able to finance their own consumption. A more healthy and independent older populationalso reduces the cost of taking care of older persons.

Impact of Dependent Population on GDP

Looking further at the impact of age structure on the economy, this sub-section displays a regression analysis to test the impact of the number of young and old dependent populations on GDP, relative to that of the productive age population. Using 2010 data, Table 3.1 demonstrates the regression results thatdo not reject the hypothesis of the life cycle approach in consumption and production, where the young and old are the primary consumers but not producers. The dependent population, the young (below 15) and the old(60 and above), are associated with smaller GDP. In other words, the larger the number of young dependent population or old dependent population, the smaller the GDP. On the other hand, the productive population (15-59 years old) is positively associated with GDP suggesting the higher the number of productive population, the higher the GDP.

Given the impact of the dependent population on GDP, we can prevent an increasing number of younger persons in the futureby minimizing the desired number of children and raising contraceptive use. However, we must also be careful in minimizing the number of younger persons since it may reduce the future number of the productive population, an age group who have a postive impact on the economy.Increasing the number of older persons also has a negative impact on

13 The age-structure of the population in 2030 follows the projection by the Bappenas, BPS and UNFPA (2013).

GDP as shown in Table 3.1. However, the negative impact can be reduced by keeping older persons active in the economy. The role of the government in designing and implementing active aging programs is essential to make older persons healthier, more independent, and more productive. Active aging helps reduce the burden of the elderly on government and society while helping to minimize health expenditures for older persons.

TABLE 3-1

OLS Regression Results for the Impact of Age Structure of Population on Total GDP: Indonesia, 2010

Variable B	Unstandardized Coefficients		t	Sig.
	Std. Error			
(Constant)	36088.510	22391.479	1.612	0.118
Pop 15-59	225.440	35.654	6.323	0.000
Pop 60+	-463.883	91.233	-5.085	0.000
Pop 0-14	-321.315	64.302	-4.997	0.000

Note : Dependent Variable is total GDP in millions IDR
Source : Authors' calculation.

Pattern of Inter-Generational Transfer

A life cycle deficit reflects the difference between consumption and production and suggests age reallocations are needed, such as asset reallocations and net transfers. When a population is aging, the old dependency ratio is expected to rise resulting in a corresponding larger transfer amount from productive age persons to older persons. The National Transfer Accounts (NTA) divide transfers by age into public and private, as well as, asset reallocations by age. Table 3.2displays the composition of the aggregate life-cycle deficit that is derived from the NTA data by age group (Maliki 2011).

In regards to older persons, Table 3.2 shows the net transfer to older persons is negative (last column, seventh row) with the amount of public transfer received smaller than the private transfer. This data indicates a trend of older persons, especially wealthy older persons, sending private transfers to young persons. In addition, the net asset-based reallocations of older persons (178,637,790) were much larger than that of the working age population 15-59 (107,845,227). The private asset reallocation among older persons was also larger than the public allocation.

This data suggests that old parents/persons can be generous. However, this parental generosity does not necessarilycorrespond to reciprocal support when it is needed, thus leaving many older people vulnerable toward the end of their lives. This finding is confirmed in other studies, as found by Kreager and Schroider-Butterfill (2008),where villages showed variation in family ties, particularly in the heterogeneity of support flows - balanced, upward, and downward. Meanwhile, Cameron and Clark (2005) examined factors in the decision of older persons to join or stay in the laborforce, includingfactors such as co-residence with children and financial transfers from children. Using data from Indonesia, they found weak evidence that support from children was a substitute for the elderly parents need to work. The policy implications of these findings are plenty, including the need to enhance and improve the welfare of elderly Indonesians.

TABLE 3-2

Aggregate Controls for NTA by Age Group: Indonesia, 2005 (in billion rupiah)

Type	Age Group		
	0-14	15-59	60+
Lifecycle Deficit	91,238,403	-32,454,537	134,123,635
Consumption	91,238,403	411,127,057	241,536,507
Public Consumption	22,713,115	34,707,305	25,772,826
Private Consumption	68,525,288	376,419,753	215,763,681
Labor Income	0	443,581,594	107,412,873
Reallocations	91,238,403	-32,454,537	134,123,635
Transfers	86,933,698	-140,299,763	-44,514,155
Public Transfers	18,409,357	-26,767,830	2,592,861
Private Transfers	68,524,341	-113,531,933	-47,107,017
Asset-based Reallocations	4,304,705	107,845,227	178,637,790
Public	4,035,608	65,309,449	25,049,107
Private	269,097	42,535,778	153,588,683

Source: Calculated from Maliki (2011)

3.1.2 Promote Decent Jobs

Concept of Decent Jobs

Decent jobs are concerned with full and productive employment, rights at work, social protection, and social promotion between workers and employers. In Indonesia, eleven measurements of decent work have been suggested by the International Labor Organization (ILO) including: employment opportunities; adequate earning and productive work; decent hours; combining work, family, and personal life; work that should be abolished; stability and security at work; equal opportunity and treatment in employment; safe work environment; social security; social dialogue between employers and workers (International Labor Organization 2011).

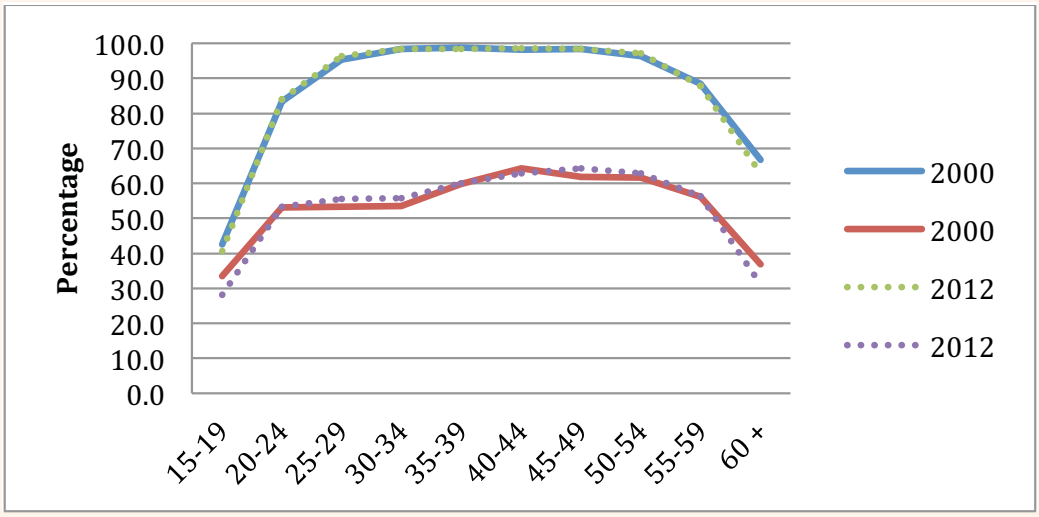
The discourse on decent jobs in Indonesia must also pay attention to the three mega demographic trends in Indonesia. In particular, the trend of a continuous increase in the total population and working age population (25 to 59 years old). The working age population in Indonesia will increase from 110 million in 2010 to more than 140 million, or almost half of the total population, by 2030.This underscores the need for the creation of decent jobs to match the increasing number of working age population. However, similar to other developing countries, Indonesia still faces a wide skills gap in which there is a mismatch betweeen skills required by employers and those possesed by employees. As such, the government is needed to create a policy environment that supports decent job creation and continuously improves the skills of workers. In the longer term, decent jobs will need to be provided for older workers as the current working age population ages.Considering the trend of rising mobility among the population, it is also important to consider decent jobs for people who are on the move.

Characteristics of Indonesia's Labor Force

The current profile of Indonesia's labor force is still dominated by a large number of low educated workers. Lack of social protection and small pensions forces people to work even at older ages. Figure 3.3 shows labor force participation rate by age and sex. According to this figure, about 40 percent of young males already entered the labor market reflecting a high school dropout rate. In addition, about 70 percent of older persons (age 60-64 years) are still working or looking for work. The rate for the female labor force is lower than the male reflecting the existence of a patriarchal system where men are responsible to earn a living. In addition, women usually display a preference in whether to allocate their time to the labor market or to stay at home taking care of their families. Preference is also seen in the choice of work. For example, women tend to avoid working in mining, transportation, etc. although there is a tendency for women to engage in work that is usually dominated by men. Evidence also indicates that discrimination of women in the workplace still persists, whereby women with the same education and job as men still receive lower pay. Interestingly, this pattern of labor force participation hasremained consistent for the last ten years.

FIGURE 3-3

Labor Force Participation Rate by Age and Sex: Indonesia, 2000-2012

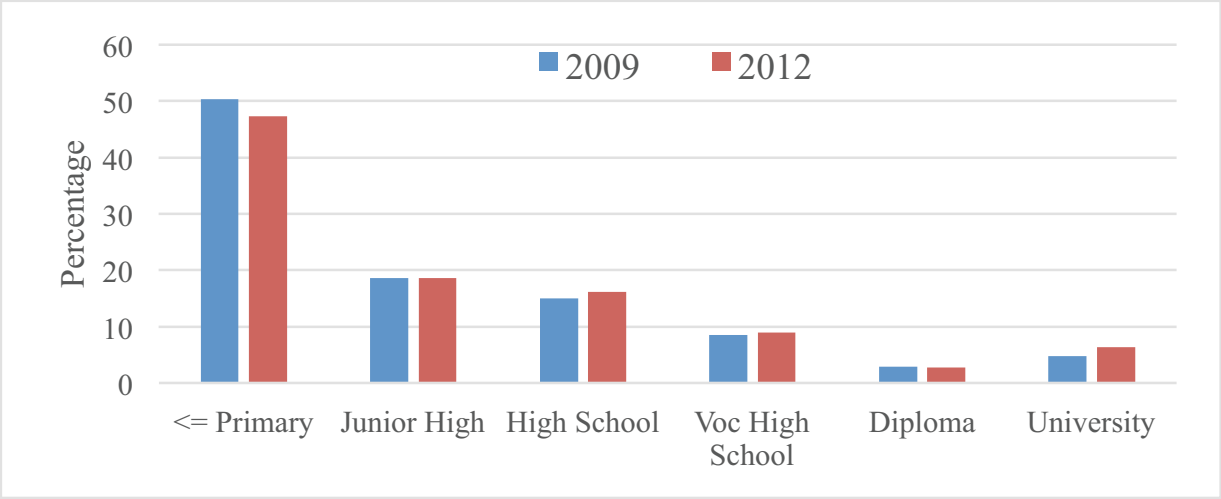


Source: Census 2000 and National Labor Force Survey (Sakernas) 2012

Generally, Figure 3.4supports the argument of the low educational attainment of Indonesian workers. Yet this figure also reflects a recent increase in educational attainment, particularly among younger workers (UNFPA 2014).

FIGURE 3-4

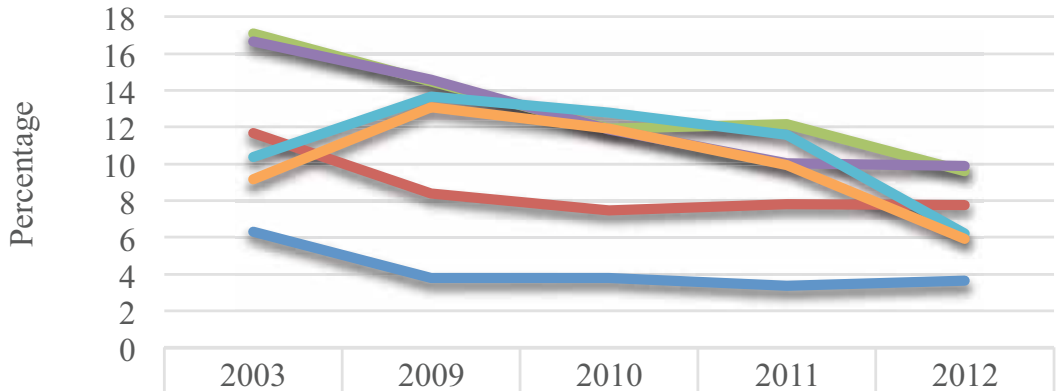
Education of Indonesian Workers, Sakernas 2009, 2012



Source: Adioetomo and Indrayanti (forthcoming)

FIGURE 3-5

Trend in Unemployment Rate by Education: Indonesia, 2003 - 2012



	2003	2009	2010	2011	2012
<= Primary	6.3	3.8	3.8	3.4	3.6
Junior High	11.7	8.4	7.5	7.8	7.8
High School	17.1	14.5	11.9	12.2	9.6
Voc High Sch	16.6	14.6	11.9	10.0	9.9
Diploma	10.4	13.7	12.8	11.6	6.2
University	9.1	13.1	11.9	10.0	5.9

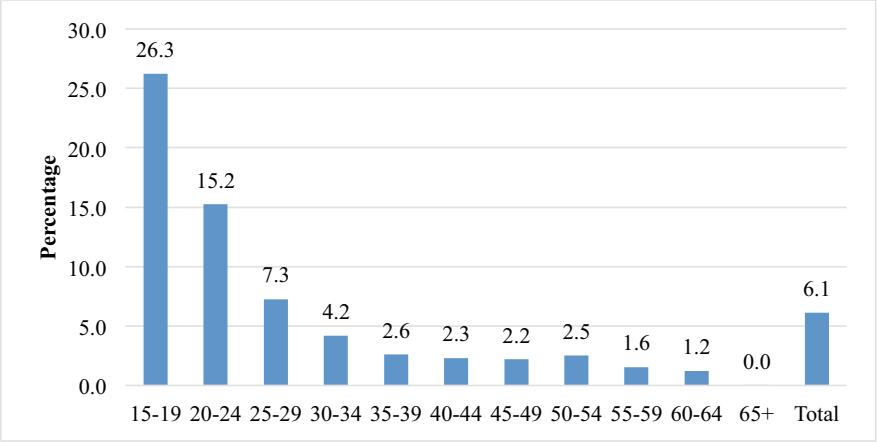
Source: Adioetomo and Indrayanti (forthcoming) calculated from Sakernas 2012

Furthermore, Figure 3.5 shows the decline in unemployment ratesat each education level, however, the rate still remains quite high. The highest unemployment rate was at the general and vocational high school levels, 9.6 and 9.9 percent, respectively. In this case, the labor market could not absorb these high school graduates most likely due to a wide skills gap or because their skills did not match those required by employers (i.e., mismatch unemployment).

One explanation for the low education levels of Indonesian workers are that a high percentage of young people are forced to leave school and enter the labor market (Figure 3.6). As a result, they are poorly educated and unskilled when joining a labor market that increasingly demandsskilled workers. Most of these young people are not absorbed in the formal job market and end up working in the informal sector.

FIGURE 3-6

Percentage of Unemployed People by Age, Sakernas 2012



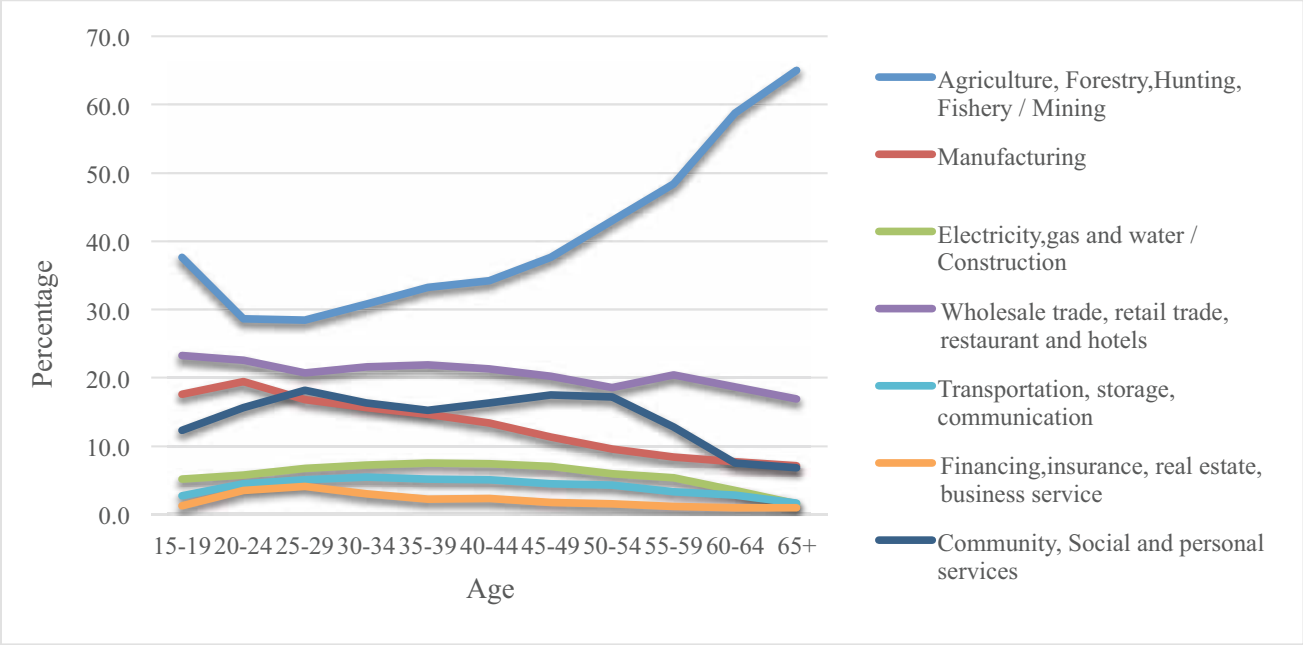
Source: Adioetomo and Indrayanti (forthcoming)

This situation needs urgent intervention. For those already in the labor market, efforts are needed to bring them back to school. Alternatively, additional training or internship programs can be provided to improve their skill levels. Policiesare neededsmoothen out the transition from school to work and equip these young people with the skills they need to ensure a decent job and decent living.

Today, in Indonesia, the agricultural sector is the highest contributor to employment. The financial sector contributes higher to the overall GDP, but the percentage of workers employed bythis sector is much smaller. As seen in Figure 3.7, theagricultural sector employs people of all ages, but employment is typically dominated by older persons. However, the salary of those working in agriculture is relatively lower than those working in other sectors. It should also be noted that despite high levels of employment in this sector, it is also the lowest in terms of productivity and salary.

FIGURE 3-7

Employment by Industry and Age: Indonesia, 2012



Source: Adioetomo and Indrayanti (forthcoming), calculated from Sakernas 2012

In summary, the status of Indonesian workers needs to be improved. Alternative interventions should focus on young people already in the labor market by providing them with additional training and internships. Policy interventionsfacilitiating the transition from school to work have to be prioritized. In addition, children who enter the labor market should be prepared and equipped with a quality education.

3.2. SOCIAL DIMENSION

This section discusses eradication of capability deprivation, which includes but is not limted to, eradicating poverty, preventing and reducing dysfunctional ability, and reducing inequality. Accurate information on those experiencing capability deprivation, and their distribution, is imperative in designing and implementing policies that support sustainable development. Limited financial and human resources can be prioritized to regions with the highest poverty rates, or number of poor; largest number of people with dysfunctional ability; and highest inequality. Efforts toward eradicating capability deprivation will contribute tothe achievement of sustainable development. This section also examines human capital development (i.e. education and health) as one of building blocks of sustainable development. Better educated and healthy people are also the goals of sustainable development.

3.2.1 Eradication of Capability Deprivation

As discussed in Chapter 1, the concept of capability deprivation is wider than poverty alone.Capability deprivation, in itself, should be a target in achieving sustainable development by 2030. This study sets out a clear path for eradicating capability

deprivation by considering population dynamics.Using a population dynamics lens, we can address issues of inequality that may disrupt social cohesion.

As argued by Sen (1999), the concept of capability deprivation emphasizes social justice and considers an individual's capability to lead a particular life. Capability deprivation consists of poverty (income and non-income) and disability, as well as inequality in capability. As such, poverty must be viewed as the deprivation of basic capability rather than merely in terms of low income as derived from a certain threshold of income or poverty line.

People with disabilities can be a burden for the society and the economy. Furthermore, disability reduces the welfare of the people with disabilities and theimmediate family. Fortunately, many disabilities can be avoided either by preventing or treating the disabilities. Therefore, more efforts must be made to reduce the number and percentage of people with disabilities, regardless of age and gender,by treating or removing the physical dysfunctions. Beside prevention efforts, facilities for the disabled are also needed to increase theiractivity levels and independence, and potentially contribute to their society and economy.

Eradication of Poverty

Goals have been set by the High Level Panel of Eminent Persons (HLPEP) report[14] that after 2015 we should move from reducing to ending extreme poverty in all its forms. Low income is clearly one of the major causes of poverty, as well as, the principal reason for an individual to suffer from capability deprivation. Thus, insufficient income is a strong predisposing condition for an impoverished life. The physical characteristics of poor households include living in smaller houses with each person living in less than 8 metersof floor space; dirt floors;non-brick walls;and a lack access to electricity and adequate sanitation and clean drinking water. Household members among the poor are oftenfemale-headed households and tend to be more vulnerable to poverty than male-headed households. Given the gendered implications of poverty, eradication efforts should adopt a gender perspective.

To date, Indonesia has made great progress in alleviating poverty. As one of the world's largest emerging economies, Indonesia has experienced rapid economic growth and a substantial reduction of poverty over the past three decades, particularly prior to the1997-1998 Asian Financial Crisis. After the crisis, Indonesia entered a new development phase that saw the fall of the Suharto government and the introduction of newlydecentralized governance system. However, poverty alleviation was interrupted in 2006 due to a policy implemented a year earlier that reduced fuel subsidies and pushed the inflation rate up to 17.1 percent in 2005.

The decline in the poverty rate resumed in 2007 reaching 16.6 percent. As seen in Table 3.3, the poverty rate has continued to decline since 2007 finally reaching 11.5 percent in 2013. Surprisingly, the 2008/2009 global financial recession did not even stop the decline in poverty rates in Indonesia. This is possibly due to better crisis preparedness and lessons learned after the 1997/1998 crisis. For example, during the 2008/2009 crisis, a fiscal stimulus was injected to ease the pressure of the crisis on people's purchasing power and to manage the inflation rate. These government efforts ending up benefiting the population, in general.

Table 3.3 also highlights large regional variation in the poverty rate in 2007, ranging from as low as 4.6 percent in Jakarta to as high as 40.78 percent in Papua. However,

14 The High Level Panel of Eminent Persons (HLPEP) report, "A New Global Partnership: Eradicate Poverty and Transform Economies through Sustainable Development".

all provinces experienced a decline in the poverty rate from 2007–2013. In 2013, the regional variation declined as the gap between the lowest and highest rate narrowed with 3.7 percent as the lowest in Jakarta and 31.5 percent as the highest rate in Papua.

TABLE 3-3

Poverty Rate by Province: 2007-2013

Province	2007	2008	2009	2010	2011	2012	2013
Aceh	26.65	23.53	21.80	20.98	19.57	18.58	17.72
North Sumatera	13.90	12.55	11.51	11.31	11.33	10.41	10.39
West Sumatera	11.90	10.67	9.54	9.50	9.04	8.00	7.56
Riau	11.20	10.63	9.48	8.65	8.47	8.05	8.42
Jambi	10.27	9.32	8.77	8.34	8.65	8.28	8.42
South Sumatera	19.15	17.73	16.28	15.47	14.24	13.48	14.06
Bengkulu	22.13	20.64	18.59	18.30	17.50	17.51	17.75
Lampung	22.19	20.98	20.22	18.94	16.93	15.65	14.39
Bangka Belitung	9.54	8.58	7.46	6.51	5.75	5.37	5.25
Riau Archipelago	10.30	9.18	8.27	8.05	7.40	6.83	6.35
Jakarta	4.61	4.29	3.62	3.48	3.75	3.70	3.72
West Java	13.55	13.01	11.96	11.27	10.65	9.89	9.61
Central Java	20.43	19.23	17.72	16.56	15.76	14.98	14.44
Yogyakarta	18.99	18.32	17.23	16.83	16.08	15.88	15.03
East Java	19.98	18.51	16.68	15.26	14.23	13.08	12.73
Banten	9.07	8.15	7.64	7.16	6.32	5.71	5.89
Bali	6.63	6.17	5.13	4.88	4.20	3.95	4.49
West Nusa Tenggara	24.99	23.81	22.78	21.55	19.73	18.02	17.25
East Nusa Tenggara	27.51	25.65	23.31	23.03	21.23	20.41	20.24
West Kalimantan	12.91	11.07	9.30	9.02	8.60	7.96	8.74
Central Kalimantan	9.38	8.71	7.02	6.77	6.56	6.19	6.23
South Kalimantan	7.01	6.48	5.12	5.21	5.29	5.01	4.76
East Kalimantan	11.04	9.51	7.73	7.66	6.77	6.38	6.38
North Sulawesi	11.42	10.10	9.79	9.10	8.51	7.64	8.50
Central Sulawesi	22.42	20.75	18.98	18.07	15.83	14.94	14.32
South Sulawesi	14.11	13.34	12.31	11.60	10.29	9.82	10.32
Southeast Sulawesi	21.33	19.53	18.93	17.05	14.56	13.06	13.73
Gorontalo	27.35	24.88	25.01	23.19	18.75	17.22	18.01
West Sulawesi	19.03	16.73	15.29	13.58	13.89	13.01	12.23
Maluku	31.14	29.66	28.23	27.74	23.00	20.76	19.27
North Maluku	11.97	11.28	10.36	9.42	9.18	8.06	7.64
West Papua	39.31	35.12	35.71	34.88	31.92	27.04	27.14
Papua	40.78	37.08	37.53	36.80	31.98	30.66	31.53
INDONESIA	16.58	15.42	14.15	13.33	12.49	11.66	11.47

Source: Badan Pusat Statistik website (http://www.bps.go .id)
Note: Data for 2012 and 2013 refer to September.

As shown in the above table, the poverty rates in Eastern Indonesia are relatively high. Only the provinces of North Maluku and North Sulawesi had a one-digit poverty rate with the rest of the provinces having a double-digit poverty rate. In Western Indonesia, several provinces had double-digit poverty rates including provinces of Central Java, East Java and Yogyakarta. In the Sumatra, high poverty rates were seen in the northern tip provinces of Aceh and North Sumatra and the southern tip of Bengkulu, South Sumatra and Lampung. Overall, Table 3.3 shows a promising trend in the continuous decline of the number of poor in Indonesia from 37.2 million in 2007 to 31.0 million in 2010, and further down to 28.1 million in 2013.

Nevertheless, the number of poor in Indonesia is still large and poverty reduction goals to achieve zero poverty by 2030 will continue to be a serious challenge. However, the large number of poor is partly due to Indonesia's large population size. In general, a large population tends to be large across the board in terms of employment, consumers, and producers. Therefore, it becomes more important to focus on the percentage of the poor.

Poverty measurement choices influence the level of poverty reduction. As such, a means-tested and targeted poverty alleviation program perhaps remains a key policy pillar in Indonesia.However, such programs often fail to reach those most in need because of ineffectivetargeting (Ananta and Arifin 2012; Miranti et al. 2013). Dealing with the inefficiencies and "leakage" in social assistance continues to be a keypolicy challenge.

Furthermore, unsustainable environmental practices affect the livelihood of people. The poor and disadvantaged suffer most from environmental degradation. Every week from January-March 2014, during the writing of this book, the Indonesian media reports catastrophes from floods, volcanic eruptions, and forest fires that ruin the lives of poor Indonesians; lives that already face major disadvantages. However, the effects of environmental degradation are escalating and being felt by even the non-poor elites who live in comfortable conditions.

Reduction in Inequality

Indonesia is attracting more attention from foreign investors worldwide due to its sound macroeconomic policies, resilience to the global financial crisis, and strong consumer markets.Between 2000 and 2010, the Indonesian economy grew by 5.2 percent per year. Alongside this economic growth, the absolute poverty rates have declined yet consumption inequality has increased. In Indonesia, high economic growth was accompanied by increasing inequality.

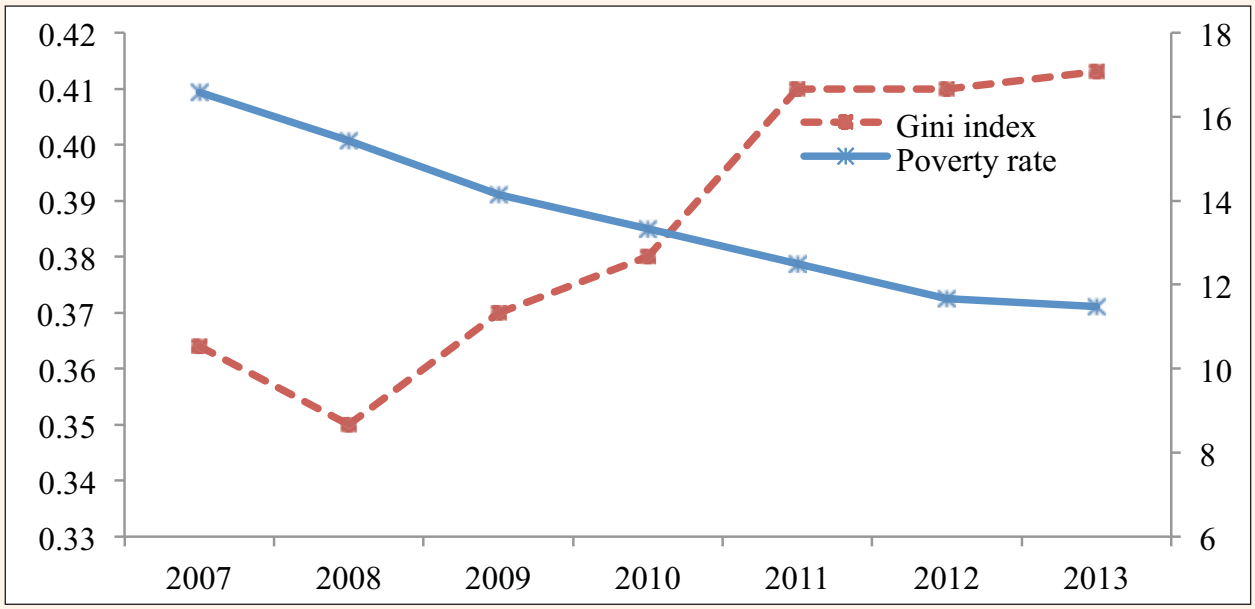
One measure of such inequality is the Gini index which measures income inequality on a scale from 0 to 1. The value of 0 represents total equality, whereby everyone has the same income (i.e., no inequality), whereas the value of 1 represents maximum inequality, or a situation where one person owns all of the nation's wealth.According to the Badan Pusat Statistik (Central Beaureu of Statistics), the Gini statistic helps gauge the degree to which national policies need to be balanced for wealth distribution purposes. The United Nations uses 0.4 as its warning threshold and any number crossing thatthreshold signals a large income gap in the country.

It has been evident that the economic gains are unevenly distributed with economic development bringing a rise in income inequality. Figure 3.8 presents the poverty rate and inequality trends measured by the Gini index between 2007 and 2013. This figure exhibits a distinct pattern in which a significant decline in poverty rate is

accompanied by the exponentially increasing inequality shown by an increasing Gini index that surpassed the 0.4 "warning" threshold in 2011. This figure illustrates the serious challenges ahead for sustainable and inclusive development in Indonesia.

FIGURE 3-8

Gini Index and Poverty Rate in Indonesia: 2007-2013



Source: Central Bureau of Statistics

Worsening income inequality in Indonesia is also evident from the distribution of expenditure share. Central Bureau of Statistics data shows that people in the bottom 40 percent of expenditure enjoyed only 19.1 percent total expenditure in 2007 and this figure increased only slightly to 19.6 percent in 2008. After 2008, the share of the bottom 40 percent continuously declined to 16.8 percent in March 2013. In contrast, people at the top 20 percent enjoyed a much larger share of total expenditure at around 44.8 percent in 2007. The share of the top 20 percent has continued to rise and reached almost 50 percent (precisely, 49.0 percent) in 2013. This illustrates the widening of the gap between poor and rich, thus revealing a situation of worsening income inequality.

Income polarization can lead to the emergence, or disappearance, of particular groups in the income distribution. Income polarization is expected to increase when the gap between income groups widens. In addition, income polarization goes up when the income gap within the sameincome group becomesmore cohesive, or smaller. An increase in polarization may indicate the disappearance of a middle class, asthose previously in the middle of the income distribution "disappear" and move to the top and bottom of the distribution. A study looking at country data by Esteban and Ray (2011) found that a highly polarized society is also positively associated with higher conflict intensity. Therefore, it is imperative to closely examine the level and changes of income polarization in Indonesia.

Pratama (2014) observes several trends on income polarization in Indonesia. Primarily, results showed all regions experienced a significant increase in

polarization, including: Western and Eastern Indonesia; urban and rural areas; and natural resource-rich and non-natural resource-rich regions. Western and Eastern Indonesia have experienced an increasing trend in polarization since 2000 with Eastern Indonesia having a higher increase than Western Indonesia. Meanwhile, urban society has become more polarized than rural regions. Urban polarization has risen higher than rural polarization despite the fact that urban and rural polarization have both shown an increasing trend. Moreover, both resource-rich provinces, such as Riau, Aceh, and East Kalimantan, and non-resource rich regions show a substantial increase in polarization since 2000. However, the increase in polarization of natural resource-rich regions is much higher than that of non-natural resource-rich areas.

A significant increase in national and regional polarization is mainly due to the fact that the rich have experienced substantially higher increases in their income than the poor. Growth in average income per capita between 2008 and 2012 was around 4.8 percent (Widianto 2013). Those on top of the income distribution experienced per capita growth more than the national average, ranging from 4.9 to 8.5 percent. On the contrary, the bottom 40 percent of people with the lowest income had only 2 percent per capita growth; a figure way below the national average. Furthermore, polarization is further exacerbated by a widening inequality in opportunities and access to basic services within and between regions in health, education, infrastructure, sanitation, and electricity.

One strategy to reduce income polarization is to improve the labor sector by expanding formal employment, increasing labor productivity and encouraging the labor movement toward labor-intensive sectors such as manufacturing and the high-end service sector. Indonesia is currently experiencing deindustrialization as the share of manufacturing in GDPhas been decliningsince 2001from 29 percent to 23.6 percent in 2014, according to BPS. Therefore, future policies should encourage the movement of labor from low to high productivity sectors, such as manufacturing and high-end services, and industrialization conditions should be sustained. Relevant policiesinclude the development of hard infrastructure, flexible labor market policies and the improvement of“soft” infrastructure, such as human capital.

Spatial Inequality (Between Urban and Rural, Among Provinces)

Urban versus rural income inequality has become central to the debate on increasingnational income inequality. Indonesia provides a case whereby inequality is more severe in urban areas than in rural areas. At the same time, industrialization strategies tend to be urban-biased. Rising urbanization in the future will be associated with a widening income gap between the rich and the poor. In urban areas, the Gini index increased from 0.32 in 2007 to 0.42 in 2011, while in rural areas it increased from 0.27 to 0.34, in the respective years. In other words, the Gini index is increasing in both areas, but also the differences in the Gini index between the two areas is widening.

Table 3.4 shows variation in the Gini index among provinces. In 2007, Papua was the only province with an index above 0.4, or “warning” threshold level, while the other provinces had indices ranging between 0.388 in the province of Gorontalo and 0.259 in the province of Bangka Belitung. In 2013, the pattern had changed with more provinces passing the 0.4 threshold indicating more provinces are suffering from a worsening in income inequality.

TABLE 3-4

Gini Ratio by Province Ordered by the 2013 Data: Indonesia, 2007 -2013

Province	2007	2008	2009	2010	2011	2012	2013
Papua	0.412	0.400	0.380	0.410	0.420	0.440	0.442
East Java	0.366	0.360	0.380	0.410	0.400	0.430	0.439
Gorontalo	0.388	0.340	0.350	0.430	0.460	0.440	0.437
Jakarta	0.336	0.330	0.360	0.360	0.440	0.420	0.433
West Papua	0.299	0.310	0.350	0.380	0.400	0.430	0.431
South Sulawesi	0.370	0.360	0.390	0.400	0.410	0.410	0.429
Southeast Sulawesi	0.353	0.330	0.360	0.420	0.410	0.400	0.426
North Sulawesi	0.324	0.280	0.310	0.370	0.390	0.430	0.422
West Java	0.344	0.350	0.360	0.360	0.410	0.410	0.411
Central Sulawesi	0.320	0.330	0.340	0.370	0.380	0.400	0.407
Bali	0.333	0.300	0.310	0.370	0.410	0.430	0.403
Central Java	0.365	0.340	0.370	0.420	0.400	0.390	0.399
West Kalimantan	0.309	0.310	0.320	0.370	0.400	0.380	0.396
Yogyakarta	0.326	0.310	0.320	0.340	0.380	0.380	0.387
Bengkulu	0.338	0.330	0.300	0.370	0.360	0.350	0.386
South Sumatera	0.316	0.300	0.310	0.340	0.340	0.400	0.383
Riau	0.323	0.310	0.330	0.330	0.360	0.400	0.374
East Kalimantan	0.334	0.340	0.380	0.370	0.380	0.360	0.371
Maluku	0.328	0.310	0.310	0.330	0.410	0.380	0.370
Banten	0.337	0.330	0.330	0.340	0.370	0.360	0.364
West Nusa Tenggara	0.328	0.330	0.350	0.400	0.360	0.350	0.364
West Sumatera	0.305	0.290	0.300	0.330	0.350	0.360	0.363
Riau Archipelago	0.302	0.300	0.290	0.290	0.320	0.350	0.362
South Kalimantan	0.341	0.330	0.350	0.370	0.370	0.380	0.359
Lampung	0.390	0.350	0.350	0.360	0.370	0.360	0.356
North Sumatera	0.307	0.310	0.320	0.350	0.350	0.330	0.354
East Nusa Tenggara	0.353	0.340	0.360	0.380	0.360	0.360	0.352
Central Kalimantan	0.297	0.290	0.290	0.300	0.340	0.330	0.350
West Sulawesi	0.310	0.310	0.300	0.360	0.340	0.310	0.349
Jambi	0.306	0.280	0.270	0.300	0.340	0.340	0.348
Aceh	0.268	0.270	0.290	0.300	0.330	0.320	0.341
North Maluku	0.332	0.330	0.330	0.340	0.330	0.340	0.318
Bangka Belitung	0.259	0.260	0.290	0.300	0.300	0.290	0.313
INDONESIA	0.364	0.350	0.370	0.380	0.410	0.410	0.413

Source: Central Bureau of Statistics

In total, there were 11 provinces with a Gini index above 0.40 in 2013. This included two provinces in Java (Jakarta and East Java), Bali, and five provinces on the island of Sulawesi (North Sulawesi, Gorontalo, Central Sulawesi, South Sulawesi and Southeast Sulawesi), as well as the two eastern most provinces of Papua and West Papua. Overall, provinces in the island of Sumatra came out slightly better, or lower in the Gini index, than other Indonesian islands with regards to inequality. The

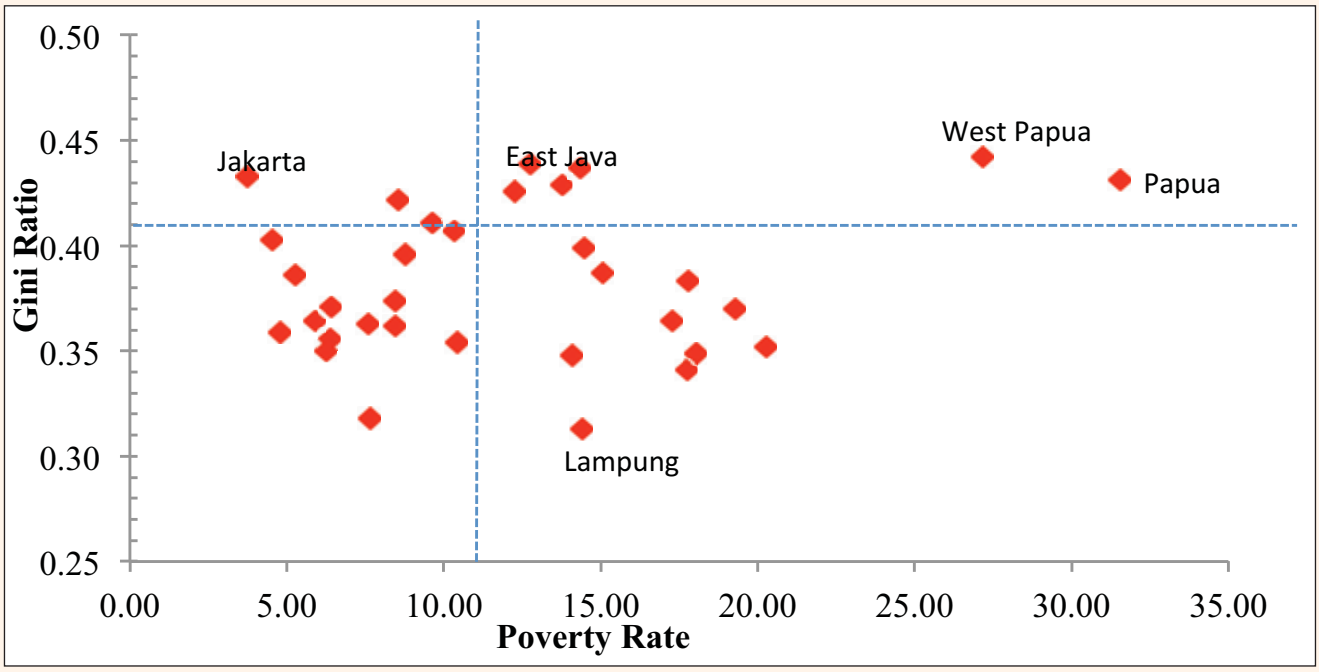
lowest Gini index in 2013 was found in the province of Bangka Belitung (0.313). Although the lowest, over time the Gini index in this province has increased. One challenge moving forward is the intergovernmental transfer mechanism to equalize the regions fiscal capacity does not bring a reduction in inequality.

For a visual illustration, Figure 3.9 presents more interesting evidence on the Gini index and poverty rates among provinces in 2013. The figure shows six provinces have poverty rates and Gini indexes lying above the national level (upper right quadrant). Among them, Papua and West Papua are the extreme cases. In contrast, Jakarta shows a Gini index above the national level along with the lowest poverty rates (upper left quadrant). In general, the figure shows that most provinces are grouped in the quadrants with lower Gini indexes and poverty rates than the national level (bottom left and bottom right quadrants).

It should be noted that statistical surveys in Indonesia tend to underestimate social disparities, mainly because of partial exclusion of the top income households. Indonesian national household surveys (SUSENAS) gather data on expenses for general commodity baskets, yet some non-food expenditures that are common in wealthier urban households are not collectedincluding payments for communication, technology, cars, holidays, overseas education, and health care. These expenditures remainlargely unobserved. Moreover, most well-to-do families markedly understate their personal consumption, saving, and investments; or alternatively, evade survey enumerators altogether.

FIGURE 3-9

Poverty Rate and Inequality (Gini Ratio): Indonesia, 2013



Source: Authors' calculation

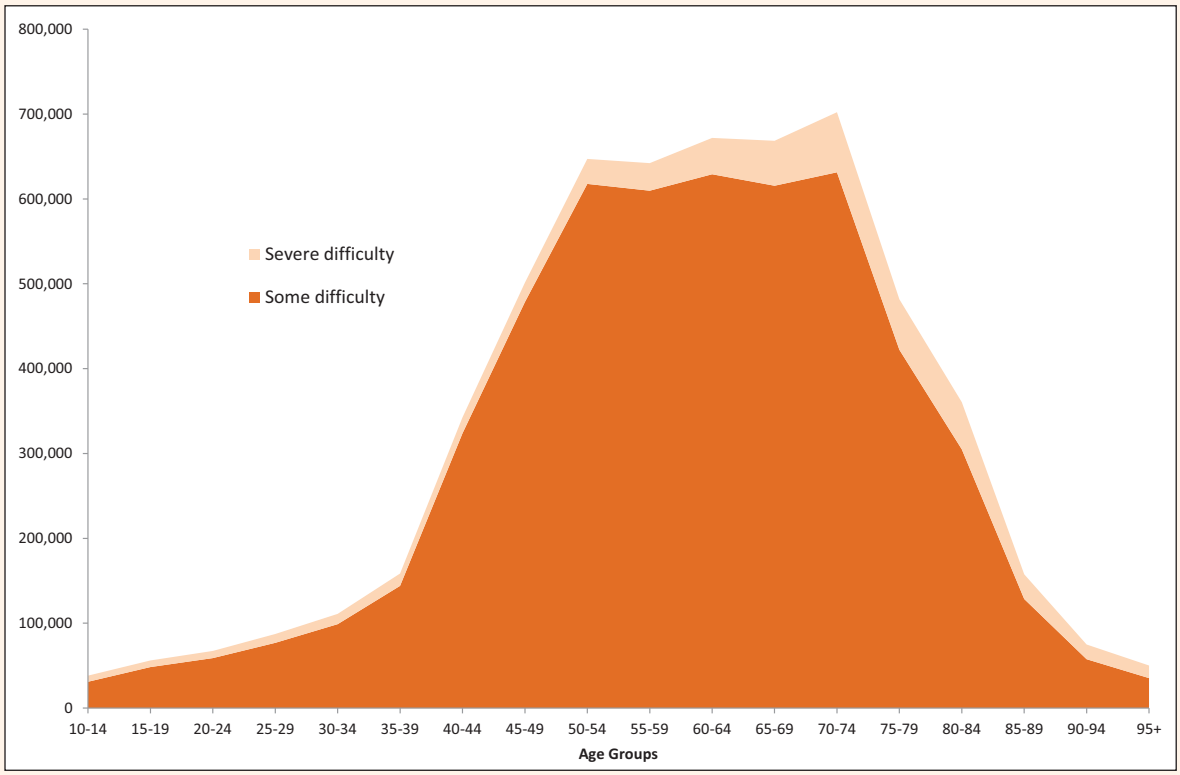
Preventing and Reducing Dysfunctional Ability

Disability and poverty are highly related. By disability we don'tnecessarily mean personal 'defect' but ratherthe interaction between human functioning and environmental barriers to participation in the community.The causality between disability and poverty goes in both directions. Poor people often have poor nutrition, less access to health care, poor sanitation and water, and generally live in inadequate environmental conditions. Therefore, poverty can create disabling conditions (Mont etal. 2013).Disability can also lead to poverty. In many cases, the physically disabled do not have access to facilities such as, education systems, which furthers their incapacity and ability to find decent jobs resulting in poverty.

The prevalence of disability also increases with age as older people are at higher risk of being disabled. This finding is supported by the 2010 Population Census data which collects incidences of disability among the population using the WHO's ICF (International Classification of Functioning) and recommendations of the Washington Disability Statistics (Mont et al. 2013). However, many cases of disability are found among young and productive ages mostly due to incidences at work or on the road. Disability among productive age persons holds additional implications, including a smaller demographic bonus. For instance, the data in Indonesia shows an increasing number of people with visual difficulties as age increases. The number jumps by five times among the prime working age population aged 35 to 54 years old from just 111 thousand among those aged 35-39, to 647.2 thousand people aged 50-54 (Ananta and Arifin 2013). Ultimately, this trend may affect the productivity

FIGURE 3-10

Number of Population with Visual Difficulties by Age and Degree of Severity: Indonesia, 2010



Note: Dark area refers to number of population with some difficulties
Light area refers to number of population with severe difficulties
Source: Ananta and Arifin (2013)

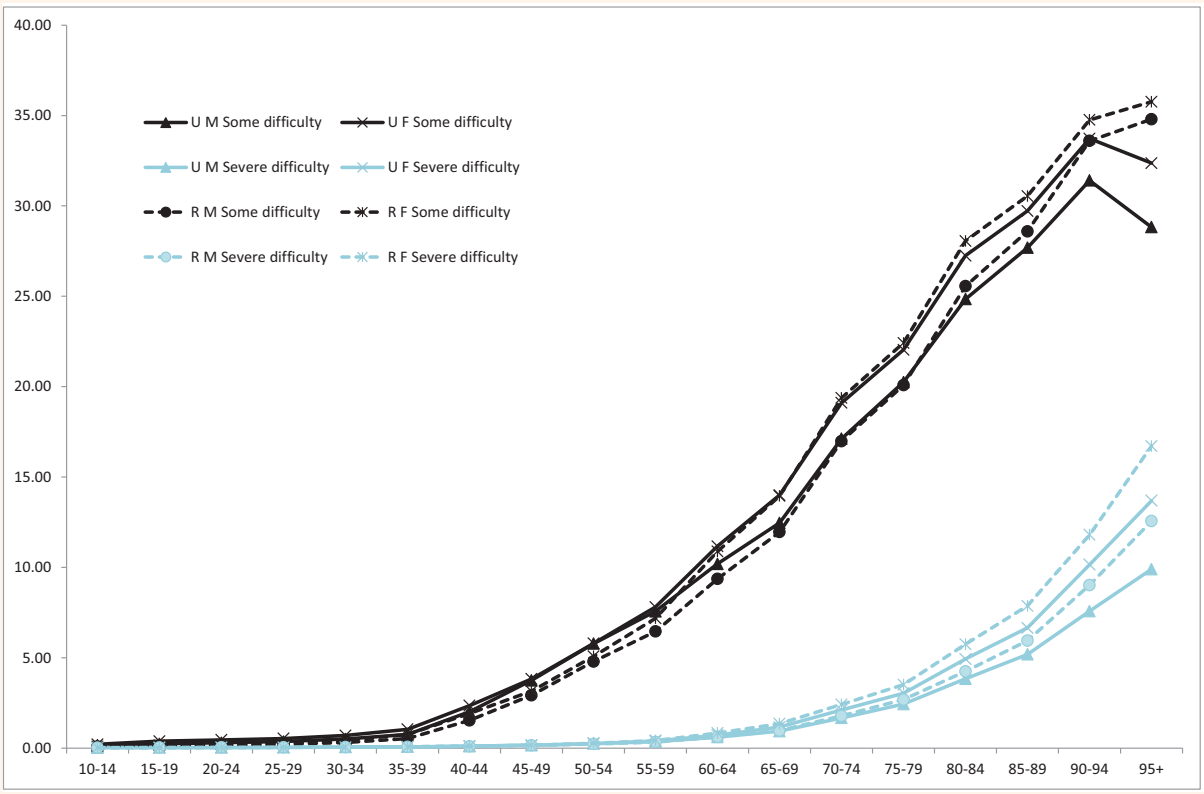
of the labor force. However, the number of people with visual disability is much larger among the older group aged 55-74 (2.7 million or 46.1 percent of total visually impaired) than the prime working age population of 35-54 (1.8 million or 30.3 percent of total visually impaired) as seen in Figure 3.10.

The 2009 SUSENAS (National Socioeconomic Survey) provides an estimate that 2.1 million Indonesians have disabilities, or 0.92% of the population. The 2010 Indonesian Population Census (with a much larger coverage than the SUSENAS) started collecting information on different types of physical difficulties which can be used as a proxy to understand the degree of disability in Indonesia. The information collected on disability is a self-assessment of physical and mental difficulties using three domains of functional difficulties (sensory, movement and cognitive). Sensory difficulty, includes visual and hearing difficulties. Movement difficulties covers walking, climbing stairs and taking care of themselves (i.e., overall daily living activities). And finally, cognitive difficulties include remembering or concentrating. Each question in the survey has three answers: no difficulty, some difficulty and severe difficulty.

According to the 2010 population census, there were 5.82 million Indonesians suffering from visual disability, with 47.8 percent of the visually disabled living in urban areas (Ananta and Arifin 2013). Women outnumber men in terms of visual disability with a sex ratio of about 0.80 or 3.2 million women, versus 2.6 million men. Figure 3.11 displays the age specific prevalence of visual difficulties according to urban-rural differences. The graph forms a J-shape, reflectinga variation in the

FIGURE 3-11

Age-Specific Prevalence of Visual Difficulty by Degree of Difficulty and Place of Residence: Indonesia, 2010



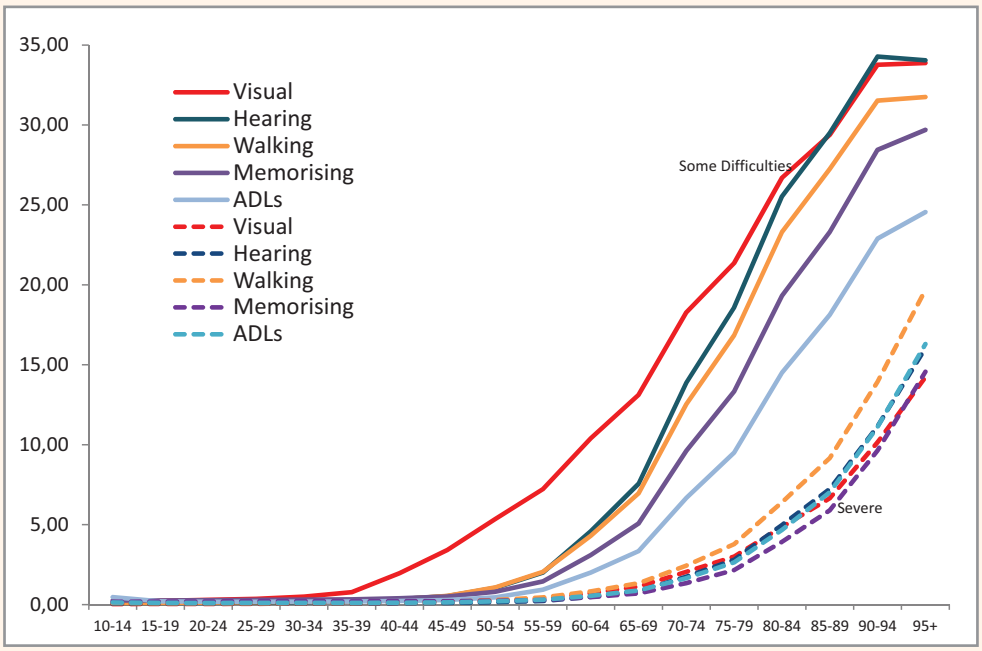
Source: Ananta and Arifin (2013)

threshold of acceleration by the degree of disability. For instance, the prevalence of visual difficulty accelerates earlier among people with "some" disability than in people with "severe" disability.

Figure 3.12 indicates that visual difficulty has an earlier acceleration rate than other types of difficulty. The prevalence of visual difficulty starts accelerating at the age of 35, while hearing difficulty starts at the age of 50, and difficulty in Activity Daily Livings starts the latest, atage 60. With regards to the degree of difficulty, the prevalence of severe difficulty in walking is the highest. Givenan aging population as one of Indonesia's mega trends, it is necessary to take into account all types of physical difficulty in sustainable development to benefitIndonesia's performance. In addition, the gender differential among older ages tends to widen,as older women have a higher percentage of physical difficulty than that of men. These issues of addressing difficulty remain a challenge ahead for Indonesia.

FIGURE 3-12

Age-Specific Prevalence of Physical Difficulty by Type and Degree of Difficulty: Indonesia, 2010



Source: Authors' calculation from the 2010 Population Census online publication

Disability and long-term care are also closely related. Disability can seriously impact economic, social and psychological aspects of life in persons with disability, as well as, their families and communities. Therefore, health care services should be developed to alleviate and prevent disability and itsassociated impact. Long-term care is needed to maintain the highest possible quality of life, according to individual preferences, and with the greatest possible degree of independence, autonomy, participation, personal fulfilment and human dignity. Long-term care includes both informal and formal support systems. The latter may include a broad range of community services (e.g., public health, primary care, home care, rehabilitation services and palliative care), as well as institutional care in nursing homes and

hospices. Treatments that halt or reverse the course of disease and disability are also considered part of long term care. Ensuring that "no one is left behind," as envisaged in the post-2015 HLPEP, requires putting disability related issues onto the development agenda.

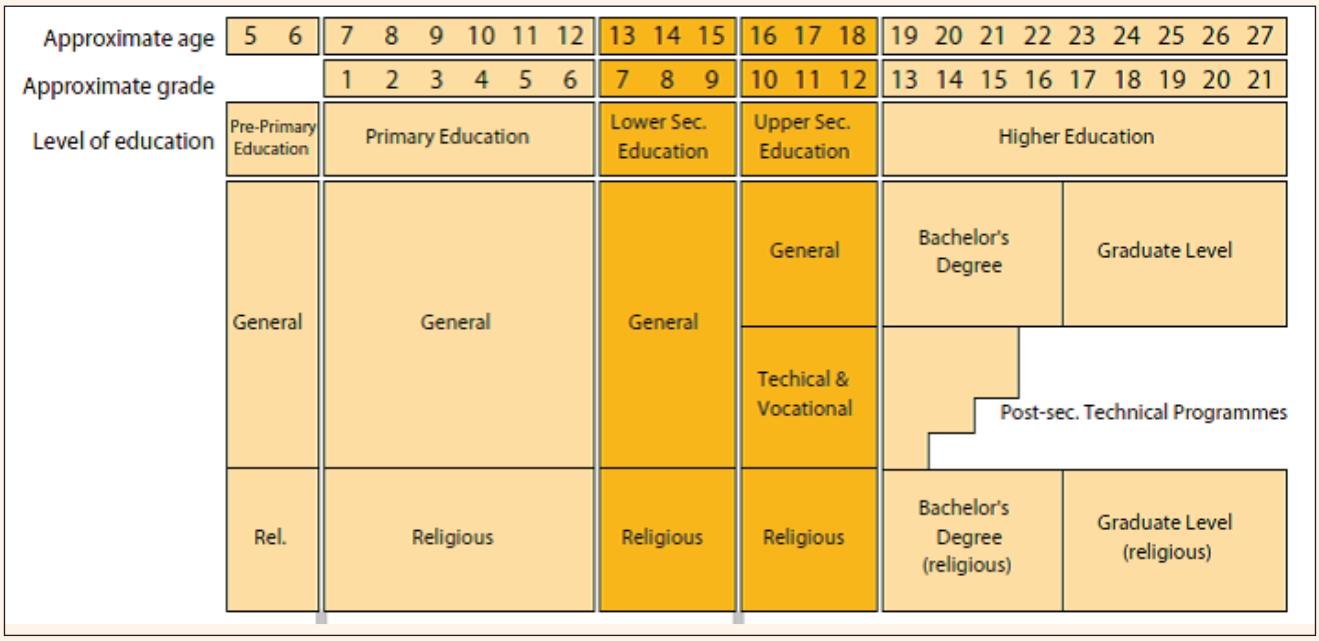
3.2.2 Ensure Access to Quality Education

Over the last decade, Indonesia has made substantial progress in improving education outcomes, such as reading, literacy and expanding access to education. However, quality of education remains a challenge despite improvements. For example, quality of education has increased due to teacher certification which provides additional incentive for teachers to continously improve their skills and knowledge. For the government to achieve sustainable development, they must promote access to quality education for all citizens. One way to do this is through lifelong learning, and herein, Indonesia has committed to lifelong learning as one key area of sustainable development. For example, lifelong learning includes a better understanding of the environment, individual health, and justice. Indonesia's commitment to lifelong learning led to their hosting of the South-South Policy Forum on Lifelong Learning in Jakarta in 2008.

In anticipation of future trends, the following sub-sections discuss the outcomes of the Indonesian educational system on different age groups of the population. Prior to that, a brief description of the education system in Indonesia is provided.

FIGURE 3-13

Education System in Indonesia



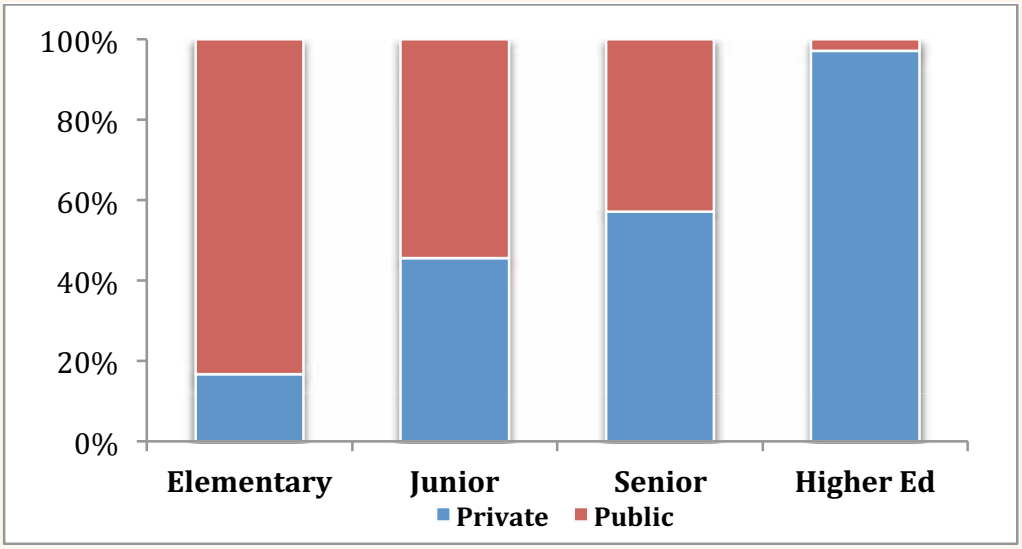
Source: Authors' Illustration

Education system in Indonesia

Indonesia has the most number of institutions available for primary education, as compared to other education types, with the number of primary schools/institutions standing at 180,913. In contrast, according to the Ministry of Education, only 49,268 junior high schools exist, 19,283 senior high schools, and 3,016 institutions available for tertiary education. However, the number of people requiring education above junior high school continues to increase with the new law requiring 12 years of compulsory education. Furthermore, Figure 3.14 illustrates two contrasting features of the education system. At the primary education level, there are more public institutions (83 percent of primary education institutions) than private ones; whereas, at the higher education level more private institutions exist (97.2 percent of tertiary education institutions) than public institutions. Therefore, expansion of infrastructure is needed to build more higher-level public education institutions to support Indonesia's growing human capital and sustainable development efforts.

FIGURE 3-14

The Share of Public and Private Educational Institution by Level of Education: Indonesia



Source: Ministry of Education and Culture

Early Childhood Education

Early childhood education is an important foundation inthe learning journey. While Indonesia has set a goal for three-quarters of children up to the age of 6 years old receive early childhood education, today less than half of these children actually access such services. Early childhood education is criticalto a child's overall growth and development while improving their preparedness for school later in life. The number of children aged 7-12 years old (or potential children attending primary school) will continue to increase until 2020 to 28.38 million, an increase from 26.80 million in 2010. After 2020, their numbers will slightly decline to 27.61 million. Thus, pressure on primary education infrastructure will remain, along with increased demand for higher quality primary education to meet the growing needs of knowledge-based development.

In Indonesia, significant progress has been made toward achieving universal primary education as evident from high enrollment rates. For example, primary school enrollment rates reached 97 per cent in 2010. Currently around 26 million children attend primary schools, of which 2.5 million complete their primary education.There are slight differences between enrollment rates of girls and boys at the primary level, but little difference between urban and rural areas. However, there is a 15 percent gap between the worst performing province (Papua) and the best performing province (Aceh) which is problematic.

Currently, the population aged 13-15 is projected to increase until 2025 from current numbers of 13.18 million in 2015 to its peak at 14.25 million in 2025. However, educational attainment beyond primary education will still be a challenge. In 2010, a significant number (63.19 percent) of children aged 13-15 years old attained their education at a primary level. Some of these students may still be finishing their junior high school, asonly a quarter of children end up finishing their junior high school. Further still, some are still schooling on a junior high school level and have not obtained their certificates.

The gap in percentage between urban and rural areas for those that finished junior high school isabout 10 percent(28.86 percent versus 18.56 percent, respectively). Interestingly, more girls than boys attended junior secondary school (25.55 percent versus 21.50 percent). These statistics emphasize how compulsory education beyond primary school is still needed. Additional teachers should be available and the quality of teachers should also be enhanced. Cost of education is another critical issue in Indonesia. Investing in children yields high and long-lasting returns, not only for individuals and families, but for entire societies and the generations to come.Societies can only develop in a sustainable manner if the basic needs and rights of children, such as access to education, are met. In particular, attention must be paid to the poorest and most vulnerable.

Education of the Youth

Typically, youth have a high rateliteracy rate. The 2010 Population Census shows the literacy rate among this population was over 98.0 percent with insignificant differences between young girls (98.6 percent) and boys (96.5 percent). Data shows more than half of the senior high school population (aged 16-18) were still attending school. There was no significant differences found between genders, but there were significant differences between rural and urban areas. For example, we observe that more than half (59.41 percent) of the urban youth aged 16-18 were still attending school, compared to less than half (46.91 percent) of its rural equivalent. National level attendance rates were even worse for the tertiary school age youth (aged 19-24) with only 15.09 percent still attending school. Again, the urban youth age 19-24 still schooling was larger than the rural youth of the same ages (20.46 percent vs 8.84 percent, respectively).

Meanwhile, among the older youth, Table 3.5 shows the largest percentage of those aged 19-24 holding senior high school degrees was found in Yogyakarta, followed by Riau Archipelago and Jakarta. On the other end of the spectrum, Papua had the largest percentage of population aged 19-24 years who never attended school while Gorontalo had the largest percentage of this age group who had not completed their primary school. Low educational attainment of this population group reflects a tough development challenge as an increasingly large number of the productive age population having low educational levels means limited job opportunities

and potentially limited economic growth. If Indonesia cannot reverse this trend quickly the otherwise favorable age structure, of a large number of productive age population, can become a liability.

TABLE 3-5

Educational Attainment of Population Aged 19-24 by Province: Indonesia, 2010

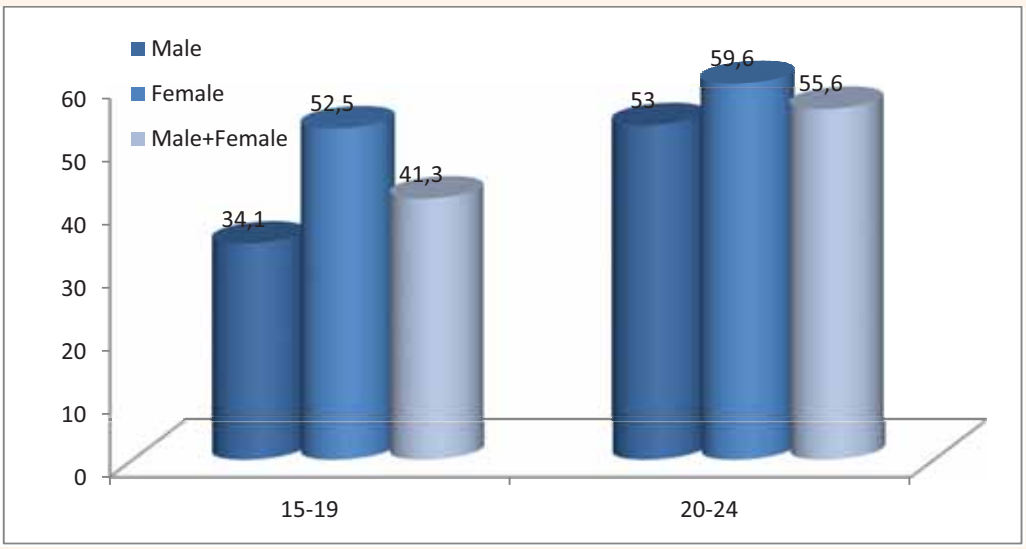
Province	Never Attended School	Not Completed Primary School	Primary School	Junior High School	Senior High School	Diploma I,II,III	Diploma IV/Uni/ Prostgrad	Total
Jakarta	0.24	1.11	9.48	21.35	59.15	3.85	4.79	100.00
Yogyakarta	0.91	0.68	4.89	16.37	69.27	3.36	4.53	100.00
Bali	1.70	1.71	15.09	20.34	52.33	5.41	3.42	100.00
North Sulawesi	0.62	5.28	16.02	20.40	53.01	1.86	2.81	100.00
West Sumatera	1.07	5.00	16.20	21.21	50.42	3.46	2.64	100.00
South Sulawesi	3.35	4.61	23.76	18.51	44.53	2.62	2.61	100.00
Bengkulu	1.18	4.00	20.63	23.65	45.31	2.64	2.60	100.00
East Kalimantan	1.12	3.39	17.46	21.38	51.24	2.99	2.41	100.00
West Papua	4.91	5.31	16.19	22.67	46.25	2.28	2.39	100.00
East Java	1.53	2.13	21.55	27.43	42.99	2.15	2.23	100.00
West Nusa Tenggara	4.11	3.89	22.57	22.67	42.53	2.05	2.18	100.00
North Sumatera	1.68	2.72	14.31	22.47	54.08	2.62	2.13	100.00
Jambi	1.41	3.88	24.00	25.37	40.46	2.82	2.06	100.00
Banten	1.02	2.33	24.45	25.68	42.48	1.99	2.06	100.00
South Kalimantan	1.09	5.51	27.95	25.56	35.44	2.40	2.04	100.00
Aceh	0.96	2.03	13.91	21.99	54.64	4.45	2.01	100.00
Southeast Sulawesi	2.59	5.41	20.55	20.32	45.74	3.44	1.95	100.00
West Java	0.84	2.13	26.88	26.25	39.61	2.35	1.95	100.00
Maluku	1.77	5.35	21.33	19.56	46.62	3.43	1.94	100.00
South Sumatera	1.27	4.35	26.86	23.41	39.74	2.46	1.92	100.00
North Maluku	1.79	3.51	15.94	16.93	57.56	2.42	1.85	100.00
Central Sulawesi	2.43	5.33	27.76	20.95	38.96	2.73	1.85	100.00
Central Java	0.76	1.93	22.40	31.94	38.89	2.28	1.81	100.00
Central Kalimantan	0.94	5.17	30.55	25.96	33.17	2.42	1.78	100.00
Riau	1.04	3.23	20.99	24.23	45.78	2.99	1.73	100.00
West Sulawesi	5.18	9.25	30.62	18.77	31.83	2.63	1.71	100.00
Gorontalo	2.04	18.07	24.72	15.44	35.45	2.71	1.58	100.00
Riau Archipelago	1.30	2.49	10.94	16.42	64.61	2.74	1.49	100.00
Bangka Belitung	2.13	8.34	30.68	20.00	34.81	2.56	1.48	100.00
Lampung	0.70	2.61	22.83	33.16	36.89	2.40	1.40	100.00
West Kalimantan	3.06	8.43	30.32	22.55	32.15	2.12	1.38	100.00
Papua	28.37	5.95	14.37	17.44	31.13	1.39	1.35	100.00
East Nusa Tenggara	5.16	8.36	31.41	18.65	33.60	1.58	1.24	100.00

Source: Compiled and Calculated from Badan Pusat Statistik.

Employment status among working youth shows that less than half of the population aged 15-19 work in the formal sector (41.3 percent), while this rate increases with age to more than half (55.6 percent) for the population aged 20-24. Interestingly, young girls of both age groups(15-19 and 20-24) are more likely to work in the formal sector than young boys as seen in Figure 3.15.

FIGURE 3-15

Percentage of Formal Workers Aged 15-24 by Sex:Indonesia, 2012



Source: Calculated from Sakernas 2012

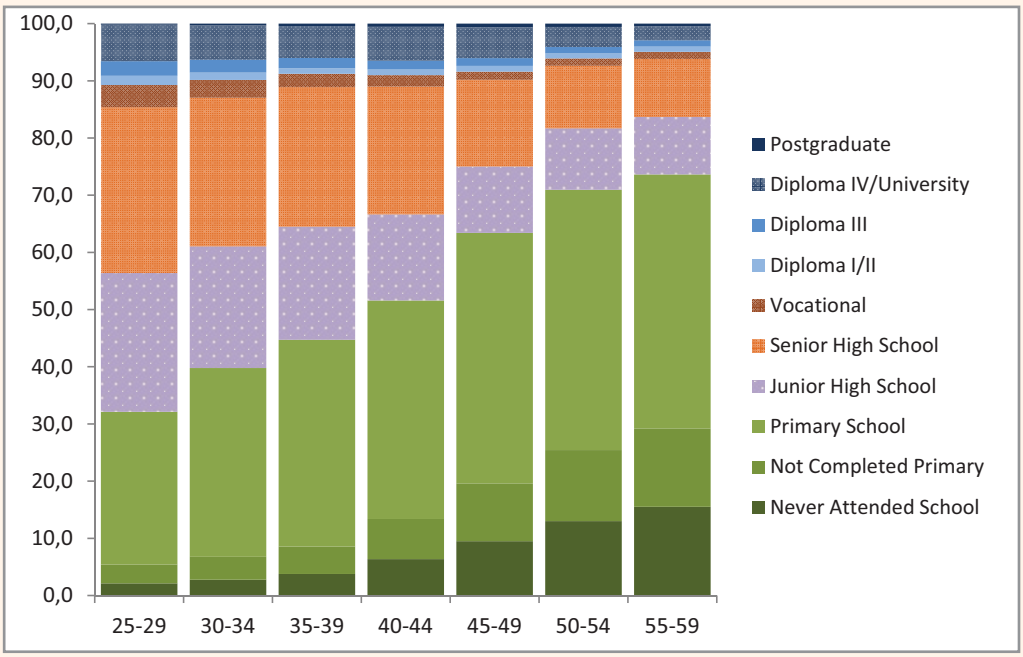
Education of Prime Working Age Population

Despite the larger number of prime working age population, the 2010 Population Census pointed to a large proportion of this population (aged 25-59) lacking in higher educational attainment with only half having attended primary school (49.77 percent), or about 54.8 million people. Furthermore, among this population around 7.0 million never attended school and 7.6 million did not complete primary school. In the near future, it is highly unlikely that this portion of the population will pursue formal education higher than primary school unless required for job trainings and workshops.

Less than 10 million of the prime working age population attended any form of tertiary education, such as diploma or universities. For example, Indonesia had only about 603,000 *Sarjana Teknik*, or Bachelors in Engineering graduates, in 2010. Compared to neighboring countries, this figure is low. Indonesia had only 2,671 per one million *Sarjana Teknik*, which is smaller than in neighboring Malaysia at 3,333 per one million, and Thailand with 4,121 per one million. The Indonesian ratio is extremely small next to South Korea's figures of 25,309 per one million population.

FIGURE 3-16

Educational Attainment of the Prime Working Age Population by Age: Indonesia: 2010



Source: Central Bureau of Statistics

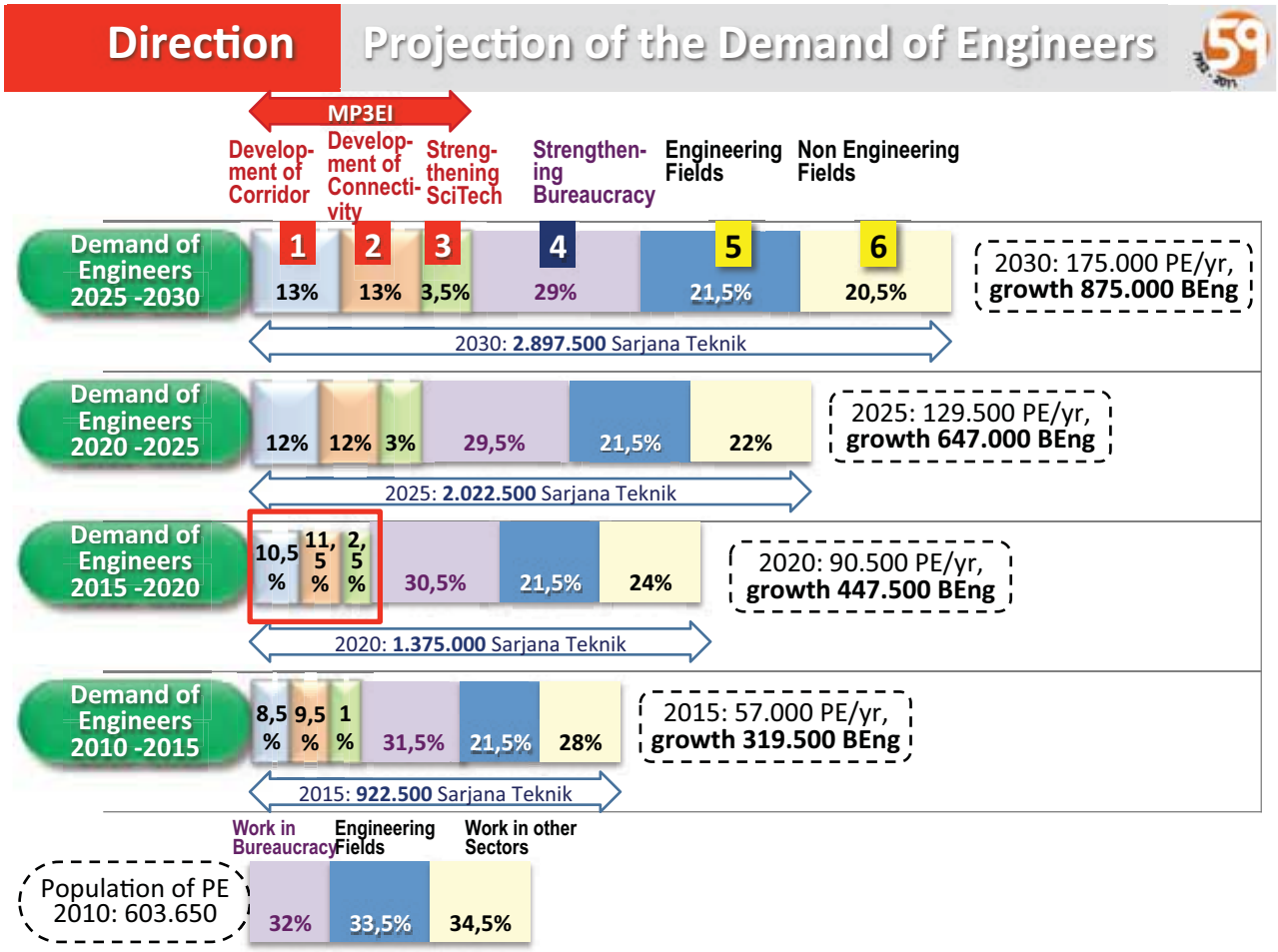
As observed in Figure 3.16, educational attainment among the prime working age population varies by age group. If divided into two groups, aged 25-39 and 40-59, among the former group we observe a slight improvement with more than half holding education certificates above primary education levels. However, in the latter group more than half hold primary education and below. One explanation may be that those in the 40-59 age group, or born before 1970, may not have had access to higher education during their early years. In addition, it must be anticipated that by 2030 a large number of those in the 40-50 age group will become old. This change must be prepared for in the form of financing through various channels such as, public transfer, as health expenditures rise (e.g., social security system); infrastructure provisions for older persons; and promoting family support values. Given that the future old population has low educational attainment and low labor income, they are limited in their assets and ability to finance their retirement. To achieve some of Indonesia's Sustainable Development Goals (SDGs), it becomes imperative for Indonesia to address this population change in order to reduce capability depriviation. This is one of the many links between population dynamics and sustainable development.

However, it is different among the younger ones, aged 25-39, who were born after 1970. At this point in time, the government had made a commitment to education through building a great number of *SD Inpres* (primary schools) and had continued with compulsory education of 6 years, 9 years and 12 years. As a result, this population has higher levels of educational attainment although there is still room for improvement with the percentage of university graduates still below 10 percent. Moving forward, Indonesia will continue to face challenges in ensuring their potential workers receive the right levels of education.

Taking into account the country's future needs for engineering, Indonesia is projected to have more bachelors of Engineering with an additional 319,500 produced between 2010 and 2015. The need for this degree/skillset will only increase to 447,500 persons in 2015-2020, 647,000 in 2020-2025, and 875,000 in 2025-2030 (Figure 3.17).

FIGURE 3-17

Projection for the Need of Engineers

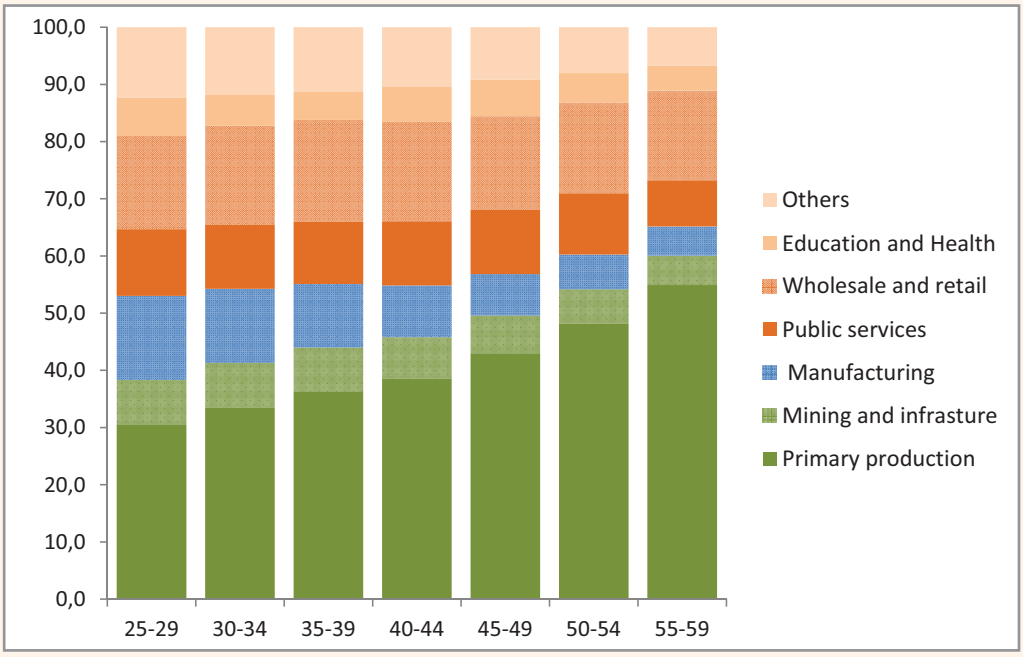


Source: Authors' Illustrations

Indonesia's employment structure, as seen in Figure 3.18, shows around 50 percent of the young population work in non-agriculture sectors, particularly in service sectors including public services, wholesale and retail, education and health, and others. Those working in manufacturing accounted for more than 10 percent, while less than 40 percent worked in primary production/agriculture and mining. By contrast, older workers aged 50-59, worked mainly in primary production/ agriculture and mining, and less than 30 percent worked in service sectors. The employment structure in Indonesia is similar to that of Thailand, but differs from Malaysia where more than half of their workers are employed in the service sectors. In South Korea, the service sectors absorbed more than 60 percent of its workers, followed by manufacturing and agriculture. Job creation in highly productive sectors is critically important for Indonesia's future development.

FIGURE 3-18

Employment Aged 25-59 by Main Industry and Age: Indonesia, 2010



Source: Central Bureau of Statistics

Education of Older Persons

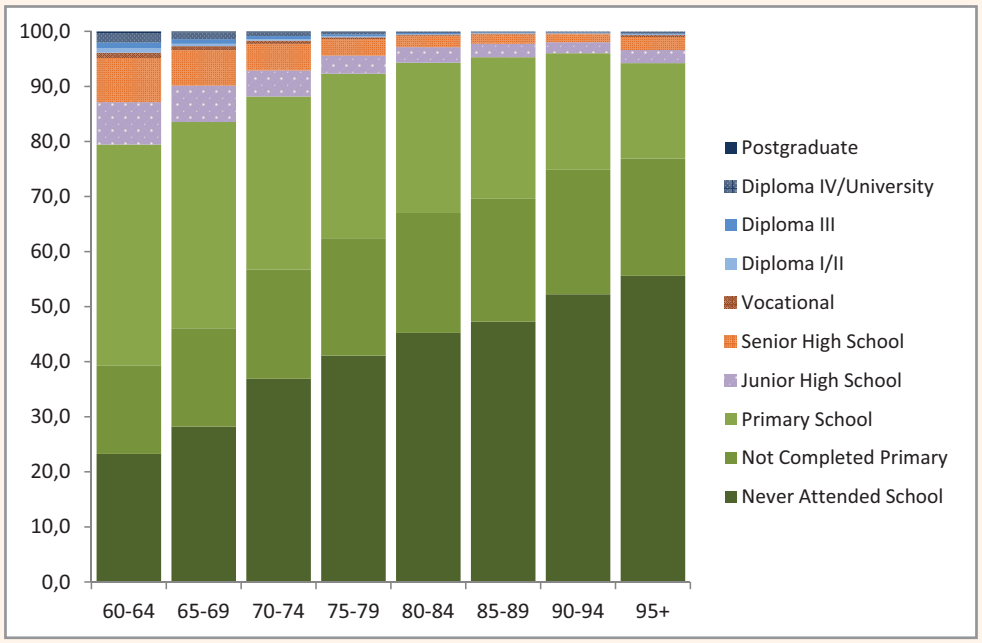
Educational attainment of older persons, aged 60 and above, in 2010 was relatively low with more than 80 percent of this population having a maximum ofa primary school education. As seen in Figure 3.19, across the entire older personsage group there are many who never attended school. However, within the older persons group there was an age differential in educational attainment. Figure 3.19 points out that just below 80 percent of the youngest elderly (aged 60-64) attended primary school and below, with most having completed primary school. Despite the low levels of educational attainment in this group, it is an improvement when compared to the oldest elderly, aged 95 and above. The eldest group shows 90 percent attended primary school and below, but more than half of this population never attended school. This low level of education among the current older persons can be seen asa reflection of the difficult life history they experienced during the pre-independence period.

Furthermore, Figure 3.20 depicts an interesting pattern of the main industries among older workers aged 60 and above. Overall, older persons mostly work in the agricultural sector, but with a substantial proportion working in service sectors, and the remaining in the manufacturing industry. The figure also shows an age differential in the type of industry where older persons are working. For example, the pattern of working in agriculture by age shows an inverted U curve. Moreover, the percentage of employment in each group is never lower than 60 percent except for the oldest group. Interestingly, across age groups the percentage of older persons working in manufacturing seems to increase as age increases with the largest percentage found among the oldest old aged 95 and above.Given the right policy environment, by 2030 the employment profile of older persons will

improve as more older persons shift to more productive sectors. As such, the future older persons become an important asset for Indonesia to achieve sustainable development.

FIGURE 3-19

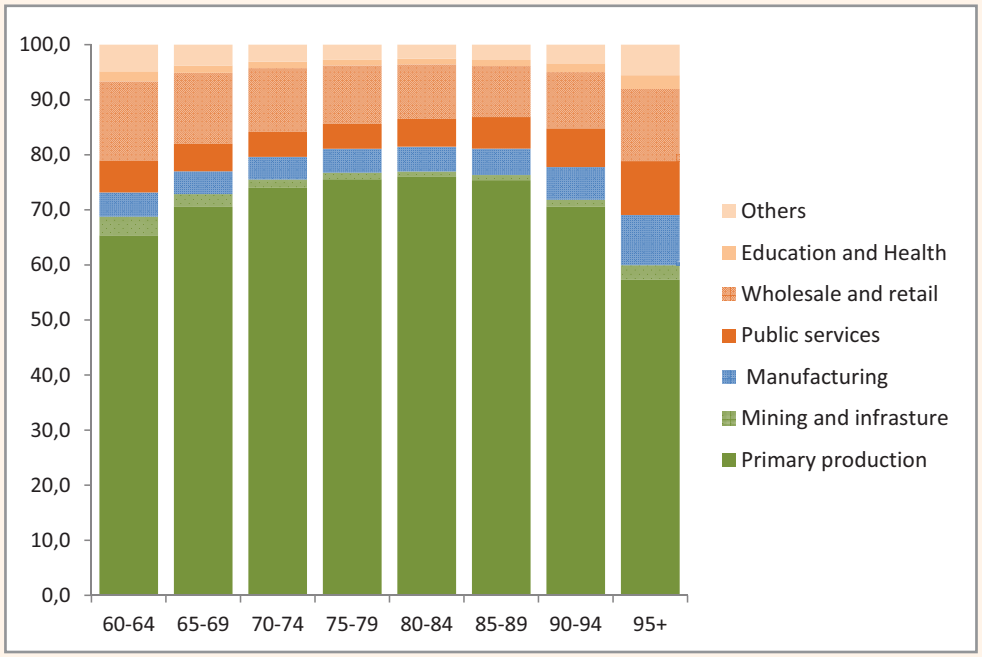
Educational Attainment of Older Persons by Age:Indonesia, 2010



Source: 2010 Population Census, CBS

FIGURE 3-20

Employment of Older Persons by Main Industry: Indonesia, 2010



Source: Compiled and calculated from CBS (2010)

Quality of Education

There are several indicators to examine the quality of education in Indonesia, including: national examinations, international mathematics and science assessments (such as,Trends in International Mathematics and Science Study, TIMSS), and Programme for International Student Assessment (PISA). The national examination is given to all students enrolling in grade nine (junior secondary school) and grade twelve (senior secondary school). At the junior secondary school level, students are obliged to take the national examination for main subjects, such as Indonesian, English, Mathematics, and Science. Meanwhile, senior secondary school students majoring in science, for example,are tested on Indonesian, English, Mathematics, Physics, Biology, and Chemistry. The government sets the passing point necessary to graduateat 5.5, however, the overall effectiveness of the national examination has been questioned. Many scholars criticize the national examination as a poor way to assess quality of education by claiming that it only measures a student's cognitive ability, and particularly memorization ability (Oey-Gardiner 2005; Lie 2007).As such, teachers tend to focus on rote learning, repetition and memorization of a subject to ensure success in the examinations. Furthermore, given the high pressure to pass the exams, there has been evidence of cheating across Indonesia. Many schools even facilitate cheating by distributing answer sheets before the exam in efforts to accelerate the percentage of passing students. Schools are afraid that a low percentage of passing students will reduce their school accreditation and lower their chances to attract new students.

From the subject matter perspective, mathematics and science are globallyvalued and recognized fields. As such, several international tests exist to assess the quality of education in mathematics and science in a particular country. TIMSS is one test that was designed to compare and contrast the teaching and learning of mathematics and science in elementary and secondary schools around the world. In 1995, the first round of TIMSS (*Third* International Mathematics and Science Study*)* data was collectedin Grades 3 or 4, Grades 7 or 8 and Grade 12. A second round of data collection was held in 1999, followed by a third and fourth in 2003 and 2007, respectively. Later, TIMSS changed and became Trends In Mathematics and Science Study.

In the first round 26 countries participated in TIMSS with Indonesia only joining inthe second round when participation increased to 38 countries. In 1999, Indonesia scored 40 in mathematics, above the Philippines (35) and Chile (39), but much lower than Malaysia (52) and Singapore (60). In science, Indonesia scored 44, above the Philippines (35) but lower than Malaysia (49) and Singapore (57) (EQAO 2000). In 2007, Indonesia ranked36th in mathematics out of 48 countries, placing it below Thailand (29th), Malaysia (20th), and Singapore (3rd). For science, Indonesia ranked 35th out of 48 countries, also below Thailand (22th), Malaysia (21th) and Singapore (1st). This data indicates thatthe quality of mathematics and science education for Indonesian students is lower than that of neighbouring countries in the Southeast Asia region. Improving the quality of education in mathematics and science has now become a national priority in Indonesia.

Another indicator of educational quality is the PISA survey. PISA is an international survey aiming to evaluate global education systems by testing the skills and knowledge of 15-year-old students. The 2012 PISA was attended by around 510,000 students from 65 countries. Results show that, on average, Indonesians scored 375 in mathematics compared to an average of 494 points or 75.9 percent. Among 65

participating countries, the mathematics score for Indonesian students was second to last (64) out of 65. In science literacy, Indonesians scored 382 points, compared to an average of 501 points or 76.2 percent. The PISA also conducted a test on reading performancewhere Indonesians scored 396 points compared to an average of 496 points in OECD countries, or about 80.0 percent from the OECD average.

In general, access to education has improved significantly. Young generations have reached higher educational attainment than older generations due to better access to education. However, the government should not focus only on expansion of education but also on quality of education. A rising number of the working population need to have access to a quality education to increase productivity and remain competitive while building the future Indonesia wants. Younger and older persons can also contribute to Indonesia's future thus access to a quality education must also reach these important populations.

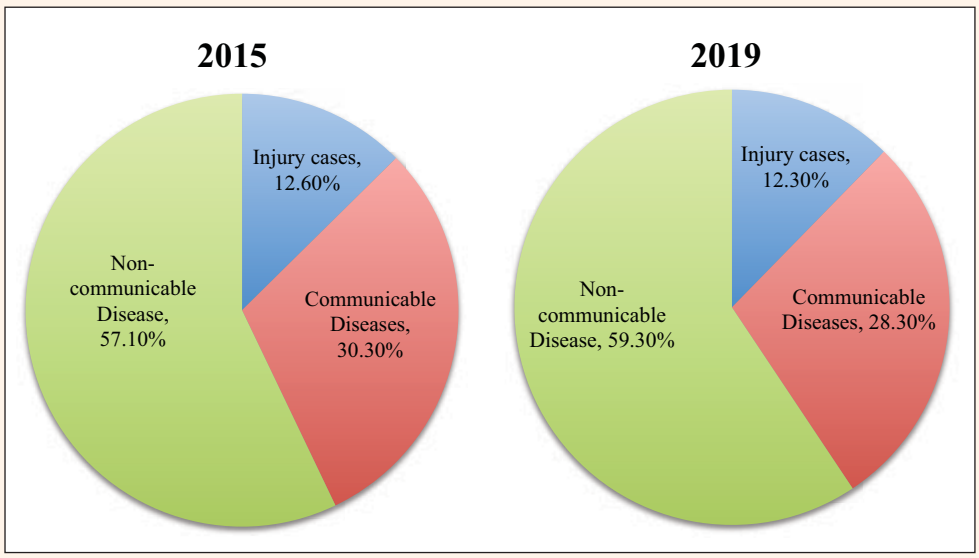
3.2.3 Promote Health and Well-being

Health of General Population

The WHO defines health as not simply the absence of disease or infirmity, but rather a state of complete physical, mental and social well-being throughout the life cycle starting from embryo, to old age, and finally, death.Despite a broad notion of health, this section will focus ona traditional discussion of health as disease.

In the last few decades, Indonesia has experienced a significant change in age structural transition due to a long-term decline in fertility and mortality rates alongside an increase in life expectancy. This change in age structural transition, accompanied by rapid changes in technology and lifestyle, has lead to an epidemiological transition. Indonesia is experiencing a shift in patterns from communicable (i.e., transmissible infectious disease from one person to another) to non-communicable diseases (i.e., non-infectious and non-transmissible) and disability. As shown in Figure 3.21, estimates show that Indonesia's health burden will gradually shift from more communicable disease in 2015 to more non-communicable diseasesby 2019.

FIGURE 3-21
Health Burden in Indonesia



Source: Kosen (2014)

However, Indonesia currently is still in the early phase of this epidemiological transition. Several communicable diseases, such as tuberculosis (TB) and malaria, still account for 0.4 and 6 percent of total disease in Indonesia.Yet the prevalence of diabetes, a non-communicable disease, is also quite high at 1.5 percent (Ministry of Health 2013). The rising trend in non-communicable disease emphasizes the need for providing quality health services to prevent and treat non-communicable disease in the future. In order to achieve sustainable development, and fully capitalize on the demographic bonus, Indonesia needs to anticipate future health trends and plan accordingly. Meanwhile, the post 2015 development agenda reached a consensus that reducing the burden of non-communicable diseases, or NCDs, isa global priority. Thus, inclusion of health indicators into the post 2015 development agenda is imperative as health promotion remainsan important goal of sustainable development.

Diabetes mellitus (DM) is one of the important NCDs that leads to other diseases and causes disability. Like many countries undergoing rapid socioeconomic transformation, Indonesia is struggling with a fast-growing burden of diabetes. Among nations, Indonesia ranked seventh in the world with 8.5 million of its population aged 20-79 years having diabetes (IDF 2013). This estimate is relatively similar toan earlier estimate by Wild et al. (2004) of 8.4 million cases of diabetes in Indonesia in 2000, thus ranking Indonesia as fourth largestin number of diabetics, after India, China and the US.

However, gender disparities are observed asthe number of female diabetics is larger than number of male diabetics. Also, a rural/urban disparity exists with a larger number of diabetics inurban areasas compared to rural areas. In 2013, almost 20 percent of the population aged 20-39 were diabetics and this increased to 26.08 percent of the older population aged 60-79 years old having diabetes. The largest percentage of diabetics was seen among those aged 40-59, or 54.38 percent. Older persons withdiabetes are at increased risk of some form of functional impairment resulting from diabetes complications. Based on a study on Riskesdas (Riset Kesehatan Dasar/ Basic Health Research) conducted in 2007, DM contributed to 4.2 percent of the deaths among the urban population aged 15-44, or the sixth largest cause of death for this population. Among urban 45-54 year olds, diabetes related deaths jumped to the second largest cause of death at 14.7 percent. In rural areas, diabetes related deaths were the sixth largest cause of death for the corresponding population (5.8 percent).

According to the Blue Print for Change report (Novo Nordisk 2013), by 2030 the number of people with diabetes in Indonesia will increase to 11.8 million with an annual growth rate of 6 percent; a rate that exceeds the country's overall population growth. Wild et al. (2004) estimate an even larger number, 21.3 million Indonesians, will suffer from diabetes. This massive number and increasing growth rate is a cause for concern. Higher prevalence rates of diabetes mellitus are related to rising living standards, lack of exercise and poor dietary habits — all lifestyle patterns that tend to accompany urbanization.

From a policy perspective, diabetes will continue to increase in the future as lifestyle patterns have become more unhealthy. As such, effective prevention and control programmes are needed. As previously discussed, Indonesians will become more mobile and urbanized – two potentialtrends driving the anticipated rise in prevalence of diabetes mellitus. Poorly managed diabetes can lead to serious complications and early deaths. Diabetic complications can lead to coronary artery

and peripheral vascular disease, stroke, diabetic neuropathy, amputations, renal failure and blindness. Furthermore, complications can result in increased disability, reduced life expectancy and enormous health costs for every society. Diabetes is certain to be one of the most challenging health problems in Indonesia, and if not managed wisely, the prevalence of DM among the productive age population may turn the rising number of productive age population into a liability rather than a bonus.

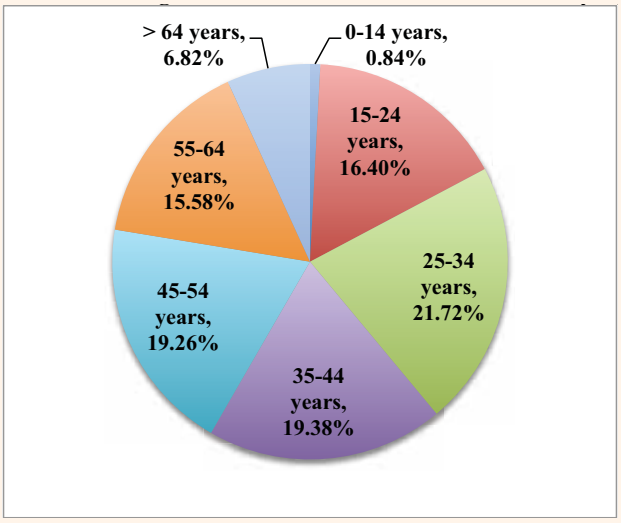
Communicable diseases are not given priority in the post-2015 development agenda, however, an airborne diseasecalled TB (tuberculosis),is the second leading cause of death among adults in Indonesia. Indonesia has the third highest TB infection rate in the world (USAID Health 2009).This infectious disease isprimarily transmittedthrough coughing and sneezing, wherebya person with active TB can further transmit the infection to 15 people in a year. TB is both contagious and costly. Treating a patient requires at least six months of daily medication and this can be lengthened for up to two years for those suffering from multidrug-resistant strains. Meanwhile, a greater concern is that a multidrug-resistant strain can spread even faster. Beside daily medication, TB patients need to visit a heath care facility regularly which can be costly for those living in poverty that may need to travel long distances to visit this facility.

The growth of TB in recent decades has been fuelled by the spread of HIV as TB is the most commonco-infection with HIV. However, currently the two diseases are treated separately. Progress in fighting TB will depend in part on implementing an integrated TB/HIV treatment strategy. Similar to other countries, stigma surrounding the disease prevents infected persons from seeking help and remains one of the major challenges to fighting TB inIndonesia.In particular, the poor are at higher risk of contracting TB due to a lack of education and poor living conditions.

As seen in Figure 3.22, new cases of TB among those aged 25-34 was 21.72 percent, followed by those aged 35-44 with a lower percentage at 19,38 percent, and lastly, 19.26 percent among those aged 45-54. Children tend to getinfected due to high rates of malnutrition, however,TB is more prevelant among adults especially the working age population. In addition, the incidence of TB is higher in urban cities due to conditions of crowding that facilitate the spread of the disease.

FIGURE 3-22

The Percentage Distribution of the New Cases of TB by Age: Indonesia



Source: Ministry of Health 2013

More than half of Indonesians infected with TB are of productive age, thus are prevented from earning income. As a consequence, the infected are often trapped in a cycle of poverty. In addition, stigmas associated with TB further isolate sufferers from their family and society. Misperceptions surrounding TB exist with many Indonesian people believing it is an inherited disease and incurable, or a curse placed on the individual for their evil wrongdoings. As a result, adults will not seek treatment in order to prevent the social consequences of a diagnosis.

If this trend of infection continues, the rising number of productive age population can become a liability for development. Combating TB requires several policies targeted at different levels of society. First, the government must increase funding to fight against TB as a means to reduce the financial burden of infection on family, society, and government. Secondly, the government should combine TB prevention efforts along with the monitoring of HIV/AIDS. Thirdly, the government should address the relationship between education and poverty on one side and TB on the other. Finally, on the micro level, support groups and community campaigns need to be developed to increase TB education and decrease the associated stigma.

Health Among Children

Continued investment in health care in the past has resulted in a reduction of infant and under-five mortality rates by half since 1990.This investment should be continued to ensure a better life and higher survival rates. While mortality rates are improving, many children in Indonesia still die every year before celebrating their fifth birthday. More than one-third of under-5 deaths occur in the first month after birth and can be attributed to complications from premature birth, still births and severe infections including pneumonia, meningitis and septicaemia. For those who survive beyond the first month, diarrhoeal disease is responsible for nearly a quarter of under-5 deaths and pneumonia accounts for another 17 percent. Progress in reducing maternal mortality has been even slower with many women still losing their life every year due to complications in pregnancy and childbirth.

Serious challenges remain to children's early development, such as the prevalence of malnutrition and stunting, or being below average height for one's age. Indonesia managed to successfully reduce the percentage of undernourished children below 5 years old from 28.0 percent in 2007, to 17.9 in 2010. Yet, malnutrition in Indonesia remains a serious problem. The presence of malnutrition and undernutrition in a population are not only an indication of health, but also an important indication of food insecurity.

Nutrition intake trends highlightareas that need further improvement. As seen in Figure 3.23 many children under-5 years of age in the eastern provinces of Indonesia suffer from under nutrition at two levels of severity (i.e., severe and lack of nutrition), while the lowest prevalence of under nutrition is also seen in a few provinces such as West Java and Jakarta. West Kalimantan and Central Kalimantan had the highest percentage of under nutrition. Meanwhile, severe malnutrition is found in West Nusa Tenggara and Gorontalo with more than 10 percent of children under 5 suffering from malnutrition (Table 3.6).

FIGURE 3-23

Percentage of Under Nutrition for Children Under Five Years Old by Province, 2010

Source : Drawn from Table 3.13 by Narwawi Pramudhiarta.

Nutritional status is traditionally defined in anthropometric terms such as: weight-for-age, height-for-age, weight-for-height. Weight-for-age reflects the indication of nutritional status in general, but it does not reflect whether nutritional status is acute or chronic. Whether status is acute or chronic can be further deduced by height-for-age and weight-for-height measurements.Low weight-for-age can be because of diarrhoea or an infection (acute) or because of low height (chronic). Based on weight-for-age, the percentage of undernourished children under-5 improved as numbers declined from 18.4 percent in 2007 to 17.9 percent in 2010 (13.0 percent experiencingunder nutrition (*gizi kurang*), 4.9 percent with severe under nutrition (*gizi buruk*)). In addition, 5.8 percent of children under five were over nutrition. Thus, the percentage of malnourished children under five is relatively significant; particularly giventhe MDG targetingof under-nutrition levelsat 15.5 percent by 2015. As of 2010, onlynine provinces reached this MDG target including: North Sulawesi (10.6 percent), Bali (10.9) and Jakarta (11.3). In stark contrast, provinces of West Nusa Tenggara (30.5), East Nusa Tenggara (29.4) and West Kalimantan (29.2) fell way below the MGD target of 15.5.

TABLE 3-6

Nutritional Status of Children Under Five Years Old by Province, 2005-2010

Table ***Nutritional Status of Children Under Five Years Old by Province, 2005-2010***

Province	Gizi Buruk *Severe Nourished*			Gizi Kurang *Lack Nourished*			Gizi Normal *Moderate Nourished*			Gizi Lebih *Well Nourished*		
	2005	2007[1]	2010[1]	2005	2007[1]	2010[1]	2005	2007[1]	2010[1]	2005	2007[1]	2010[1]
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Aceh	-	10.70	7.10	-	15.80	16.60	-	69.20	72.10	-	4.20	4.20
Sumatera Utara	10.45	8.40	7.80	18.20	14.30	13.50	67.79	72.70	71.10	3.56	4.50	7.50
Sumatera Barat	10.81	5.90	2.80	19.63	14.30	14.40	66.88	77.00	81.30	2.68	2.80	1.60
Riau	9.27	7.50	4.80	16.54	13.90	11.40	67.52	73.30	75.20	6.67	5.30	8.60
Jambi	5.54	6.30	5.40	18.72	12.60	14.30	71.33	75.80	76.30	4.41	5.30	4.10
Sumatera Selatan	8.54	6.50	5.50	17.52	11.70	14.40	69.02	75.00	74.50	4.92	6.70	5.60
Bengkulu	6.97	4.80	4.30	19.59	11.90	11.00	69.91	77.20	73.70	3.53	6.00	10.90
Lampung	7.24	5.70	3.50	16.72	11.80	10.00	72.33	78.30	79.80	3.71	4.20	6.80
Kep. Bangka Belitung	8.70	4.60	3.20	17.04	13.70	11.70	69.07	76.40	80.60	5.19	5.40	4.50
Kepulauan Riau	-	3.00	4.30	-	9.40	9.80	-	81.50	81.30	-	6.10	4.60
DKI Jakarta	7.30	2.90	2.60	15.03	10.00	8.70	72.87	80.60	77.70	4.80	6.50	11.10
Jawa Barat	5.77	3.70	3.10	16.23	11.30	9.90	74.82	81.50	81.60	3.19	3.50	5.40
Jawa Tengah	5.84	4.00	3.30	18.13	12.00	12.40	73.34	80.40	78.10	2.69	3.60	6.20
DI Yogyakarta	4.08	2.40	1.40	10.97	8.50	9.90	81.76	85.00	81.50	3.19	4.00	7.30
Jawa Timur	5.67	4.80	4.80	18.09	12.60	12.30	73.04	78.00	75.30	3.20	4.50	7.60
Banten	6.98	4.40	4.80	19.19	12.20	13.70	69.49	79.90	77.50	4.33	3.40	4.00
Bali	5.10	3.20	1.70	15.41	8.20	9.20	75.73	83.90	81.00	3.76	4.70	8.00
Nusa Tenggara Barat	8.44	8.10	10.60	24.95	16.70	19.90	64.42	71.40	66.90	2.19	3.70	2.60
Nusa Tenggara Timur	13.04	9.40	9.00	28.03	24.20	20.40	57.25	64.40	67.50	1.68	2.00	3.10
Kalimantan Barat	11.56	8.50	9.50	21.16	14.00	19.70	63.61	72.50	67.00	3.67	5.00	3.90
Kalimantan Tengah	10.19	8.10	5.30	17.18	16.10	22.30	68.54	72.10	69.40	4.08	3.60	2.90
Kalimantan Selatan	11.29	8.40	6.00	24.48	18.20	16.80	61.94	70.40	73.10	2.29	3.00	4.00
Kalimantan Timur	7.59	6.20	4.40	18.33	13.10	12.70	69.55	75.30	75.90	4.53	5.40	7.00
Sulawesi Utara	-	4.30	3.80	-	11.50	6.80	-	80.70	84.30	-	3.60	5.10
Sulawesi Tengah	10.36	8.90	7.90	20.96	18.70	18.60	66.50	69.40	69.10	2.18	3.00	4.40
Sulawesi Selatan	8.65	5.10	6.40	21.51	12.50	18.60	66.51	73.10	72.20	3.33	9.30	2.80
Sulawesi Tenggara	10.04	6.80	6.50	19.34	15.90	16.30	67.69	73.60	66.90	2.93	3.60	10.20
Gorontalo	15.41	8.20	11.20	26.07	17.20	15.30	56.44	71.30	69.40	2.07	3.30	4.10
Sulawesi Barat	-	10.00	7.60	-	15.40	12.90	-	72.10	74.90	-	2.40	4.70
Maluku	15.19	9.30	8.40	18.47	18.50	17.80	62.51	67.30	70.50	3.83	4.90	3.40
Maluku Utara	10.24	6.70	5.70	17.06	16.10	17.90	68.90	74.30	73.20	3.80	3.00	3.20
Papua Barat	-	6.80	9.10	-	16.40	17.40	-	74.20	67.30	-	2.70	6.20
Papua	13.75	6.60	6.30	17.46	14.60	10.00	63.93	73.40	78.40	4.86	5.30	5.30
Indonesia	**8.80**	**5.40**	**4.90**	**19.24**	**13.00**	**13.00**	**68.48**	**77.20**	**76.20**	**3.48**	**4.30**	**5.80**

Catatan: [1]Sumber dari Riset Kesehatan Dasar, Kementerian Kesehatan

Note: [1] Source from Basic Health Research, Ministry of Health

Sumber: Survey Konsumi Garam Yodium, BPS

Source: Iodized Salt Surveys, BPS-Statistics Indonesia

Meanwhile, a low height-for-age (HFA) reflects chronic malnutrition due to poverty, unhealthy lifestyle, or bad food habits since birth. In 2010, more than one third (35 percent) of children under five had low HFA. Since 2007, there has been slow improvement as the HFA declined from 36.8 percent in 2007 to 35.6 percent in 2010. The lowest percentages of HFA was found in Yogyakarta (22.5%), Jakarta (26.6%) and Riau Archipelago (26.9%), while the highest percentagesof HFA were found in East Nusa Tenggara (58.4%), West Papua (49.2%) and West Nusa Tenggara (48.3%).

Another measurement is the weight-for-height (WFH) which reflects acute conditionsto certain diseases affecting children and a low intake of nutrition. In 2010, 13.3% of children under five *wasting* consisted of 7.3% wasting, and 6.0% severe wasting. In three years, this number only declined slightly from 13.6 percent in 2000 to 13.3 percent in 2010. The lowest percentage was found in Bangka Belitung(7.5%), Riau Archipelago (8.0%) and West Sumatera (8.2%), yetthese low percentages were still much higher than the WHO standard. The largest WFH percentages were found in Jambi (20,0%), Bengkulu (17.8%) and North Maluku (17.7%).

One third of Indonesian children are stunted, anirreversible condition that can permanently impede mental and physical development due to chronic nutritional deficiencies during the first thousand days of a child's life.However, stunting is not just a matter of inadequate food intake. Strong correlations exist between stunting and poor water and sanitation in rural and urban environments. Poor sanitation leads to frequent episodes of diarrhoeal disease in children resulting in reduced nutritional absorption which contributes to stunting, cognitive setbacks, lower school performance, and lower economic earnings later in life. Stunting affects 37 percent of children under five, while 18 percent of children below the age of five are underweight. Tackling stunting requires a broad-based approach of improving health, sanitation and education. Therefore, we need to provide the youngest generation with food security -affordable, available and safe food at all times. We also need to teach mothers the importance of feeding children a balanced diet. All of these small steps can lead to big changes in the lives of communities and the children who will be future parents.

Breastfeeding in another important health issue. Many infants are left unprotected against disease because of low levels of breastfeeding.Less than half (or 42 percent) of Indonesian babies are being exclusively breastfed for the first six months of life (Statistics Indonesia (Badan Pusat Statistik—BPS), National Population and Family Planning Board (BKKBN), and Kementerian Kesehatan (Kemenkes—MOH), and ICF International. 2013). Moreover, in 2012 only 41 percent of children aged between 6 and 23 months were fed according to recommended practices.In 2003, the Indonesian government changed the recommended duration ofexclusive breastfeeding from four to six months along with suggestions that solid food should only be given after 6 months with breastfeeding to continue well into the secondyear of life. Moving forward, campaigns for exclusive breastfeeding for six months need to be enhanced for the health of the upcoming generation. In addition, it has been found breastfeeding reduces a mother's chance of getting breast cancer. The first breast milk contains colostrum, which ishighly nutritious and has antibodies that protect the newborns from diseases. Early initiation of breastfeedingalso fosters bonding between mother and child. Over the long-term, a breastfeeding mother is likely to extendthe length of her birth intervals because of the suppressive effect that breastfeeding has on postpartumamenorrhea. Longer birth intervals allows a mother's body to recover from the physical depletion associatedwith pregnancy.

Health of the Youth

Promoting healthy practices amongyouth, and taking steps to better protect them from health risks, is critical to the future of the labor force, economy, and society. Teenage pregancy rates serve as an important indicator to illustrate a lack of universal access to reproductive health. Moreover, the right to health for all young people is enshrined in international legal instruments such as the Committee of the Convention on the Rights of the Child (CRC)in which the special health, development needs and rights of the youth were recognized. Other international agreements supporting the rights of youth include the Convention on the Elimination of Discrimination Against Women (CEDAW) and the Right to Health.

The vast majority of adolescent births occur in developing countries. Adolescents are more at risk of dying from pregnancy-related causes than older women. The younger the adolescent, the greater the risk. In 2012, Indonesian age specific fertility rates (ASFR) show that 48 babies born per 1,000 were to young mothers aged 15-19, with a significant urban-rural difference. The ASFR in rural areas for age 15-19 was 69; a rate more than double that of urban areas at 32.

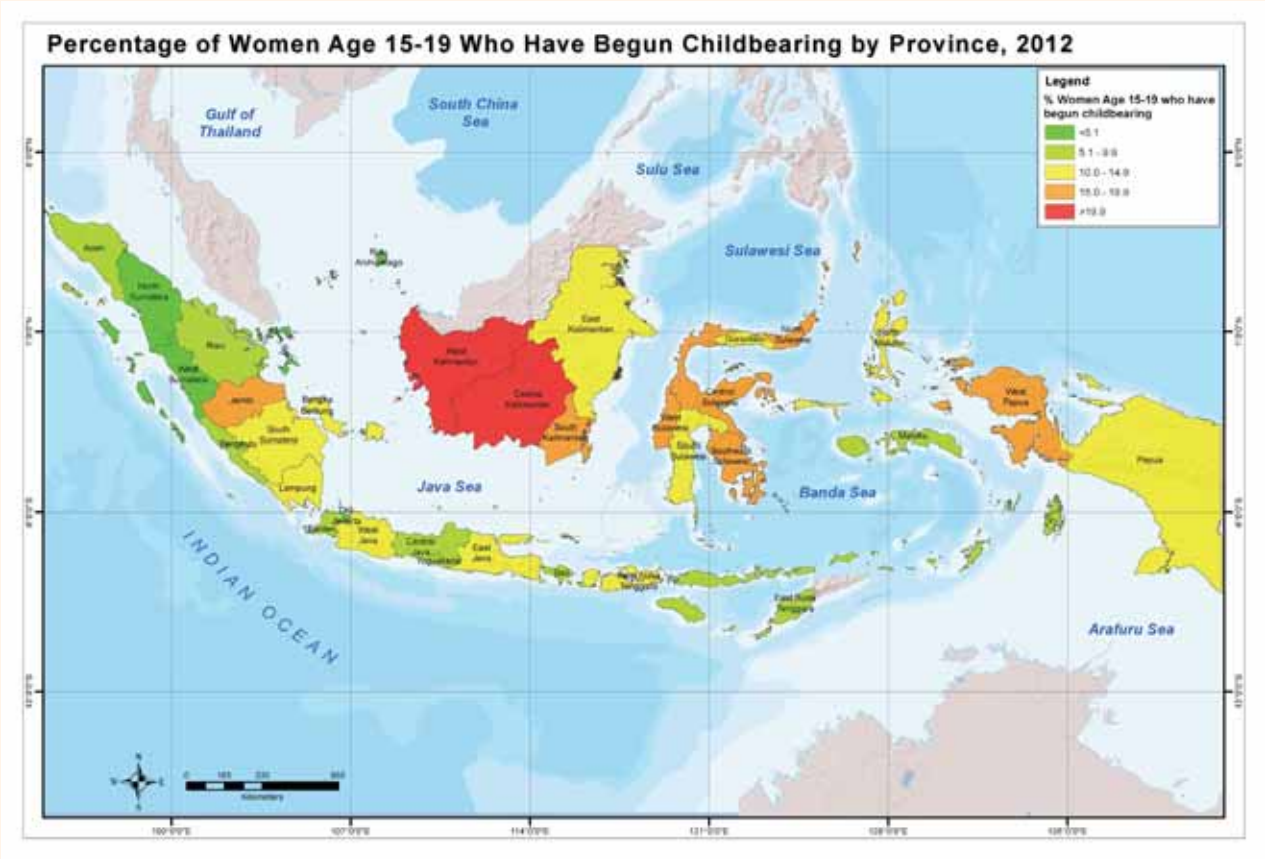
The issue of adolescent fertility is important for health and social reasons, particularly due to itsassociation with higher morbidity and mortality for both mother and child. Teenage mothers, especiallythose under the ofage 18, are more likely to experience adverse pregnancy outcomes and maternity-related mortalitythan more mature women. In addition, early childbearing limits a teenager's ability to pursue educationalopportunities thus limiting access to job opportunities.The 2012 IDHS findings show that 10 percent of adolescents have startedchildbearing of which 7 percent have had a live birth and 3 percent are currently pregnant with their first child.

Indonesia's rural teenagers are more likely than their urban counterparts to have started childbearing (13percent compared with 6 percent). A negative relationship exists between early childbearing and education with 16 percent of teenagers with no education already childbearing compared to 1 percent of those withmore than a secondary education. By wealth status, the proportion of teenagers who have begun childbearing also varies from a high 17 percent among those living in households in the lowest wealth quintile to a low 3percent among those in the highest quintile. Having babies in these early ages may prevent young parents (especially the mother) from developing their careers. Subsequently, the children of these mothers are less likely to live in environments that are conducive to making a better future. Therefore, the poor and less educated will be trapped in a poverty circle if the pattern is not broken.

Figure 3.24 shows a provincial differential in teenage pregnancy. Suprisingly, the figure shows that the capital of Jakarta does not have the highest teenage pregnancy and instead the provinces of West Kalimantan and Central Kalimantan have the largest teenage pregnancy rates accounting for more than 20 percent of teens aged 15-19. Other provinces in Sulawesi also havea relatively high percentage of teenage mothers. Table 3.7 provides more detailed evidence on teenage mothers among provinces.

FIGURE 3-24

Percentage of Women Aged 15-19 Who Have Begun Childbearing by Province, 2012



Source: Drawn from Table 3.14 by Narwawi Pramudhiarta.

In addition, teenage pregnancy can lead to child marriage. Child marriage is a harmful practice as it often prevents girlsthe opportunity to study leaving them more likely to remain poor. Being married young not only curbs a girl's right to education, it also endangers their health fromearly pregnancy and childbirth complications. Childbirth complications are the leading cause of death among girls aged 15 to 19. As such, investing in girls is a catalyst for changing Indonesia, and the world. Instead, Indonesia can be part of GenRe (*Generasi Berencana*) or the informed generation on sexual and reproductive health information. One major step in this direction is to end child marriage by allowing girls to be girls and not brides.

Early pregnancies can be curbed through formulation and enforcement of lawsspecifying a minimum age of marriage, community mobilization supporting these laws, and better access to contraceptive information and services. Adolescents who do become pregnant should be provided with quality antenatal care and skilled birth attendance. Where permitted by law, those adolescents who opt to terminate their pregnancies should have access to a safe abortion.

TABLE 3-7

Teenage pregnancy and Motherhood

Percentage of women age 15-19 who have had a live birth or who are pregnant with their first child, and percentage who have begun childbearing, by province, Indonesia 2012

Province	Percentage of women age 15-19 who: Have had a live birth	Are pregnant with first child	Percentage who have begun childbearing	Number of women
Sumatera				
Aceh	3,0	2,2	5,2	142
North Sumatera	3,1	1,6	4,7	455
West Sumatera	1,4	1,9	3,3	145
Riau	4,4	1,5	5,8	144
Jambi	12,6	3,8	16,4	87
South Sumatera	9,1	2,8	11,9	190
Bengkulu	4,7	4,1	8,8	49
Lampung	8,1	3,8	11,9	220
Bangka Belitung	9,7	1,9	11,6	37
Riau Islands	4,4	0,4	4,8	36
Java				
DKI Jakarta	2,4	1,6	4,1	278
West Java	7,6	3,6	11,2	1260
Central Java	4,7	1,1	5,7	943
DI Yogyakarta	4,7	1,4	6,1	96
East Java	8,0	2,1	10,1	931
Banten	6,2	1,3	7,5	358
Bali and Nusa Tenggara				
Bali and Nusa Tengga	6,8	2,1	8,9	106
West Nusa Tenggara	8,4	3,8	12,3	152
East Nusa Tenggara	4,1	2,2	6,3	159
Kalimantan				
West Kalimantan	19,8	3,1	22,9	114
Central Kalimantan	16,7	3,8	20,5	59
South Kalimantan	12,7	3,7	16,4	114
East Kalimantan	9,3	3,7	13,0	100
Sulawesi				
North Sulawesi	10,8	4,2	15,0	71
Central Sulawesi	14,5	5,2	19,7	79
South Sulawesi	6,7	3,9	10,6	274
Southeast Sulawesi	10,7	5,1	15,8	62
Gorontalo	8,8	4,9	13,6	35
West Sulawesi	15,5	1,6	17,1	33
Maluku and Papua				
Maluku	5,4	2,6	7,9	47
North Maluku	9,2	2,6	11,8	35
West Papua	13,0	4,3	17,3	22
Papua	11,8	2,5	14,3	93
Total	7,0	2,5	9,5	6927

Source :*Indonesia Demographic and Health Survey 2012*. Jakarta, Indonesia: BPS, BKKBN, Kemenkes, and ICF International. (IDHS 2012)

Health of Working Age Population

Based on Body Mass Index (BMI), the nutritional status of the Indonesian population shows that 11.7 percent of those aged 18 years old and over is dominated by obesity (BMI above 30) and 10 percent are considered overweight. In total, this leaves 21.7 percent of this population group overweight. The female population is more overweight at 26.9 percent compared to 16.3 percent among the male population. The highest rates are found among the age group 35-39 regardless of sex. At this age group, one third of the female population is overweight compared to one fifth of the male population.

In 2010, the province with the lowest rates of "overweight" is East Nusa Tenggara (13.0 percent), followed by Southeast Sulawesi (16.3 percent), and West Nusa Tenggara (16.8 percent). Those with high rates of overweight are North Sulawesi (37.1 percent), Riau Archipelago (30.8 percent), and East Kalimantan (29.4 percent). The highest percentages of normal weight werefound in Southeast Sulawesi (72.8 percent), Lampung (70.7 percent), and Riau (69.4 percent). Data also shows that overweight is also more likely to be found in urban areas and among those with higher income.

The relatively high rates of overweight among those above 18 years old is of great concern since they make up the working age population. Being overweight can reduce productivity due a deterioration in health (Ministry of Health 2013). Given the large number of working age population, the overweight among this population can be a burden on the economy rather than an asset.

Beside BMI, the working age population faces other health challenges. Mothers are at risk from preventable deaths in pregnancy and childbirth. Currently, more than onequarter of maternal deaths are caused by haemorrhaging and a similar proportion due to eclampsia. While the number of women receiving ante-natal care has increased in recent years, more than half of deliveries still take place at home without specialist facilities to deal with complications. These risks can be reduced through improvements inthe standard of care provided by both public and private sector facilities and amongst health care workers.

Health for Older Persons

Forms of illness common to elderly Indonesians include cataract, anemia, periodontal disturbance, deafness, osteoarthritis and hypertension (Eliana et al. 2005). Despite the importance of knowing the risk factors for cardiovascular diseases, the available data on these diseasesis limited.

In Indonesia, anemia is a risk factor for functional and cognitive deterioration. It can be an underlying conditionbehind an elderly person's fall and further increases the risk ofa hip fracture among older persons (Shebubakar 2009). Juguan, Lukito and Schultink (1999) found that older persons in urban Indonesia not only suffered from anemia, but also from deficiencies of thiamin and Vitamin B-12. Furthermore, Kurniawan (2011) argued that anemia among older persons is a disease that should never be considered part of a normal aging process because it can traced to chronic diseases or iron deficiencies. For instance, iron deficiency anemia (IDA) is normally related to gastrointestinal disorder.

Based on three rounds of the IFLS, Witoelar, Strauss and Sikoki (2009) reveal a decreasing trend in the proportion of elderly men and women with blood hemoglobin

levels lower than the threshold. For elderly men, the proportion below the threshold declined from 40.6 in 1997 to 27.12 in 2007. For elderly women,there was decrease from 41.9 to 33.8 during the same period of 1997 to 2007. This promising trend shows an improvement in one dimension of health among elderlyIndonesians.

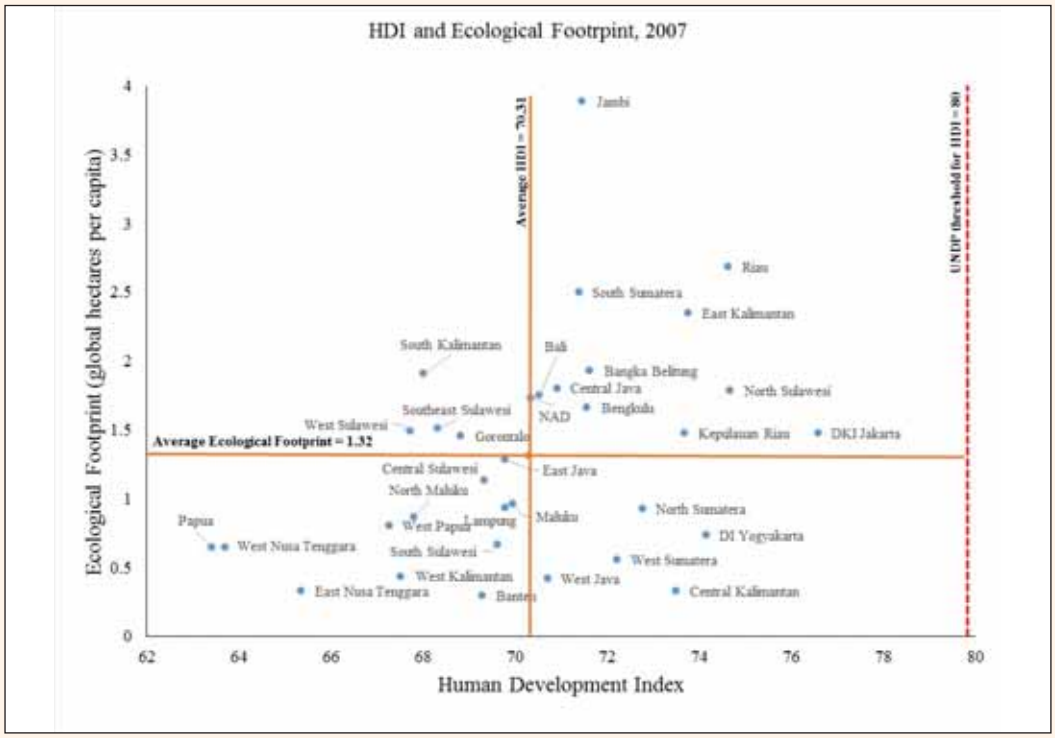
Peterson (2003) reported that the percentage of edentulous, or toothlessness, among Indonesians aged 65 years was 24 percent higher than in India (19 percent) and China (11 percent). However, this percentage was much lower than among British (46 percent) and Canadian (58 percent) older persons. In general, tobacco and alcohol use arethe key risks of oral health problems, particularly in tooth loss. In Indonesia, the risk of tooth loss from tobacco use is relatively high compared to that from alcohol consumption possibly due to religious reasons. Overall, tooth loss is an oral health problem among Indonesian older persons.

3.3 ENVIRONMENTAL DIMENSION

As stated in the beginning of this book, Indonesia's development path has emphasized economic development over social and environmental development. Several regions, mostly natural resource-rich provinces, have improved their human development yet failed to minimize their ecological footprint as shown in Figure 3.25. For example, Jambi is one of the resource rich provinces with a slightly above average HDI,however, it also has a high ecological footprint suggesting the province's development had a negative impact on the environment. Ifregions, such as Jambi, continue to follow this unsustainable development pathway, Indonesia's goals to achieve sustainable development will be difficult to achieve. The following section looks at the importance of achieving water, air, food, and energy security as part of Indonesia's sustainable development goals.

FIGURE 3-25

HDI and Ecological Footprint of Provinces, 2007



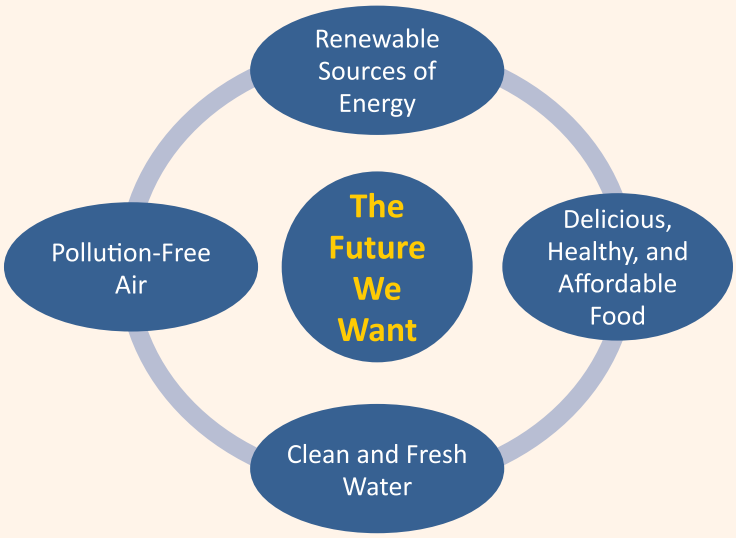
Source: Central Bureau of Statistics and Ministry of Public Works Ecological Footprint Report (2010)

3.3.1 Linkages between Air, Water, Food, and Energy

As illustrated below in Figure 3.26, air, water, food, and energy are directly linked to sustainable development. The interconnectedness of these four elements make securing their continuation vital to obtaining the three aspects of sustainable development. First, energy is needed to modernize the economy. Without energy, a people-centered, equitable, triple track path to sustainable development is difficult to achieve. However, as discussed in Kua (2007), the global use of energy will still rely mostly on oil, gas, and coal until 2030. In addition, the global demand for energy will continue to increase due to rising economic growth and living standards in many countries in the world. This increased use of oil, gas, and coal will continue to exert pressure on the environment and likely to contribute to an increase in CO_2 emissions.

FIGURE 3-26

Linkage Between Air, Water, Food, and Energy



Source: Authors' Illustration

Ultimately, producing energy comes at a cost. Some energy comes from non-renewable resources and over-exploitation today will deplete the resources for future use. Producing energy is often accompanied by harmful impacts on the environment that reduce the welfare of people. For example, air and water can be polluted during the energy production process which can jeopardize efforts to provide pollution-free air and safe, clean water. In addition, energy may also compete with food sources and reduce the ability to produce healthy and nutrious food for all. An example of energy production competing with food sources is in the production of large-scale biofuel. Biofuel requires land and this land could otherwise be used for food production and to enhance food security. Therefore, it is important to promote the use of renewable energy sources, such solar, wind, and water, which are more environmentally friendly sources of energy. However, environmentally friendly energy must also be available at affordable prices to ensure equity of access and widespread use.

Some food production processes can also be environmentally harmful. For instance, raising livestock contributes to methane emissions, which in turn, contributes to global warming. As such, animal husbandry industries are major emitters of methane (CH_4) and ammonia (NH_3), a precursor of fine particulate matter ($PM_{2.5}$) which is considered a public health threat. Studies show that $PM_{2.5}$ can result in premature mortality and morbidity, especially for the very young and older populations (Shih et al. 2008).

Water is essential for food production, but more importantly, is a basic need for people to live a healthy lifestyle. Across Indonesia, access to clean and safe water has been increasing with more than 60 percent of Indonesia's population having access to clean water. Nevertheless, many households, particularly in certain regions of Indonesia, still lack access to water. To fully achieve sustainable development, it is important to ensure all Indonesians have access to clean water. Water security also influences food and energy security. At the same time, energy is critical to water security as it is needed to to use, move and treat water. Studies show that as income rises, demand for meat and dairy also increase, along with increases in the energy needed to produce these products. Large amounts of water and energy are required to produce processed foods and beverages to meet consumer demands.

However, by changing our consumption habits and lifestyles away from consuming a resource-intensive diet (such as meat) to a more plant-based diet, we could help mitigate global warming and enjoy better health at the same time. As consumers, knowing where our food came from and how is it made are increasingly important to conserving water, energy and other resources.

Even more than clean water, the absence of clean air threatens all living creatures, including human beings. Without security of air, security of food and water will also be threatened. Therefore, the environmental dimension of The Future We Want envisions the four environmental factors (air, water, food, energy) as interconnected. As such, sustainable development aims to provide people with the easy (and affordable) access to energy produced from renewable resources; nutrious and healthy food; safe and clean water; and pollution-free air.

Financialization of Natural Resources

In recent years, there is a rapidly increasing trend toward 'financialization' of commodities for speculative purposes, including natural resources. Financialization, as argued by Tricarico and Amicucci is when the price of a commodity fluctuates without necessarily a change in the value of that commodity. Financialization of a commodity from real sectors makes the commodity a financial instrument that is bought and sold in the ordinary market and subject to speculative behaviour. As such, people buy the commodity for speculative purposes in order to gain high returns rather than for consumption purposes.

Financialization of the economy has been spreading to an increasing number of commodities including energy. As discussed by Tricarico and Amicucci (2011), financialization has invaded almost all commodity markets including social systems (e.g., pensions, health, education, and housing) and natural resources. Can you imagine if consumption of fresh air becomes a commodity that we have to pay for in order to consume?Already today, air has been commoditized as we may see people buying bottles containing pollution-free air.[15] Even worse stillwould be if

15 http://www.dailymail.co.uk/news/article-2271690/Bottled-AIR-Chinese-multimillionaire-sells-EIGHT-MILLION-cans-fresh-air-TEN-DAYS-pollution-levels-climb-record-high.html and http://www.chinabusinessreview.com/clean-air-for-

consumption of fresh air becomes an investment product that was used as a means for speculation by players in the financial market.

At the same time, Tricarico and Amicucci notice that the global economy has changed partly because of the rising global competition to control natural resources. This competition is not merely attributed to fast industrialization and emerging economies with limited natural resources. Instead, they claim itstems from neo-geopolitical dynamics and the desire to control the flow of natural resources as a means to direct future markets, political relations and economic supremacy.In other words, the financialization of natural resources created the conditions whereby natural resources become an important global political commodity.

Among natural resources, we already see the financialization of energy.This means energy is no longer only bought and sold in the conventional energy market, butthat it has become a financial instrument that is bought and sold in the financial market as a strategic global political commodity. Financialization of food is also visible, especially in large international agribusinesses. Food is essential for human survival, as such, healthy food will become a financial and political commodity, in addition to an economic commodity. Like in the energy sector, people will compete for healthy food for their survival, profit, and political bargaining. The financialization of food translates its physical form into the abstract where it becomes a highly complex agricultural commodity derivative (Clapp 2013).However, financialization of water is still at the beginning stages after being conceptualized by strong financial speculators. Yet, drinking water has already been commoditized at some level in the form of buying and selling bottled water. Clean water, as well, can become scarce and turn into another financial and political commodity. Furthermore, competition for clean water is heightened because of its critical role in the survival of a nation. Speculation and political bargaining will take advantage of the crisis in clean water. In the near future, it is not impossible that air too will become a financial instrument, and later, global political commodity. It is clear that those who can control clean air will survive, and should they be inclined, they could control other countries for a handsome profit.

People all over the world will compete for scarce energy, food, water, and air. Natural resources will not only be an economic commodity, but also financial and political commodities. As discussed in Marshall and Jaggers (2012), this is already happening to some extent in developed countries. For example, the 2008/2009 financial crisis resulted in huge loss including loss of pension funds. To regain the loss, financial managers created new financial instruments derived from natural resources, including clean air and weather forecasts on agricultural products. As demonstrated, this trend of financialization of natural resources is clearly detrimental to the achievement of a triple track sustainable development pathway. Instead, Indonesia should join other countries to work together in preventingthe financialization of natural resources.

Free Trade and Self-Sufficiency

Indonesia is a country with a large population and growing income levels resulting ina potentially larger domestic market. Indonesia is also a country endowed with abundant natural resources. Therefore, unlike smaller and resource-poor countries, Indonesia's need for free international trade is not as large. As such, Indonesia should participate in free trade as long as it increases the welfare of current and

sale-in-china/

future generations of Indonesians. Moving forward, Indonesia should aim to avoidmistakes of the past, such as exporting lots of oil, so that Indonesia today is a net importer of oil.

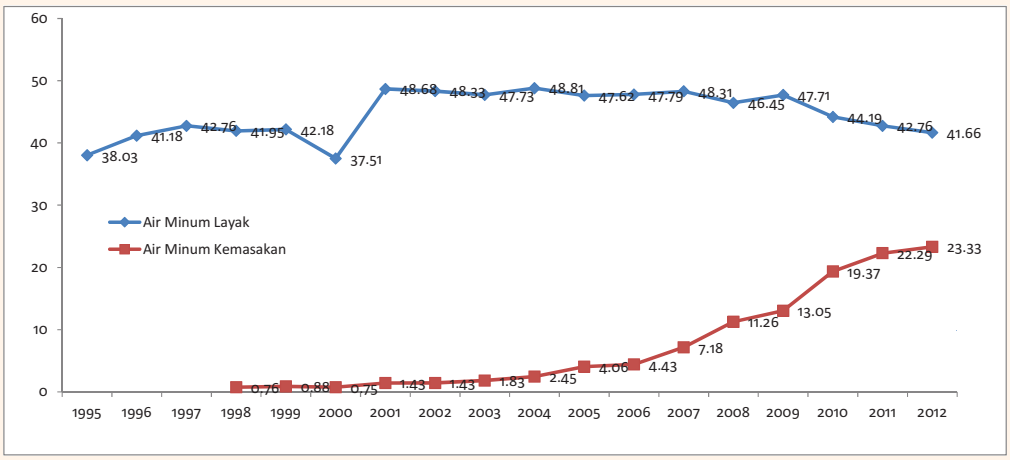
Indonesia has the capacity to become self-sufficient in air, water, food, and energy security. Once the domestic need has been fulfilled and everybody has access to affordable healthy and nutritious food, any surplus can then be exported. At the micro level, social protection is needed to ensure security at the household level. But who should guarantee the security of green energy, healthy and delicious food, safe fresh water, and pollution-free air for households? Following the framework of a continuum of social protection applied in Ananta(2012), there are four possibilities to achieve this goal. First, individuals are responsible to prepare everything to protect themselves from the unexpected and ensure they can afford to buy or to get adequate amounts of energy, food, water, and air. A second option, is for households to get assistance from spouses, parents, relatives, and friends (i.e. their own social support system). The third channel is to receive assistance through society, e.g., social organizations, charities, etc. The fourth alternative is for the government to step in. The decision on who plays a dominant role or the relative contribution of each group is a politically contested question[16].

3.3.2 Safe Fresh Water

Barbier (2010)[17] states that water security has never been a constraint to economic growth for most countries in the world. However, water security has been an urgent issue of poverty, especially in rural and poor areas. The poorest people are often those who do not have access to clean water and sanitation, or if they do have access they have to pay higher prices to get the clean water. In other words, water security is an urgent concern for sustainable development requiring the provision of safe drinking water and improvements in sanitation a target of Indonesia's development goals by 2030.

FIGURE 3-27

Percentage of Households with Access to CleanWater and Packaged Water: Indonesia, 1995-2012



Source: Ministry of Health(2013)

16 Additional reading on the role of social protection for food security at the household level in CLMV, please read Vo Tri Tanh (2013).

17 Publication by United Nations Environment Programme (UNEP)

Provision of safe and affordable fresh water and improvements in sanitation are often in competition with commercial drinking water and construction of buildings. Water has already been commoditized, so that it is no longer free or affordable. Businesses can take cheap and free clean water to be packaged and sold to those who have money, typically in urban areas. As such, the trend toward commodification of clean water is here. Figure 3.27 illustrateshow the percentage of households consuming packaged water is increasing at an accelerated rate, most likely due to growing incomes and health concerns. This trendopens the door for the private sector to play an increasing role in meeting the clean water needs of citizens. However, the government should ensure everyone has access to the provision of safe, affordable and clean drinking water and improvements in sanitation.

More importantly, producing packaged or bottled water takes a significant amount of resources and goes against sustainable development efforts. According to the Pacific Institute (2007), three liters of water are needed to make one liter of bottled water plus 3.4 megajoules of energy to produce a typical one liter plastic bottle, cap and packaging. Producing one ton of plastic bottles produces three tons of carbon dioxide (CO_2), in addition to the energy required for the transportation and recycling of bottle water which is equivalent to filling a plastic bottle a quarter full with oil.

Water is said to become the new oil, or even larger, as it will soon replace oil as the world's most expensive and critical natural resource. Moreover, scarcity of water will lead to far worse social, economic, and political reprecussions than that of oil, or any other energy scarcity. Whereas oil can be substituted with other sources, water is indispensable, essential for human survival and has no substitute. Just as the twentieth century saw global conflict over the competition over oil; the twenty-first century may be defined by competition for access to fresh water and may produce even more dire global and regional conflicts. The interdependence among scarcities of water, energy and air, alongside the conditions of climate change, will define civilization in the twenty-first century (Solomon, 2010).

According to the United Nations (2014), to achieve water security by 2030 Indonesia should aim for five targets:(1) Universal access to safe drinking water, sanitation and hygiene, as well as improvements in water quality and enhancement of service standards; (2) More efficient and equitable use of water resources; (3)Create robust and effective governance for water resources; (4) Improve quality of water and management of wastewater with consideration to environmental limits; (5)Reduce risk of water-related disasters, particularly in protection of vulnerable groups and reduction of economic losses.

TABLE 3-8

Percentage of Households with Clean Water by Province: Indonesia, 2007-2012

Province	2007	2008	2009	2010	2011	2012
Aceh	38.44	41.23	48.61	53.88	59.11	58.82
North Sumatra	50.89	52.27	56.52	60.38	62.09	65.56
West Sumatera	49.44	49.51	53.55	56.72	59.10	64.53
Riau	35.06	41.02	43.50	45.91	51.16	56.75
Jambi	43.02	46.89	46.83	51.78	53.25	56.82
South Sumatera	46.97	48.23	51.54	52.50	57.37	58.13
Bengkulu	29.82	31.31	37.97	38.18	40.19	42.99
Lampung	41.48	45.01	45.20	45.94	50.48	49.70
Bangka Belitung	49.01	54.03	60.47	67.77	74.14	76.38
Riau Archipelago	71.27	56.82	61.50	79.82	83.57	84.15
Jakarta	80.36	87.77	87.86	90.64	91.54	93.50
West Java	46.30	50.41	55.62	58.82	59.52	61.25
Central Java	57.14	58.09	61.93	63.98	66.26	66.59
Yogyakarta	68.30	69.61	70.65	75.39	75.39	74.15
East Java	63.44	65.16	67.08	68.16	70.06	70.41
Banten	46.14	53.89	53.94	58.89	62.64	63.99
Bali	73.54	74.57	80.38	78.37	80.06	84.66
West Nusa Tenggara	51.11	50.00	53.01	56.89	55.04	56.83
East Nusa Tenggara	43.33	45.13	45.34	48.99	50.25	51.27
West Kalimantan	18.09	19.44	19.28	22.90	23.92	25.46
Central Kalimantan	32.36	35.46	38.11	43.39	45.88	50.67
South Kalimantan	54.39	54.00	55.45	56.77	60.27	61.80
East Kalimantan	65.51	67.51	69.47	73.21	75.21	78.97
North Sulawesi	56.36	58.47	62.50	63.60	64.84	65.87
Central Sulawesi	41.14	45.74	49.64	45.22	51.61	55.49
South Sulawesi	51.44	53.97	58.06	61.20	61.98	65.53
Southeast Sulawesi	53.29	56.04	59.31	56.09	61.59	62.88
Gorontalo	43.96	41.29	48.46	47.97	50.88	54.02
West Sulawesi	na	44.91	47.68	43.45	39.33	42.60
Maluku	54.13	46.92	55.68	59.33	54.02	54.30
North Maluku	39.93	41.82	44.56	54.19	48.86	50.76
West Papua	46.02	40.00	42.72	54.81	50.74	57.62
Papua	32.21	27.83	31.39	30.99	27.45	30.40
Indonesia	52.92	55.07	58.18	60.87	62.65	64.16

Note: Clean water includes packaged water, refill water, pipe, as well as artesian well/pump, protected well, and protected spring that the distance to toilet hole more than 10 m. This is calculated from a series of National Socio Economic Surveys.

Source : CBS

From 2007 to 2012, there is an increasing trend in the percentage of households with clean water across all provinces in Indonesia (Table 3.8). Coverage as a whole has increased from 52.9 percent in 2007 to 64.2 percent in 2012 but withnone of the provinces having full coverage of clean water. The largest percentage of households with clean water was found in Jakarta at 93.5 percent in 2012, and the lowest was found in West Kalimantan (25.5 percent). For the case of West Kalimantan, despite the low ranking this percentage actually increased quite significantly from 2007 rates of 18.1 percent. As shown inTable 3.9, majority of households in West Kalimantan used rain water as the main source of drinking water, indicating a high level of reliance on the environment and dependency on a source of water that is not considered clean water. Furthermore, one-fifth of that population relied on river water as a source of drinking water.

Table 3.9 depicts detailed information on the sources of drinking water across provinces, according to the 2010 Population Census figures. In general, many of the households in Indonesia rely on protected water as a source for drinking water. However, more than half of the households in Jakarta and Riau Archipelago consumed bottled water. This high rate of bottle water consumption is alarming and challenging for future sustainable development as the production of water bottles is harmful to the environment. In addition, Table 3.9 also shows that households in many provinceshave protected wellsas sources of drinking water. The government can enhance this asset and improve access to safe, affordable and clean drinking water by gradually building an infrastructure network of water pipes across nation. Technology can also play an important role in expanding access to drinking water by developing, or acquiring, a technology that transforms any source of water into safe drinking water (e.g., Slingshot water purification by DEKA).

TABLE 3-9

Percentage of Households by Source of Drinking Water: Indonesia, 2010

Province	bottled water	Piped water into dwelling	Retail piped water	Pump water	Protected Well	Un protected well	Protected spring	Un protected spring	River water	Rain water	Others	Total
Aceh	20.35	7.63	2.31	2.69	38.88	15.02	4.80	2.66	3.94	1.24	0.49	100.00
North Sumatra	12.29	18.71	3.26	12.06	27.19	8.47	7.45	3.55	3.54	2.71	0.77	100.00
West Sumatera	12.78	17.71	2.41	2.83	31.12	11.71	8.02	6.14	3.60	3.12	0.56	100.00
Riau	23.60	1.80	0.58	4.74	28.97	13.96	1.10	0.62	2.43	21.85	0.34	100.00
Jambi	10.96	14.51	0.75	1.53	34.03	16.92	1.59	1.17	7.09	11.03	0.41	100.00
South Sumatera	9.18	14.17	3.34	1.94	40.21	12.58	1.63	1.34	8.76	6.40	0.45	100.00
Bengkulu	8.07	11.14	0.80	1.38	32.11	32.98	4.37	5.08	3.32	0.25	0.50	100.00
Lampung	7.81	2.97	1.34	2.49	53.27	22.11	2.96	2.95	1.91	1.47	0.71	100.00
Bangka Belitung	26.03	2.19	0.35	6.04	46.38	14.71	1.34	1.02	1.10	0.60	0.25	100.00
Riau Archipelago	50.06	13.18	2.13	0.64	19.83	7.65	3.40	1.61	0.21	1.05	0.24	100.00
Jakarta	50.69	19.60	5.32	18.51	5.51	0.12	0.10	0.00	0.00	0.10	0.06	100.00
West Java	17.75	8.64	3.10	18.24	31.65	6.65	8.72	3.99	0.64	0.19	0.42	100.00
Central Java	4.70	12.38	4.30	12.86	42.59	6.30	12.11	3.21	0.49	0.86	0.20	100.00
Yogyakarta	12.18	7.51	0.57	7.69	56.56	5.76	3.38	1.09	0.15	4.82	0.28	100.00
East Java	11.45	11.36	3.70	17.96	36.44	4.55	10.79	2.26	0.48	0.62	0.39	100.00
Banten	31.05	6.33	3.63	23.61	20.32	6.12	3.23	3.02	1.72	0.54	0.42	100.00
Bali	27.07	29.51	1.49	3.12	15.21	1.00	15.14	2.12	1.20	3.98	0.16	100.00
West Nusa Tenggara	8.41	10.91	5.84	6.80	46.96	6.01	11.84	1.85	1.12	0.05	0.20	100.00

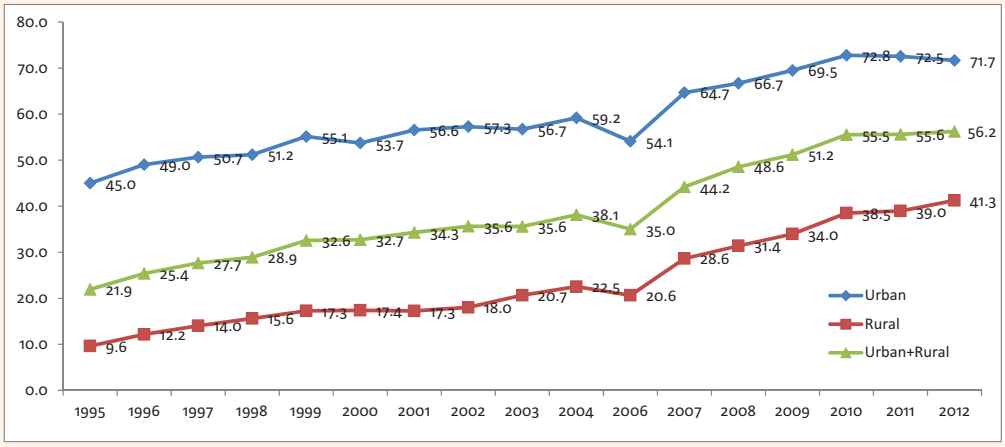
Province	bottled water	Piped water into dwelling	Retail piped water	Pump water	Protected Well	Un protected well	Protected spring	Un protected spring	River water	Rain water	Others	Total
East Nusa Tenggara	1.23	12.04	7.91	0.62	22.58	6.77	26.63	13.67	4.76	3.20	0.58	100.00
West Kalimantan	7.19	6.94	1.45	1.25	8.73	5.89	4.42	2.48	20.93	40.56	0.14	100.00
Central Kalimantan	9.16	15.17	1.77	11.13	17.40	7.94	2.13	1.07	25.38	8.62	0.24	100.00
South Kalimantan	6.87	24.28	9.62	10.28	13.57	14.07	0.86	0.78	17.11	2.32	0.24	100.00
East Kalimantan	25.75	32.95	4.93	3.01	9.05	5.30	1.81	0.83	8.49	7.46	0.41	100.00
North Sulawesi	17.14	16.26	6.75	4.19	30.60	7.59	12.70	2.26	0.47	1.55	0.49	100.00
Central Sulawesi	7.60	15.40	3.89	12.19	22.28	9.01	16.25	4.29	7.72	0.91	0.47	100.00
South Sulawesi	12.28	15.96	4.39	13.10	28.90	9.30	9.59	3.23	1.66	1.42	0.16	100.00
Southeast Sulawesi	6.05	14.87	3.87	4.32	35.67	10.53	14.25	4.37	3.26	2.66	0.16	100.00
Gorontalo	5.39	13.12	4.99	4.68	50.13	11.18	4.69	2.21	2.98	0.10	0.53	100.00
West Sulawesi	5.25	8.53	2.71	4.83	31.02	14.03	15.58	9.09	8.27	0.63	0.04	100.00
Maluku	3.52	13.49	6.82	4.53	37.32	5.69	19.69	3.97	2.58	2.38	0.01	100.00
North Maluku	2.69	22.32	4.80	1.62	41.62	10.34	5.99	1.02	4.32	4.91	0.38	100.00
West Papua	19.13	12.63	2.04	2.61	19.41	7.28	7.84	2.91	10.63	15.37	0.14	100.00
Papua	10.17	8.66	1.59	1.03	8.02	5.51	19.19	15.78	16.97	12.38	0.71	100.00
Indonesia	14.70	12.15	3.55	12.42	32.14	7.64	8.44	3.11	2.70	2.77	0.37	100.00

Source : BPS (2011)

Water consumption is closely tied to sanitation. The percentage of households with decent sanitation has increased from 21.9 percent in 1995 to 56.2 percent in 2012, as shown in Figure 3.28. Unfortunately, less than half of rural householdsdo not have decent sanitation; whereas,more than 70 percent of urban households have decent sanitation.

FIGURE 3-28

Percentage of Households with Decent Sanitation: Indonesia, 1995-2012

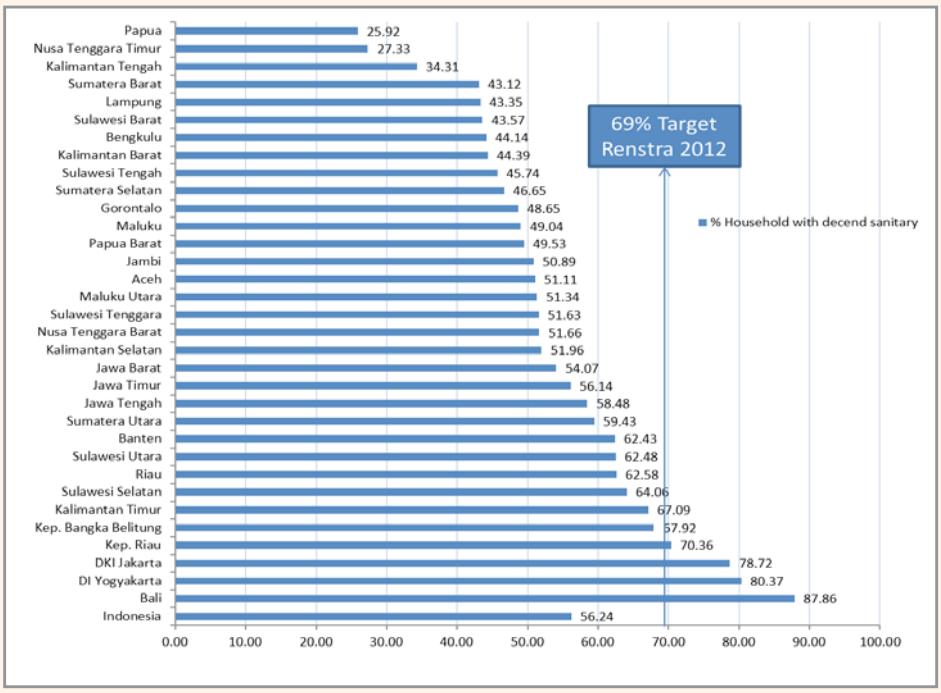


Source: Ministry of Health(2013)

Furthermore, Figure 3.29 depicts wide inequality among the provinces with regardsto decent sanitation. The percentage of households with decent sanitation ranged from as low as one quarter in Papua to as high as 87.9 percent in Bali. These figures suggest that many provinces did not meet the targets of the 2012 strategic plan (*renstra/rencana strategi*) which targeted a 69 percent sanitation coverage rate. According to Figure 3.28,only four provinces met this target. Moving forward, clean water and decent sanitation is essential to the health of people.

FIGURE 3-29

Percentage of Households with Decent Sanitation by Province: Indonesia, 1995-2012



Source: Ministry of Health(2013)

3.3.3 The Air We Breathe

As previously mentioned, water has the potential to become the "new oil" producing worse global conflicts than that of oil. However, one key difference is that oil can be substituted but water is indispensable to human survival. Air is also fundamental to all living creatures, human-beings, and life as we know it. Without clean and healthy air, people will not survive.

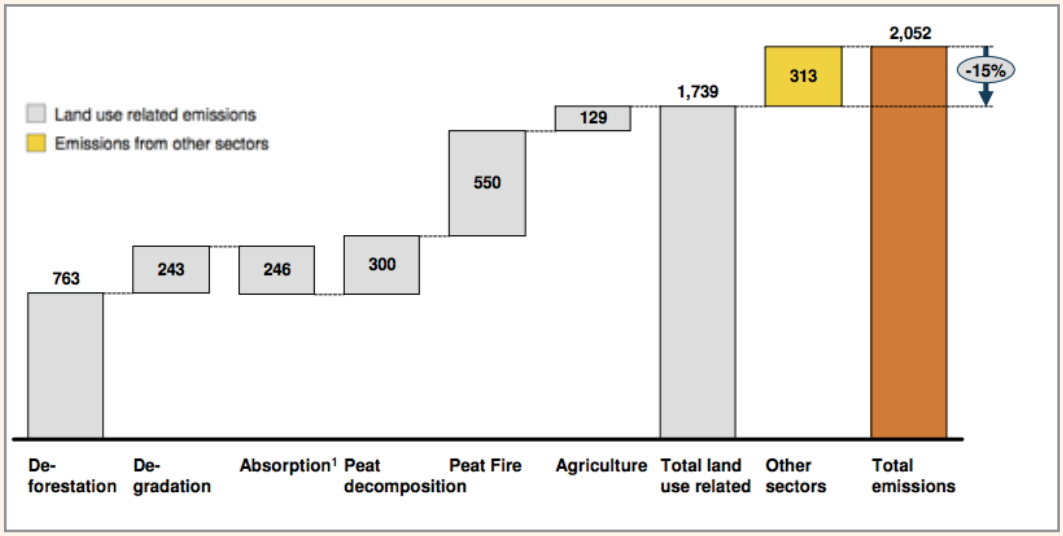
If the air becomes heavily polluted from natural disasters, or man-made disasters, it too can become a political commodity. For example, think ofthe recent eruption of Mount Kelud on 13 February, 2014 in East Java that spewed ashes to remote places or the haze caused from fires on plantations in Sumatra and Kalimantan.Clean air will become the "new water," in an even bigger way than "new oil", resulting in fierce conflicts internationally and within a country. In 2002, the annual haze produced from forest fires in Sumatra and Kalimantan entered global discussions on the agreement of a tranboundary haze pollution among the ten ASEAN Member Countries. The agreement binds ASEAN countries to tackle transboundary haze pollution resulting from land and forest fires. ASEAN reaffirmed its commitment to

establish an effective monitoring, rapid response and firefighting systems. Indonesia has finally ratified the agreement on September 2014, 12 years after the discussion began in 2002.

Air pollution also contributes to global warming through greenhouse gas emissions (GHGs), resulting in a rising temperature and more frequent occurrences of storms, floods, droughts and other natural disasters. Global warming will reduce humans' health status, limit mobility, and reduce productivity. Indonesia's National Council on Climate Change (2010) estimated that 85 percent of Indonesia's GHG emissions were due to changes in land use activities, as indicated in Figure 3.30.In particular, deforestation and peat fires were the two largest sources of total GHG emissions at 37 percent and 27 percent,respectively. Agriculture expansion, especially of monoculture oil palm plantations, have contributed significantly to rapid deforestation in the last 20 years, according to Singh and Bhagwat (2013). Illegal logging is also one of major drivers of deforestation resulting in an estimated loss of revenues of US$ 3 million per year (UNEP 2007). These facts reflect a profit-oriented development pathway that holds substantial negative implications on air security and the well-being of Indonesians. Reaching Indonesia's SDGs means addressing the pressing issue of air security. The existence of high CO_2 emissions can be seen as one of the indicators of unsustainable development. CO_2 emissions levels reflect the nature of economic activities and their impact on the environment, affect food security through agricultural production, and the health of the people through the air we breathe.

FIGURE 3-30

Breakdown of Indonesia's Emissions into Major Sources (in Million tonCO2e)



Source: Indonesia's National Council on Climate Change (2010)

Air pollution has become the world's largest single environmental riskas elaborated in by the WHO.18In 2012, air pollution resulted in around 7 million deaths, or one in eight of total global deaths. This number is double previous figures. Furthermore, there is strong association between indoor and outdoor air pollution and cardiovascular diseases, such as strokes, ischaemic heart disease, and cancer. Air pollution is also responsible for the development of respiratory diseases, including

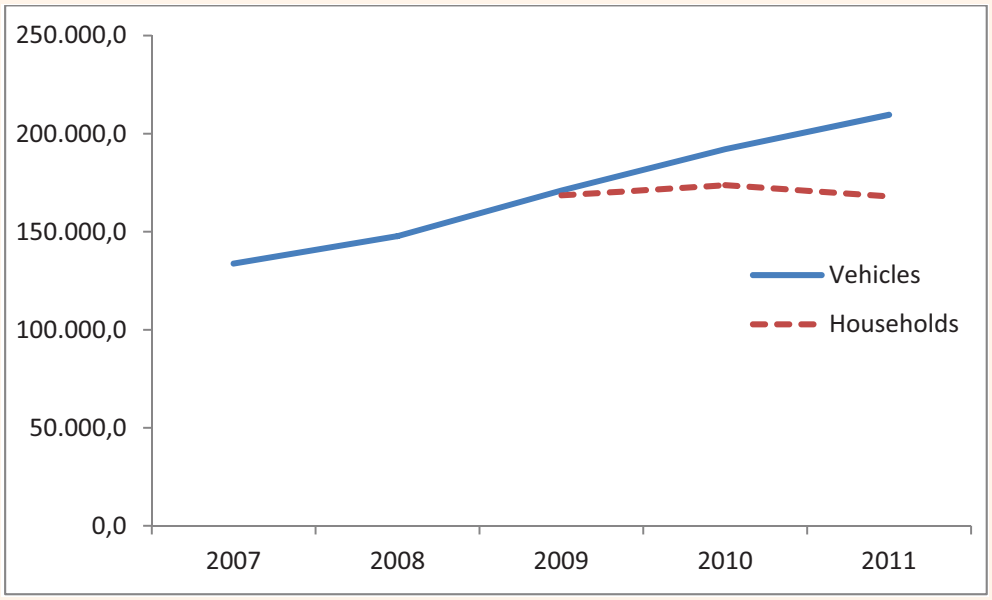
18 WHO report, "Release from WHO on 24 March 2014"

acute respiratory infections, and chronic obstructive pulmonary diseases. Therefore, reducing air pollution will save millions of lives and raise the health status of millions of people. The WHO release mentioned that unsustainable policies in sectors such as transport, energy, waste management and industry have contributed to the air pollution. A change in policies toward sustainable development, particularly in the aforementioned sectors, will improve the health of the people, save lives, reduce the cost of health care and mitigate climate change.

The transportation sector is a major contributor of CO_2 emissions. Figure 3.31 depicts the rise in outdoor CO_2 emitted from motorized vehicles from 129,484 thousand tons in 2007 to 201,503 thousand tons in 2013. One reason for the increase is the rise in sales of motorized vehicles boosting the Indonesian economy due to easy access to credit. This increase in Co_2 levels has been accelerating at an alarming rate and poses serious challenges in the future. Meanwhile, the indoor air pollutant, such as CO_2 emissions from households, has been relatively stable and even with a tendency to decline.

FIGURE 3-31

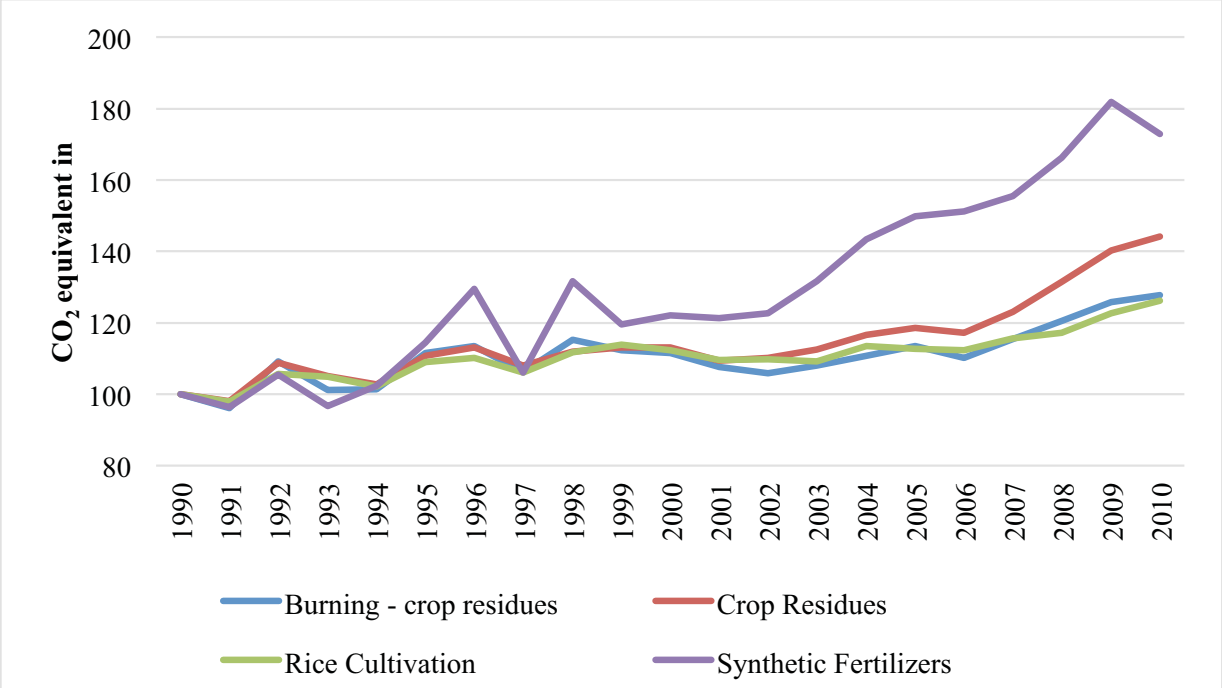
Trend in Estimates of CO2 Emissions from Households and Motorized Vehicles: Indonesia, 2007-2011



Source: Drawn from Badan Pusat Statistik (2013)

Agricultural food production in Indonesia has led to considerable negative impacts on the environment. This is in part due to the limited knowledge of farmers on sustainable farming techniques and thus an overreliance on synthetic fertilizers that are believed to increase productivity. Fertilizer subsidies may also have contributed to the rise in the use of synthetic fertilizers. Figure 3.32looks more closely atagricultural emissions by type of farming activity. Of note are the CO_2 emissions of synthetic fertilizers that were the highest among other activities, alongsidean increasing trend in their use since 1990. Other activities tended to show stable trends from 1990 to 2006, yet roseafter 2006.

FIGURE 3-32
Agricultural Emissions (CO2eq) by Activities



Source: FAOSTAT 2013

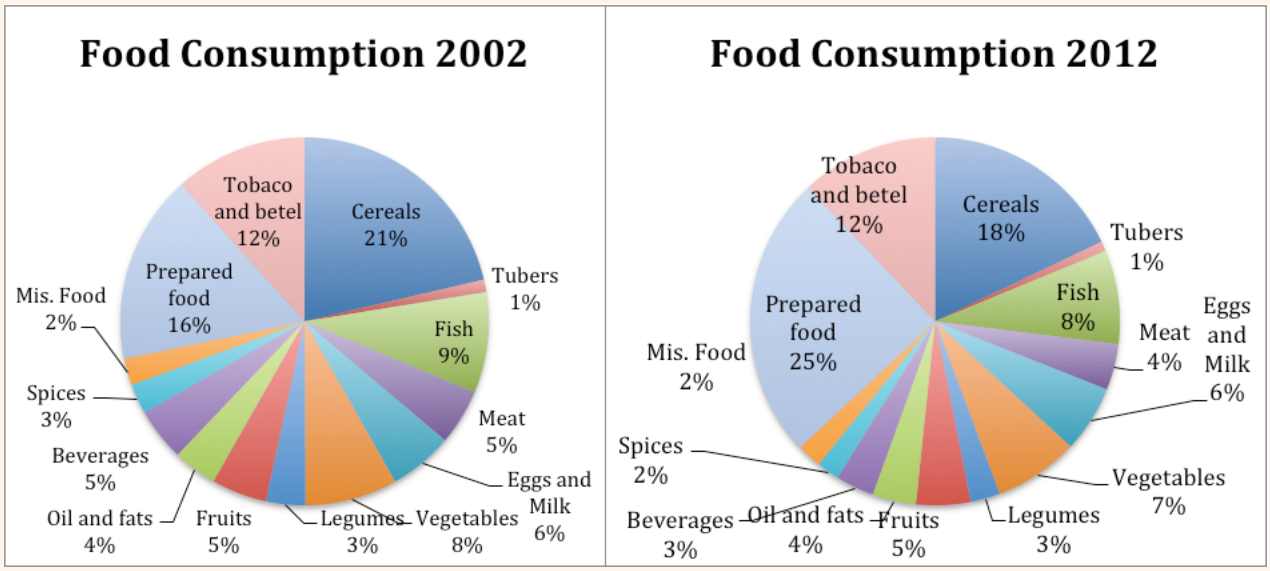
3.3.4 Healthy and Nutritious Food

Feeding a large population with a rapidly rising incomehas proven to be a difficult task given the constraints in domestic food production. Many regions, particularly in Eastern Indonesia continue to be food insecure (World Food Programme 2009) with high poverty ratesas a major factor contributing factor to low levels of food security in these regions. These food insecure regions are likely those with rising income levels coupled with a large population number.

As Indonesia grows richer, food consumption patterns will gradually shift from staple food to dairy, meat, fruits and vegetables.In addition, more and more people will spend a substantial share of their budget on prepared food such as fried rice, mixed rice, instant noodle, etc. Figure 3.33 shows food consumption patterns in 2002 and 2012 and illustrates consumption shares of dairy, meat, fruits and vegetables were stagnant or slightly declining, while the proportion of prepared food increased from 16 percent to 25 percent of total food consumption in 10 years. Nevertheless, consumption shares of cereals, such as rice and corn, dropped from 21 percent to 18 percent.This trend is likely to continue in the future.

FIGURE 3-33

Changes in Food Consumption Pattern



Source: Central Bureau of Statistics

This new pattern of consumption, especially increased consumption of meat and dairy, requires a longer chain of production and more resources such as land, water, air, capital, skill, and labor. These same resources can also be used toward producing food with a shorter, and environmentally friendly, chain of production. A longer production chain is accompanied by more greenhouse gas emissions, especially from methane produced by livestock. Cutting the chain of production will therefore help mitigate climate change, raise the health status of people, and create better environmental conditions. It is crucial to anticipate this consumption shift as it will affect Indonesia's ability to produce its own sustainable, healthy and delicious food.

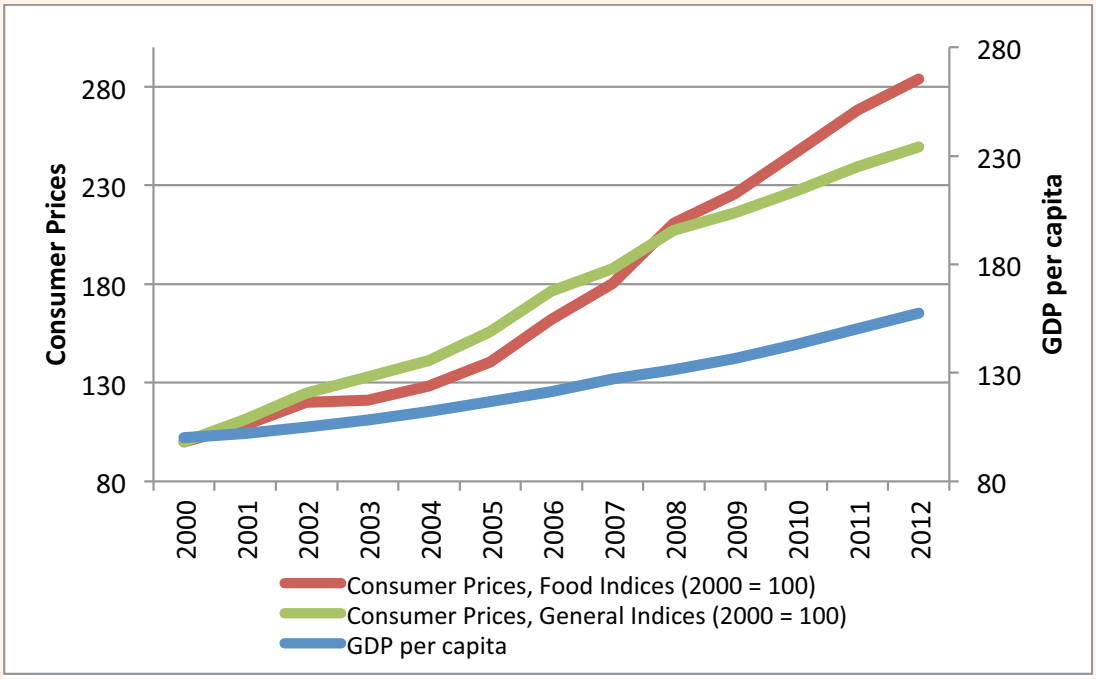
The Food and Agriculture Organization (2009) defined food security as the point when people have physical, social and economic access to sufficient and nutritious food at all times that meets their dietary needs for a healthy and active life.Using this definition, the Economist Intelligent Unit (2013) assessed global food security by creating a global food security index (GFSI) to compare the food security of 107 countries in 2013.Three dimensions are taken into account to calculate the GFSI: affordability, availability, and quality / safety witheach variable measured by a set of indicators.

In 2009, Indonesia ranked 66 out of the 107 countries, below Singapore (16), South Korea (24), Malaysia (34), China (42), Thailand (45), Vietnam (60), and Philippines (64). Indonesia's food security is lower than the average of the indexes in the 107 countries. Indonesia's weak score resulted from high levels of corruption, low public expenditure on agricultural research and development, low GDP per capita, low protein quality, and lack of diet diversification.In particular, low income levels limited food affordability, asthe poor have limited food choices and spend around 70 percent of their budget on food. As such, they become very vulnerablewhen food prices increase.Since 2000, food prices have increased significantly contributing largely to increases in general consumer prices. Food prices have increased by more

than 183 percent while GDP per capita has increased by only 58 percent, as indicated in Figure 3.34.Substantial increases in food prices have reduced the average person's purchasing power, especially the poor, as their incomes grow much slower than increases in food and general prices. In other words, food affordability remains a key issue for many Indonesian poor,despite a declining poverty rate in Indonesia.

FIGURE 3-34

Food Prices and GDP per capita, 2000 - 2012



Source: FAOSTAT

Within Indonesia, the most food insecure regions are located in the Eastern part of Indonesia as indicated by regional food security index (World Food Programme 2009). These regions tend to have high poverty rates, poor basic infrastructure and low levels of investment in health.

Assessment of food security can also be assessed from analyzing the multiple challenges Indonesians suffer related to food. There are at least two types of challenges: the under-nourished and the obese. These people can be rich or poor. Thus, a reduction in poverty rate implies a reduction in hunger but a reduction in hunger does not necessarily result in better nutritional status. Some are under-nourished and struggle to find sufficient amounts of healthy food. Others may have enough food, but the food may not be nutritious. On the other end, we have those with unhealthy consumption patterns that become obese. Again, they may be rich or poor. Therefore, food security is not only about dealing with hunger but also about healthy food. More importantly, we should strive to create healthy and nutritious food security.

Unfortunately, rising income has shifted consumption patterns to unhealthy ones. Domestic production of food, in general, and healthy food, in particular, is still

limited. As a result, Indonesia still relies heavily on imports for its food security. At the same time, efforts to promote domestic production (and benefits to domestic producers) may be in conflict with the benefits of consumers. Cheap prices for food is better for the consumers, whereas a high price for food will encourage producers to produce more. This balance is a delicate one. For example, in 2004 the Indonesian government banned imports of some types of rice to protect rice farmers and people in the rural areas. Unfortunately, the majority of Indonesians in rural areas are net buyers of rice because many are landless labors and small farmers. As a result, the intended beneficiaries of the policy, the rural people, were hurt by the government banning of the import.

These are some of the challenges offood production in Indonesia today and into the future. First, farmers in many regions of Indonesia have experiencedstagnant welfare over time[19] as reflected in a low farmers' terms of trade, or ratio between farmers' earnings and expenditures. A low ratio means that farmers have spent more on other goods and services thanwhat they receivedas income from farming. In addition, they often experienced huge losses due to low prices of their products. All of these factors made farming an unattractive occupation for young people.As a result, the majority of farmers are older persons while the young generation prefers to migrate and work in cities. Furthermore, climate change reduces agricultural output due to irregular and unpredictable weather such as long droughts and irregular rainfalls. Traditional farming techniques and equipment are also inadequate to keep up with extreme climate change. In addition, improvements in agriculture infrastructure, such as a tertier irrigation system, rely heavily on local governments. All of these factors lead to low agricultural production and difficulties for Indonesia to meet domestic demand. Indonesia has resorted to importing a large amount of food, and hence, becomes vulnerable to international price changes, particularly as it integrates further with global food trade.

Second, rapid agricultural land conversion in Indonesia has undermined efforts in attaining food security and sovereignity. Accelerated expansion of industrial estates is considered one of the main drivers of extensive agricultural land conversion in Indonesia (Firman 1999). Rapid housing development have also caused large-scale agricultural land conversion. During theperiod of 2000–2002 alone, it was estimated that agricultural land was converted for residential developments (48.96%), industrial (36.50%)and administrative sites (14.55%) (Irawan 2008). Furthermore, Firman (1999) found that agricultural land conversion caused the remaining paddy fields to have lower productivity from 4.5 tons to 3.5 tons per hectare. These examples highlight the need for policies to maintain the limited existing agricultural land to ensure food security.

Third, food production is also often hampered by the existence of cartel for certain key food commodities. Oligopolistic market structures have been seen (though difficult to prove)infive commodities (soybean, rice, corn, sugar and beef) resulting in price volatility and scarcity of food. The resulting high prices do not benefit the farmers because most farmers are net consumers of food, as in they consume more than produce.This cartel has been investigated by KEN (Komisi Ekonomi Nasional – National Economic Commitee), a committee comprised of economists and business people assisting the President in economic development.[20]

19 According to the CBS's data, farmers' term of trade increased slightly from 100 (2009) to 105 (2013).

20 For more information on the commodity cartel, please review Tempo article: Lima Komoditas Diduga Dikuasai Kartel (February 1, 2013).

Fourth, the domestic market has not been sufficiently integrated with other markets. As a result, surplus in one region cannot be quickly channelled to another region that is experiencing scarcity of food. Lack of integration is due to high shipping costs; limited interregional trade; price differentials and market fragmentation; barriers to transport and trade; and substantial regional differences in average earnings.

Fifth, various international and domestic crises have resulted in high food prices and a reduction in supply of food. The crisis have been economic and financial in nature, such as in 2008-2009, as well as, stemming from a natural disaster such as flooding and volcanic eruption. For example, food crops and agriculture were seriously damaged in the recent eruption of Mount Kelud in East Java and Sinabung in South Sumatra.

In summary, achieving food security will be a great challenge due to a host of issues addressed in this section, such as: high levels of corruption, low public expenditure on agricultural research and development, low income, low protein quality, lack of diet diversification, lack of interest in farming, rapid agricultural land conversion, existence of oligopolic markets, poorly integrated domestic food market and other external factors affecting food prices. The composition of the current population will largely be responsible for achieving food security goals. A significant number of the working age population will potentially become middle class and have particular preferences and dietary habits. Once that population ages, they will require a different diet. Given the projected population number, the government can start planning and addressing the abovementioned issues in anticipation of the changing consumption patterns of a different population in order to secure not only food security, but also food sovereignity in reaching the future Indonesia wants.

3.3.5 Green Renewable Energy

Energy security is not achieved when there is a high likelihood of a crisis in energy supply. This energy crisis has been a concern of many governments and nonprofits, including Indonesia's, far before they were concerned about CO_2 emissions. The prosperity of Indonesians has also risen rapidly and is expected to continue rising. Meanwhile, rising consumption per capita coupled with a large population will create a great challenge for Indonesia to provide energy for current levels of use, as well as future development activities that might require additional energy. For example, more people will depend on transportation, electrical appliances and lights – all requiring additional energy.

Indonesia does have abundant energy resources but that does not automatically guarantee energy security. Security is not only affected by demand, but also by the utilization of the supply. To date, energy resources have not been utilized efficiently mostly due to institutional issues such as regulatory uncertainty, weak implementation of energy plans, low human capacity and wasteful behaviour in energy consumption. Therefore, providing energy security has been one of the primary concerns of the Indonesian government. Based on the goals of energy management as stated in the Law no 30/2007, most Indonesian policymakers and analysts speak in terms of the 4 As(availability, accessibility, affordability and acceptability). In other words, energy is available at all times and in various forms; exists in sufficient quantities; and is accessible by most people at affordable prices; and finally, is obtained in a way that does not harm the environment. Although the law does not specifically define energy security, most policy makers and

energy analysts view energy security in these ways (Indriyanto 2010). Based on this definition, Indonesia is arguably still far from achieving energy security given the fact that some regions still lack of access to energy and still experience energy deficits.

Despite its vast and abundant energy resources, Indonesia facesan energy crisis in several regions. Growing energy demands, particularly for electricity,cannot be met because ofa limited capacity of current power plants and slow progress in expanding existing plants' capacity. Meeting this rising domestic energy demand,alongwith a limited production capacity,is quite a challenge. Table 3.10 shows an imbalance in the growth of electricity consumption and production across regions in 2012. All regions experienced rapid growthin consumption above 9 percent, yet capacity growth, or production levels, weremuch less. For example, Kalimantan's demand for electricity grew by 9.2 percent per year, whereas additional electricity capacity only grew by 1 percent per year. Perusahaan Listrik Negara (PLN), a state-owned electric company, (2012) reported that electricity demand in Eastern Indonesia is also substantially high as indicated by a long waiting list of prospective customers.

TABLE 3-10

Regional Electricity Sales Growth and Additional Capacity Growth

Region Name	Electricity Sales Growth (% per year)	Additional Capacity Growth (% per year)
Sumatera	9.6	5.2
Kalimantan	9.2	1
Sulawesi	9.6	2.7
East Indonesia (Maluku, Papua, Nusa Tenggara)	N/A	N/A

Source: PLN 2012

Currently, oil dominates Indonesia's energy mixaccounting for 37 percent of total primary energy demand (International Energy Agency 2013). However, since 2000, the domestic oil production has declined significantly despite an increase in demand. As a result, Indonesia is now a net oil importer. The demand for oil is largely driven by a strong economy, population growth and a large fuel subsidy. In addition, the combination of fuel subsidies, easy access to vehicle credit and poor public transport has created strong incentives for motor vehicle ownership. Energy subsidies are still taking up a large proportion of the Indonesian government budget and result in overconsumption, energy inefficiency and disincentives for the development of alternative or renewable energy (Indriyanto 2010). Furthermore, subsidies place a large burden on the government budget and reduce fiscal space for other productive public investments.

In general, Indonesia's total energy mix is still dominated by fossil fuels (oil, gas and coal). This energy mix will continue until 2035 as population increases and incomes grow. The composition of total energy demand, however, will change from oil to coal. This shift is in part due to highly fluctuating world oil prices and the relatively abundant and cheap coal reserve in Indonesia. Coal will be used mostly for power generation, however, there is a growing concern that power plants based on coal are dirty and cause air pollution during electricity generation. This example demonstrates how achieving one goal, like energy security, might not be

in line with achieving another, such as air security. One alternative is the use of clean technology, such as carbon capture storage (CCS), which can help mitigate the negative impact of coal-based power plants.

Renewable energy is still underutilized and underexploited in Indonesia despite its large potential. Compared to solar, wind and hydropower, geothermal has the largeest potential as an alternative source of energy. It is estimated that Indonesia has the world's largest geothermal reserves at around 29 gigawatts (GW), and Indonesia is the third largest country with installed generating capacity (EIU 2013). However, only five percent of that potential is currently being used, according to the Ministry of Energy and Mineral Resources. A total of 130 megawatts (MW) of geothermal capacity were added in 2012 as a part of the government's electricity fast-track programs to expand capacity to four GW by 2020 (EIA 2014). Despite the government's recognition of the large potential of geothermal, the actual development of geothermal power plants has been slow (Nugroho 2013). Reasons for slow development include: 1) Local or provincial governments have difficulties issuing a proper geothermal working area due to lack of experience and qualified staff. As a result, many of tender documents and processes do not meet international standards which discourages potential bidders. 2) Pertamina and PLN have little interest in developing geothermal power plants because the economics of geothermal energy is challenging and as state companies they are expected to make aprofit, as required by law. 3)Present and potential areas of geothermal resources can be complicated by local politics, cultural or environmental concerns. For example, recent protests by villagers around the slopes of Mount Rajabasa in Lampung have delayed the completion of the plant because the site is near the village's customary land. 4)No central government agency is appointed to ensure the success of geothermal projects. 5) Other issues hindering the development of geothermal power plants include land acquisition, very high initial and maintenance costs and the definition of geothermal development as a mining activity.

In summary, rising consumption per capita and a larger population, especially working age population, will lead to a substantial increase in demand for energy in the future. However, the current capacity for expansion of energy, particularly electricity, can not keep pace with the rapidly growing consumption levels despite Indonesia's vast sources of energy. As a result, some regions outside of Java are experiencing an energy crisis. Therefore, in pursuit of sustainable development, increasing capacity expansion of electricity should be prioritized to match the demand. In addition, fossil fuels will remain the dominant source of energy through 2030. Nonetheless, there a shift from oil to coal is taking place. Currently, generous energy subsidies still take a large proportion of the Indonesian government budget resulting in overconsumption, energy inefficiency and disincentives for the development of alternative or renewable energy. Relying extensively on non-renewable energy is not sustainable. Indonesia needs to accelerate the development of its extensive potential renewable energy sources, such as geothermal, in order to meet the growing demand of its more affluent citizens and energy intensive industries. In this way, energy security can be reached by taking into account the population trends.

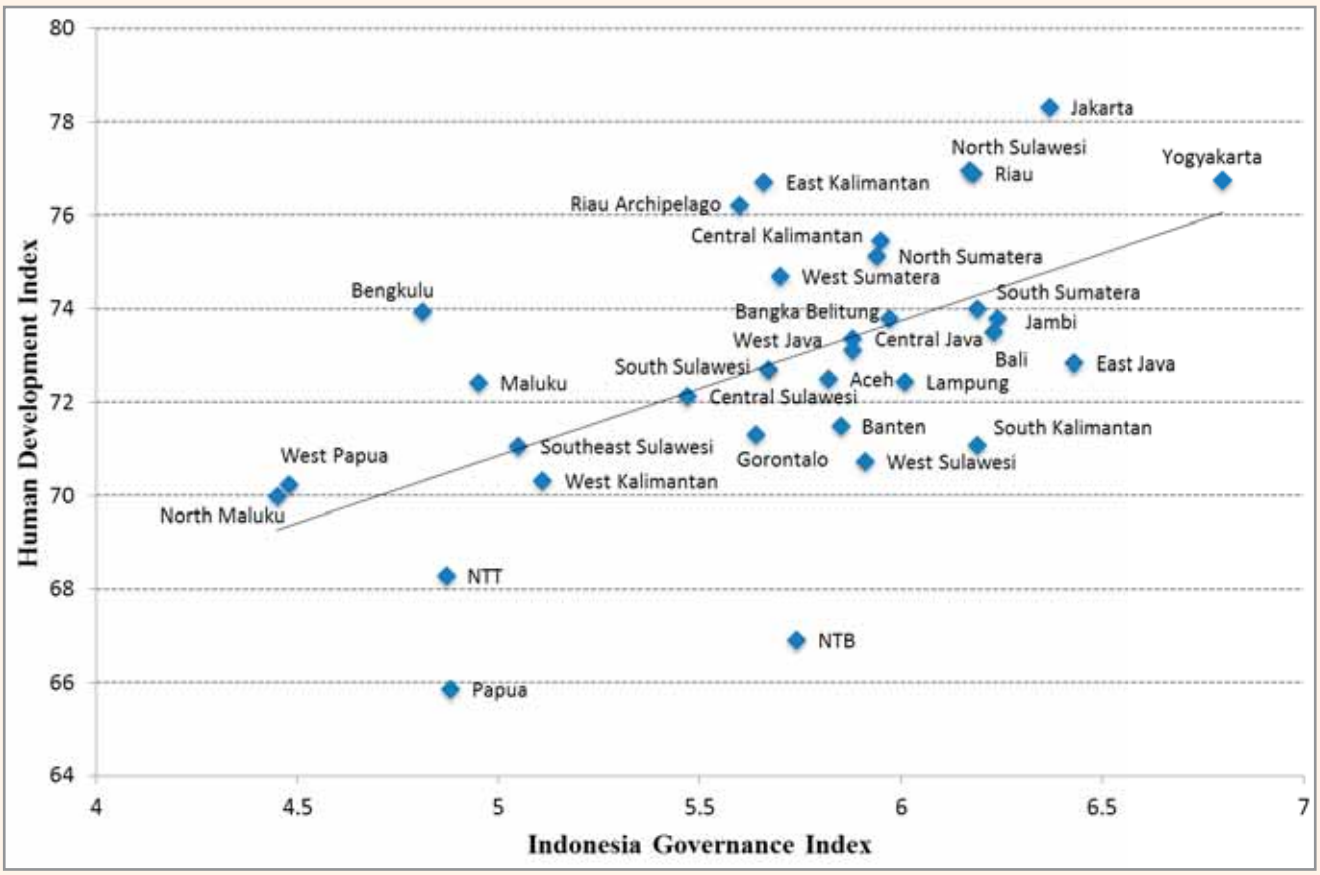
3.4 JUSTICE

Justice is not always easy to discuss due to its abstract and potentially subjective nature. In this framework, justice acts as a means of sustainable development. In a democratized Indonesia, a growing number of people perceiving injustice (real or imagined) can become a potentially political time-bomb. Following Sen, we should be aware there is no "perfect justice," therefore accept that everybody is endowed differently in term of physical and non-physical aspects, many of which cannot be changed. As such, we should aim to minimize, if not eliminate, avoidable injustice. Justice is not seen simply as an institution but rather a concept related to the lives and freedom of the people. One important way to reduce avoidable injustice is to minimize capability deprivation, as discussed earlier in this chapter.

To demystify the concept further, here are some examples illustrating the subjective nature of avoidable injustice. People who are not endowed with "favorable" conditions may feel injustice upon them. For example, an older person who has already lost many of his/her freedoms may feel injustice towards younger ones who are still healthy and active. However, if we can provide an elderly-friendly infrastructure, an older person can gain back some of his/her independence and the feeling of injustice can be reduced. Another illustration is a fifty-year old healthy and productive woman who felt injustice when she had to retire simply because of her age. If we can create a merit-based system, rather

FIGURE 3-35

Indonesia Governance Index and Human Development Index by Province, 2012



Source: Authors' illustration based on data from CBS and Kemitraan.

than one based on juniority and seniority and without a retirement age, we can reduce this avoidable injustice. This merit system, regardless of age and gender, can also reduce avoidable injustice for a young twenty-seven year old lady who is denied a promotion simply because of her age and gender.

Another way to reduce avoidable injustice is the creation of good governance. Good governance is crucial in all efforts to obtain the triple track of sustainable development and to ensure that we can minimize avoidable injustice among Indonesians. According to Kemitraan, a non-government organization that studies regional governance in Indonesia, governance is defined as the process of formulation and implementation of rules, regulations, and development priorities through interaction among executive and legislative branches and bureaucracy with participation from civil society and economic society.21 The Indonesia Governance Index (IGI) is used by Kemitraan to measure performance and quality of provincial governance. The index consists of four elements: (1) government, (2) bureacracy, (3) civil society, (4) economic society and uses a scale from 1 (very poor) to 10 (very good). In 2012, Yogyakarta had the highest IGI (6.80), followed by East Java (6.43) and DKI Jakarta (6.37), whereas North Maluku performed the worst (4.45). Interestingly, provinces with good governance are associated with a high Human Development Index, as shown in Figure 3.35. This positive correlation shows the importance of good governance in improving human well-being and achieving sustainable development. The IGI index can serve as one indicator to evaluate whether a province has good governance performance, and will, in turn, promote human well-being.

Good governance to reduce avoidable injustice includes the elimination of corruption. Minimizing corruption will provide a large amount of money which can be used to reduce capability deprivation. Using data from countries around the world, Gupta, Davoodi, and Tiongson (2002) found that health and education can be improved without an increase in public spending if corruption is reduced. Their study shows that corruption has raised child and infant mortality rates, percentages of low birthweight babies, and dropout rates in primary school. The study also found that rising corruption was also accompanied with higher income inequality and poverty.

In Indonesia today, the financial space is no longer the constraint for sustainable development. Instead, the political space is the constraint requiring the willingness of politicians and bureaucrats to clean up the government from corruption. Furthermore, a better understanding of justice is needed but data and studies are limited, or even absent. Some data on “found” corruption exists, such as the number of cases pursued by the KPK (anti corruption committee). However, in general, data on injustice is currently unavailable despite the fact that justice is an important component of development. Therefore, it is recommended that we, along with BPS, work to develop an index of avoidable injustice, including an index of corruption.

21 See Kemitraan website for more information:http://www.kemitraan.or.id/igi/

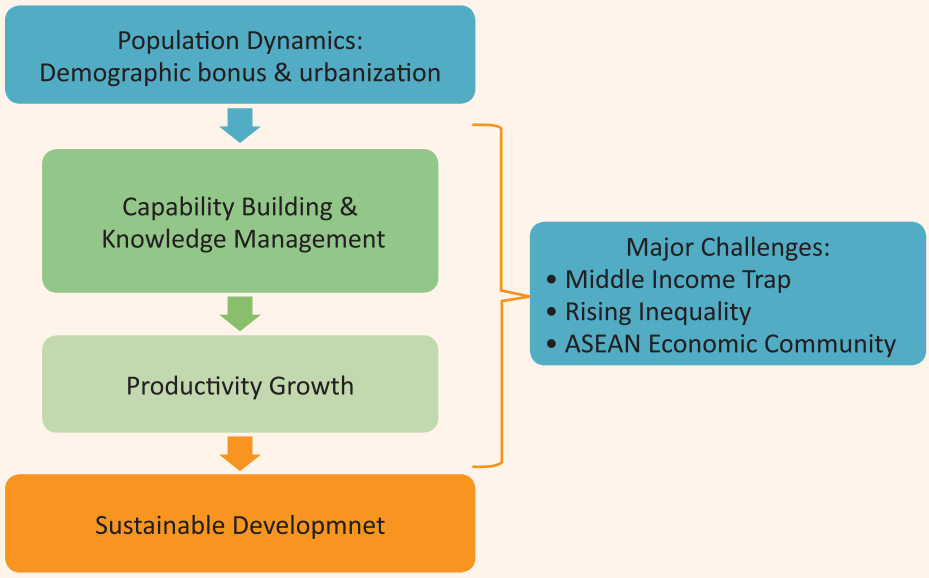
4

Population Dynamics and Sustainable Development Nexus

Productivity is a critical link between population dynamics and sustainable development (Figure 4.1). Demographic shifts, such as an increased number of working age population, can be capitalized on by enhancing their competitiveness. In addition, more people living in cities can benefit the economy if they are equipped with the necessary skillset to seek higher productivity work, such as in the formal sector. Raising productivity becomes an urgent task for Indonesia to accomplish three goals: avoid the middle-income trap (MIT); reduce rising inequality and polarization; and embrace the ASEAN Economic Community. Capacity building through knowledge management will play an important role in increasing total productivity by stimulating creativity and innovation to enhance living standards. All of these factors will contribute to the achievement of sustainable development goals and will be elaborated further in this chapter.

FIGURE 4-1

Link Between Population Dynamics and Sustainable Development



Source: Author's Illustrations

4.1 FAVORABLE DEMOGRAPHIC TRENDS

The following key demographic trends are likely to be favorable for sustainable development, if managed properly. As discussed in previous chapters, Indonesia's population structure will drastically change. The working age population will increase significantly thus providing a large workforce. At the same time, the dependent population (the young and old) will proceed along different trajectorieswith a decrease in the younger population and an increase in the elderly population. By 2030, the working age population will be around 140 million (a 16 percent increase from 2010) with the majority of this group, around 57 percent, concentrated on Java and Bali islands suggesting Indonesia's labor force will continue to be dominated by labor from these islands. Meanwhile, Papua, West Papua and Maluku will experience the fastest growth in their working age population. Given these demographic conditions, Indonesia has a limited time to realize the benefits of a demographic bonus. There is an urgency to take action on the demographic bonus and for these issues to be built into Indonesia's sustainable development.

As Indonesia becomes more urbanized with more than 60 percent of its population living in urban areas by 2030, there is a major opportunity for a structural transformation as people move from low to high productivity sectors. Current projections estimate that by 2030 more than 80 percent of populations in West Java, Riau Archipelago, and Yogyakarta will live in cities. However, all cities across Indonesia should prepare for this trend and provide the necessary infrastructure to support this transition. Formal, high productivity and decent jobs need to be created to absorb the working age population and avoid rising employment in informal and low productivity sectors. At the same time, promotion of sustainable production and consumption patterns can minimize the negative impact higher population densities can have on the environment.

A critical question remains whether Indonesia can seize these opportunities within the context of sustainable development. With the right policies in place, alongside the existing demographic conditions ofa rise in working age population and increased urbanization, Indonesia can move toward an inclusive, sustainable and equitable growth model. This new model improves quality of life, reduces inequality and enhances productivity within the environment's biological capacity. This type of growth requires an emphasis on productivity, sharing prosperity and continuous growth without environmental destruction. Ultimately, Indonesia will be better prepared to avoid the middle-income trap by promoting this new growth model along with capitalizingon the gains from thedemographic bonus and urbanization before Indonesia becomes an aging population.

This new growth model contrastswith Indonesia's current growth modelthat relies heavily on the commodity boom, high-energy subsidies and high global liquidity. To date Indonesia's economic development may be described as the "resource curse," or "the Dutch Disease,"whereby there is a decline in manufacturing as a result of the exploitation and export of natural resources. This model has led to sluggish development and created disincentives for raising productivity, increasing resource enrichment, or reducing income and regional inequality. The UN Secretary General Ban Ki-Moon calls for a new development paradigm to improve living conditions, but one that also challenges current growth models and consumption and production patterns that negatively impact natural resources and biodiversity. Indonesia has the opportunity to pioneer this new development paradigm and lead the way to sustainable development.

4.2 CHALLENGES NOW AND AHEAD

4.2.1 Avoiding the Middle Income Trap

The middle-income trap (MIT) has various definitions among academia and aid organizations, yet all hold a similar message. For example, the Asian Development Bank(2012) defines MIT as "countries stagnating and not growing to advanced country level," while the World Bank (2014) defines it as countries that "float in the middle". A third definition delves deeper by referring to it as "a development stage that characterizes countries that are squeezed between low wage producers and highly skilled and fast-moving innovators" (Ghani et al. 2013). Despite differences in definition, the underlying message remains clear that it is not easy for countries to "graduate" to a higher income group. Moving to the next level requires economic, political, and social reforms with strong leadership and political will. In addition, the implementation of such reforms requires not government involvement but also a high level of participation from the Indonesian people. Fortunately, an increasing number of Indonesian people are actively participating in state matters as demonstrated by high levels of participation in the 2014 presidential election.

Countries are classified based on different income thresholds. As mentioned previously, the Asian Development Bank (ADB) and the World Bank (WB) have different definitions of MIT. However, we employ the definition by ADB (2012) since it includes income classification and time thresholds. As such,lowermiddle-income countries are those with a Gross Domestic Product per capita (using 1990 PPP constant price) between US$ 2,000 and US$ 7,250 while upper middle-income countries have an income rangeof more than US$ 7,250 but less than US$ 11,750. High-income countries are those with a GDP per capita of more than US$11,750.

According to ADB (2012), a country is considered in the lower-middle income trap if it stays in the respective income range for 28 years or more. Whereas, a country is classified as in the upper-middle income trap if it remains in the respective income level for 14 years or more. An average rate of 4.7 percent growth per year is needed to avoid the lower-middle income trap, however, Indonesia fell below that rate with an average growth rate of 3.5 percent per annum between 2000 and 2010.

According to ADB (2012), Indonesia had US$ 4,790 GDP per capita (1990 PPP$) in 2010. Using the World Development Indicators, we estimated Indonesia's GDP per capita growth of 5.1 percent (2011), 4.9 percent (2012), and 4.5 percent (2013) and concluded that Indonesia's GDP per capita was US$ 5,519 in 2013. However, this figure is far below the threshold of US$ 7,250 for upper middle-income country status thus keeping Indonesia within the lower middle-income trap. However, an ADB study suggests that Indonesia was not yet in the lower middle-income trap because Indonesia's GDP increased over the last 25 years and remained within the income range of US$ 2,000 and US$ 7,250 (i.e. that of a lower middle income country).Based on two different scenarios of economic growth (Table 4.1) that assume a constant GDP of 5 percent and population growth of 1.1 percent (average 2010-2030), we predict Indonesia will exit the lower middle-income trap by 2021 and graduate to a high-income country by 2034. This growth will boost Indonesia to an upper-middle income country for 13 years and present the next challenge ofavoiding the upper-middle income trap.

TABLE 4-1

Economic Scenarios of Moving to Higher Income Group for Indonesia

	GDP 5% Growth	GDP 7% Growth		GDP 5% Growth	GDP 7% Growth
2010	4,790	4,790	2023	7,835	10,013
2011	4,975	5,070	2024	8,137	10,597
2012	5,167	5,365	2025	8,451	11,216
2013	5,366	5,678	2026	8,777	11,870
2014	5,573	6,010	2027	9,116	12,563
2015	5,788	6,361	2028	9,467	13,296
2016	6,011	6,732	2029	9,832	14,072
2017	6,243	7,125	2030	10,212	14,893
2018	6,484	7,540	2031	10,606	15,762
2019	6,734	7,980	2032	11,015	16,682
2020	6,994	8,446	2033	11,440	17,656
2021	7,264	8,939	2034	11,881	18,686
2022	7,544	9,461	2035	12,339	19,777

Lower-middle income status Upper-middle income status High-income status

Source: Authors' Estimation

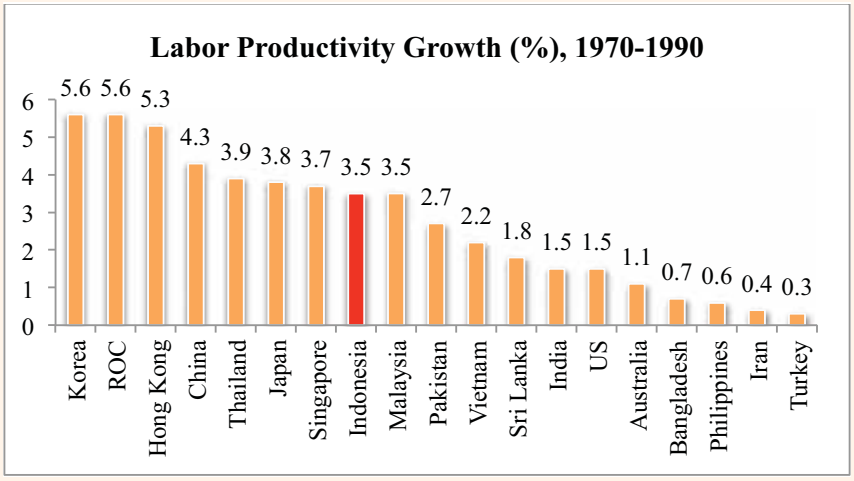
Our scenarios show that with a GDP growth of 7 percent, Indonesia will move to upper-middle income status by 2018 and stay within this income group for 8 years with graduation to a high-income group expected by 2026. However, this projection may be overly optimisticgiven that maintaining a constant 7 percent growth is difficult with the increasing risk of growth slowdown as Indonesia becomes increasingly integrated into the world economy and aims to achievegrowth within the framework of the triple-tracks of sustainable development. External factors also pose a risk to growth such as ultra-low interest rates in developed countries and weaker global demand for Indonesia's major commodity exports such as coal and crude palm oil. Deeper integrationinto the world economy exposes Indonesia to the negative impacts of economic shocks in other countriesthat can spread and hold consequences for Indonesia's economy for a long period of time. Internal risk factors to growth also exist such as the widening current account deficit and political situations that mayundermine efforts in achieving sustainable development. As such, managing these risks becomes a critical cornerstone to sustainable development.

How a country falls into the MIT is equally important to understand. Eichengreen et al. (2012) argue that falling into the MIT is primarily due to growth slowdowns. The World Bank (2014) suggests growth slowdowns can be avoided through a combination of boosting labor productivity and/or increasing the number of people working. Increasing productivity is a medium term goal that requires time, but nonetheless, Indonesia should take concrete actions now to boost productivity latergiven the statistics highlighting Indonesia'sslow productivity growth.

As shown in Figure 4.2, Indonesia's labor productivity growth stood at 3.5 percent between 1970 and 1990. By comparison, this growth rate is slightly less than Singapore (3.7 percent) and Malaysia (3.5 percent). However, it is notable that Indonesia's labor productivity growth declined significantly to 2.4 percent between 1990 and 2011. Other countries experienced a similar slow growth of productivity, yet Singapore and Malaysia experienced only a moderate decline in their productivity growth. China showed the highest increase at 9.1 percent from 1990-2011. In summary, Indonesia's labor productivity has grown over time but it decelerates in growth from 1990-2011.

FIGURE 4-2

Labor Productivity Growth 1970-2011

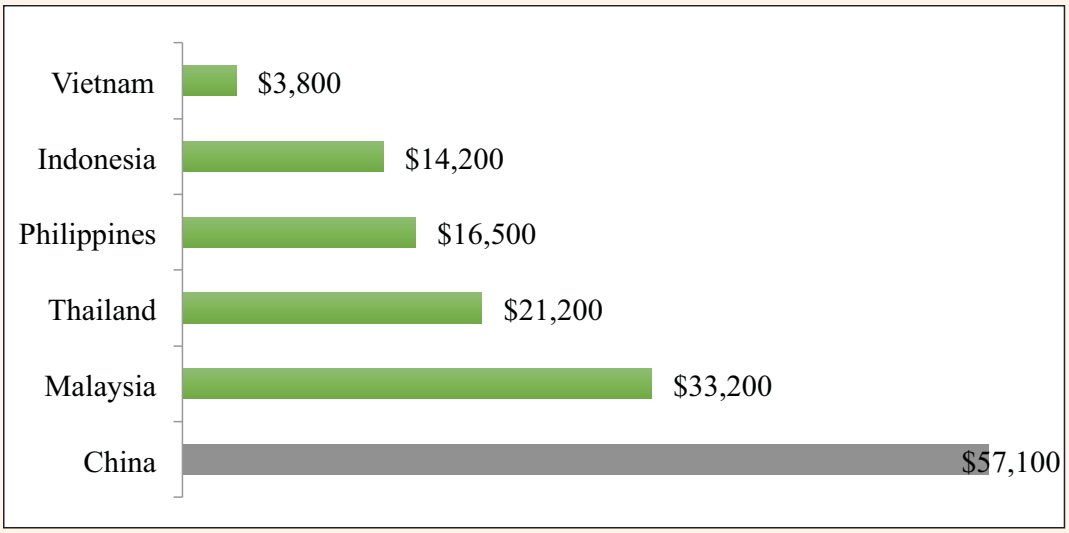


Source: APO Productivity Database (2013)

Currently, China is experiencing the new normal of slower growth, rising labor costs and less reliance on exports. As a result, many multinationals are looking to other countries with lower labor costs for manufacturing activities thus creating a big opportunity for Indonesia and other ASEAN countries. Indonesia has the advantages of low labor costs along with a growing number of working age population, however, Indonesia's labor productivity is still lower than other countries in Southeast Asia (Figure 4.3). In order to seize this opportunity, Indonesia must raise its labor productivity to improve its competitiveness.

FIGURE 4-3

Annual Manufacturing Output per Worker, 2012



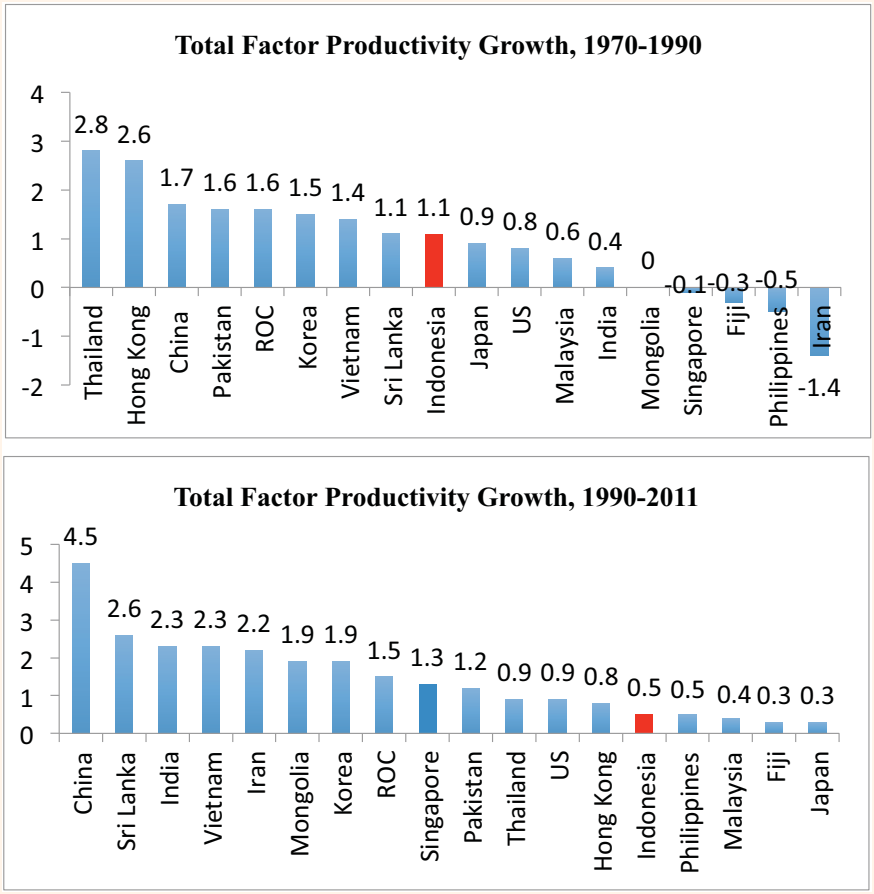
Source: McKinsey Global Institute (2014)

Total factor productivity (TFP), or the efficiency in utilizing labor, capital and other inputs (i.e. technological change) plays an important role in improving overall productivity. Unfortunately, Indonesia experienced a significant drop in TFP growth between 1970 and 2011 from 1.1 percent (1970-1990) to 0.5 percent (1990-2011) (Figure 4.4). At the same time, many neighboring countries experienced a substantial rise in their TFP. For example, Vietnam's TFP increased significantly from

1.4 percent (1970-1990) to 2.3 percent (1990-2011). One criticalfactor that enhances TFP is efficiency in production method (i.e., technological progress). Unfortunately, Indonesia still relies on labor-intensive sectors with low labor productivity and low technology resulting in slow progress in boosting overall productivity.

FIGURE 4-4

Growth of Total Factor Productivity, 1970-2011

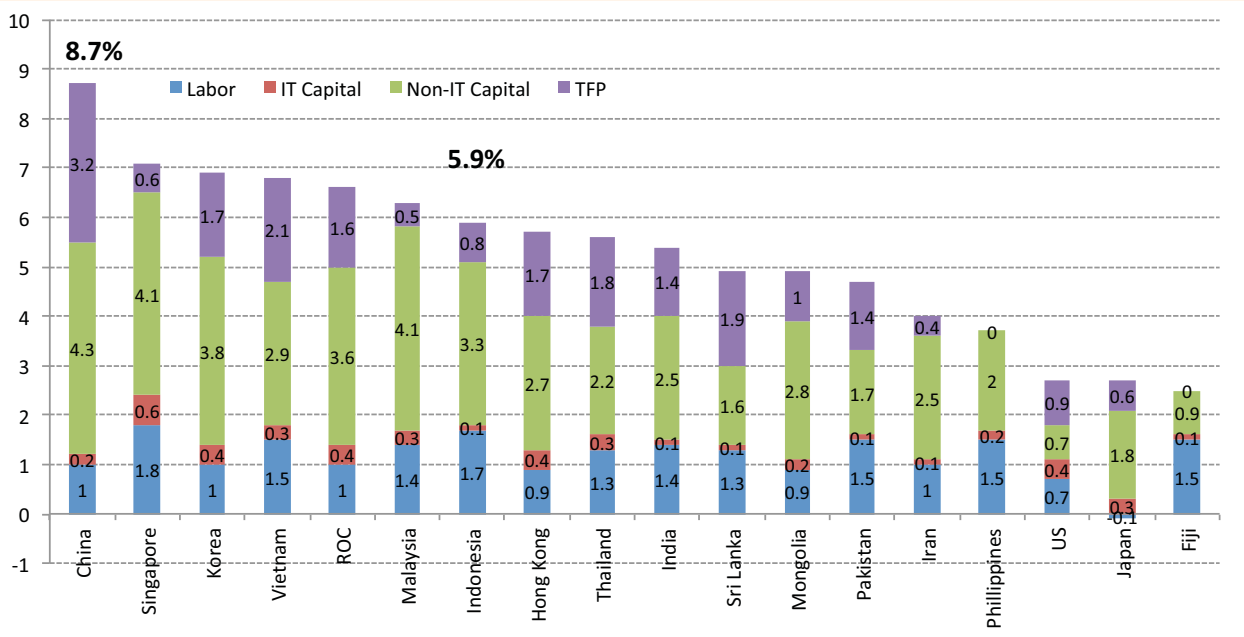


Source: APO Productivity Database 2013

By deconstructingthe sources of economic growth by production factor, we can study which components of economic growth can and should be improved (Figure 4.5). In comparison to other countries, the contribution of TFP to Indonesia's growth is relatively small (0.8 percent out of a total 5.9 percent).Whereas, China's TFP contributes 3.2 to 8.7 percent to economic growth. For Indonesia, opportunities for enhancement exist given the combination of a declining TFP and its small share in economic growth. From 1970 to 2011, Indonesia's average economic growth of 5.9 percent came from mostly non-Information Technology (IT) capital and labor at 3.3 and 1.7 percentage points, respectively. A low share of IT capital is not surprising given the use of IT hardware (i.e., computers and copying machines, communication equipment, and computer software)requires a relatively skilled labor force and the large majority of Indonesia's labor force is unskilled labor with low educational attainment and limited knowledge of IT. However, knowledge of IT hardware and software is improving among Indonesians as educational attainment improves and access increases.

FIGURE 4-5

Sources of Economic Growth, 1970-2011



Source: Asian Productivity Organization Database 2013

Moving forward, stimulating productivity growth (labor productivity and TFP) by diffusing the impacts of high productivity activities (i.e., structural change) is imperative to Indonesia's economic growth. However, there is one caveat to improving TFP. The use of technology, especially high technology, will require more educated and skilled workers and, in turn, lead to awidening of labor income inequality. Lee and Wie (2013) found that an increased use of technology in Indonesia leads to a higher demand for skilled labor through a flow of Foreign Direct Investment (FDI) and capital goods imports coming into the country especially after the Asian Financial Crisis (AFC). Skilled workers with high educational attainment and longer work experiences benefit the most from this change. As a result, labor income inequality has been widening since 2000. For example, workers with university degrees experienced a 3.4 percent increase in their real monthly wage, whereas those with lower degrees saw their wages declining substantially between 2003 and 2009. In addition, those with extended work experiences had the smallest decline (-1 percent) in wage compared to the less experienced labor wages which declined from -6.6 percent to -10.3 percent. Reduction of income equality should not be met through adecrease in the production of skilled workers. Instead, this skills "premium"points tothe needforfurther pressure on policies that decrease income inequality and preventa further expansion of the income gap between skilled and unskilled workers.

4.2.2 Rising Income Inequality and Polarization

Indonesia's economic growth thus far has not been inclusive given that most of the population has not benefited from it. According to De Silva and Sumarto (2014) between 2002 and 2012, rich households benefitted the most from economic growth while the poor received only a fraction of the benefits. As a result, Indonesia has become unequal and polarized in terms of incomeand regions, as elaborated

in the previous chapter. High variations in educational attainment of heads of household explain around 37 percent of the overall income inequality.

Since 2000, rising income inequality and polarization at the national and regional level has taken place. These unfavorable trends can potentially lead to increased risk of social unrest and regional disintegration (i.e., political discontent), which will negatively affect future growth. A recent multi-country study suggests that lower inequality is robustly associated with faster and sustained growth given constant levels of redistribution (Ostry et al. 2014). In the context of Indonesia, provinces with initial lower income polarization tended to experience higher subsequent economic growth (Pratama 2014). Rising inequality and polarization is not favorable to economic growth. For example, the rich (who experience a significant increase in their income) prefer to save instead of spend their additional income. As a result, economic growth would stagnate due to a decline in total consumption and output.

Economic growth, as one pillar of sustainable development, must be inclusive to reduce inequality and polarization. There are three main principles to inclusive growth. First, protection of the poor and the vulnerable groups (i.e., population slightly above the national poverty line) from shocks including economic, political and natural disaster. Second, expanding access to basic minimum services across regions including: access to primary health care facilities, primary education, basic sanitation, safe drinking water, nutritious affordable food, and shelter. Access to these basic needs will enhance quality of life and eradicate poverty. Third, the creation and formalization of jobs that pays living wages, instead of minimum wages. A living wage is defined as a wage that is large enough for a worker to afford basic necessities, such as food and shelter, and to live a decent standard of living.All three principles translate into efforts in strengthening and expanding existing social protection programs such as *Jaminan Kesehatan Nasional* (JKN) or national health insurance, *Program Keluarga Harapan* (PKH) or conditional cash transfers;*Program Nasional Pemberdayaan Masyarakat* (PNPM) or national program on community empowerment and other programs.

One fundamental issue is the implementation of development programs. Implementation of development programs often fail due to far too many vested interests, lack of political will and weak coordination among stakeholders despite clear common goals. At the national level, coordination among ministries and government institutions should be improved. Moreover, the social protection system should be fully integrated and able to take advantage of progress in Information, Communication, and Technology (ICT) to minimize exclusion and inclusion errors in beneficiary data that would allow for better targeting and improvement in monitoring and evaluation. Furthermore, development of innovative social protection programs should be encouraged that are tailored to the needs of the poor in various regions rather than existing programs that simply replicate programs fromother developing countries.

Another factor that is likely to exacerbate income inequality is financial liberalization in Indonesia. Ultra-low interest rates in advanced countries have caused global investors to flock into emerging markets, like Indonesia, for higher financial returns. After the global financial crisis in 2008, the size and volatility of flows surged significantly in some emerging Asian economies creating increased financial risks, imbalances and inflating financial asset prices. In addition, the behavior of economic agents haschanged dramatically as they are willing to investmore in risky assets. As a result, rich households that have greater access to these financial markets receive

substantially extra income from returns on their financial assets. This serves to further exacerbate income inequality. Azis (forthcoming) confirms this finding by showing that bank-led inflows, or capital flows intermediated by the banking sector, under the risky behavior scenario actually widens the income gap not only between the rich and the poor but also between rural and urban households. Therefore, macro-prudential policies such as imposing a levy on bank-led flows should be encouraged to maintain stable financial markets and reduce income inequality.

4.2.3 ASEAN Economic Community

In 2003, the signing of the Bali Concord II commemorated the decision of ASEAN countries to take a historic step toward regional integration. One major motivation for integration was the unprecedented negative impact of the Asian Financial Crisis on ASEAN countries. Through the Bali Concord II, ASEAN countries committed to three main pillars: ASEAN Security Community (ASC), ASEAN Economic Community (AEC) and ASEAN Socio-cultural Community (ASCC). The AEC, in particular, was designed to form a single market and production base whilecreating a competitive economic region that is both equitable in economic development and fully integrated into the global economy.

One of the AEC agreements included the free flow of skilled labor. The core argument in this agreement suggests that as many ASEAN countries move up the technological ladder they will need a larger pool of professionals and skilled labor. However, domestic education and training systems are often not able to meet this rising demandthus requiring the hiring of foreign skilled labor. Furthermore, it is assumed that foreign skilled workers are expected to improve the quality and productivity of domestic workers by providing competition, stimulation and synergy.

ASEAN countries have agreed on eight services whereby through Mutual Recognition Arrangements (MRAs), ASEAN countries may recognize the education or experience acquired, requirements met, and licensing or certification granted by other ASEAN countries. These services are limited to include engineering; nursing; architecture; surveying qualifications; tourism professionals; accountancy; medical practitioners; and dental practitioners. Nonetheless, Indonesia is likely to be at disadvantaged position due to a shortage of domestic skilled labor. Many fear that foreign workers will flood into Indonesia leading to a widening of domestic labor income, while others see it as an opportunity for Indonesia to improve its education and training systems to produce the next generation of competitive and productive skilled labor.

To ensure the ASEAN program is consistent with “The Future We Want” for Indonesia and a triple-track sustainable development model,at the regional level the ASEAN economic community (AEC) must be achieved alongsidethe other two pillars of ASEAN communities (ASEAN Political-Security Community and ASEAN Socio-Cultural Community). We should also re-examine the decisionto create the ASEAN Economic Community earlier than the other two communities, as currently planned for 2015. Instead,we should propose a Post-2015 ASEAN Community thatfully integrates the three pillars. Moving forward and in alignment with the United Nations resolution, ASEAN must also focus on sustainable development.

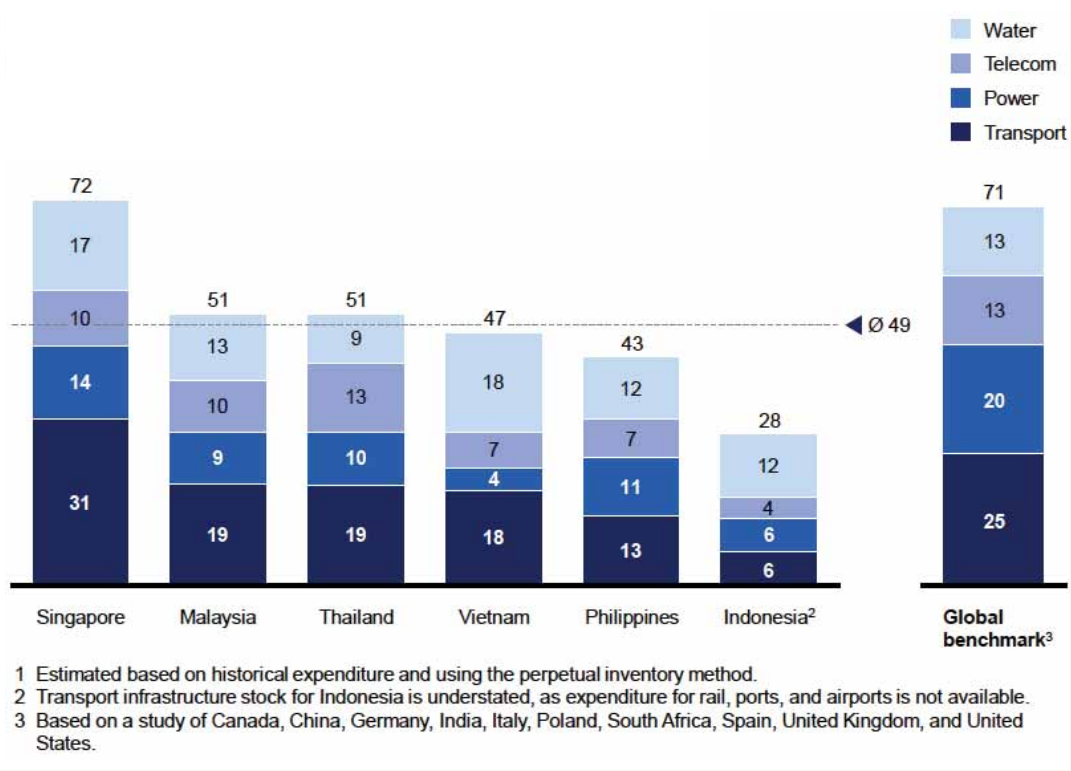
Achievement of the three pillars should also focus on integration within each of the ASEAN countries. For Indonesia, specifically,this is an important issue. For example, is the economy of Borneo well integrated considering it is made up of five provinces in Indonesia, two states in Malaysia, and Brunei Darussalam?Further still, the five Indonesian provinces within Borneo are not well integrated. For instance,

there is no direct flight between the city of Pontianak in West Kalimantan and the city of Banjarmasin in South Kalimantan. Should the people in Pontianak (West Kalimantan) continue to go to Kuching (Sarawak), Jakarta (Java Island), or Surabaya (Java Island) when they really want to go to Banjarmasin (South Kalimantan) but cannot due to poor access? As such, Indonesian cities should aim to be better integrated domestically alongside efforts toward international integration..

Lack of infrastructure development is a major factor hindering Indonesia's sustainable development and competitiveness. Bottlenecks in roads, ports, rail and power impede productivity and growth. Declining investments in total infrastructure has made Indonesia's logistics costs one of the highest in ASEAN at 27 percent of GDP as compared to other ASEAN countries such as Malaysia (13 percent), Singapore (8 percent), Thailand (20 percent) and Vietnam (25 percent) (World Bank 2013). Indonesia's total infrastructure investment declined from an average of 7 percent of GDP in 1995-1997 to 4 percent in recent years. This figure is much lower than investment levels in neighboring countries of Thailand and Vietnam that average more than 7 percent (World Bank 2014). As for level of investments, Indonesia has the lowest infrastructure stock (28 percent of GDP[22]) when compared to other ASEAN countries (Figure 4.6). Indonesia's infrastructure stock is also far below the global average of 70 percent of GDP (McKinsey 2014).

FIGURE 4-6

Infrastructure Stock (% of GDP) of ASEAN and World, 2012



Source: McKinsey Global Institute 2014

22 It should be noted that the estimation of transport infrastructure stock is understated due to the absence of the data.

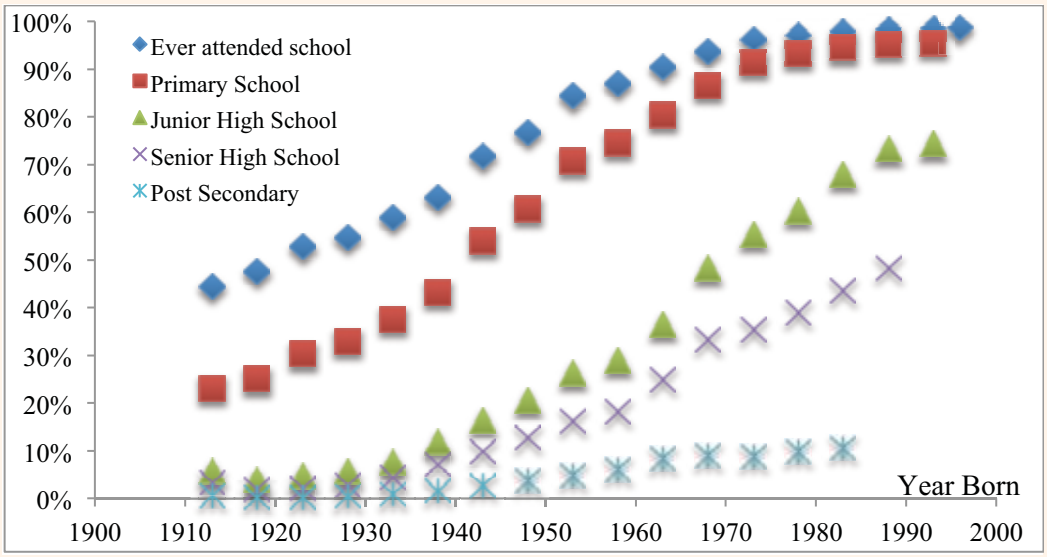
4.3 EDUCATION TO CAPITALIZE ON THE DEMOGRAPHIC BONUS

4.3.1 The Global and Local Challenges of Education

As we enter the new millennium, knowledge capital has replaced physical capital in creating sustainable development. Nations are competing to gain advantages over the new economic regime with each country needing to develop its competitive edge to thrive, or even just to survive. Among others, the development of information and communication technology and the availability of cheap transportation have bridged distances and opened up geo-political barriers between nations to create a freer trade of goods and services. Within industry the rapid development of manufacturing technology and the increased use of automation and information technology have also brought rapid changes tothe labor markettoward a more knowledge-based system. As a result, there isincreased demand for education, especially higher education. At the same time the development in technology and ICT also renders conventional education obsolete. Previously unheard of skills, such as unlearning, relearning, and soft skills are now becoming fundamental, while ICT literacy is considered as important as numeracy, reading and writing.

Over the past decade, education development has emphasized three major issues: Expansion of access, improvement of quality, and strengthening the relevance of education. Since the early 1970's Indonesia has guaranteed by constitution and by law a nine year compulsory education, accessible for all, as a basic human right provided by the government regardless of economic or social background. As a result, in 2008 Indonesia achieved the millenium development goal of ensuring education for all, or at least up to a nine-year compulsory education. By 2010, Indonesia achieved education for all at the basic primary education level with net participation rates in elementary school up to almost 100 percent;96 percent at

FIGURE 4-7
Cohort of School Achievement



Source: Extracted from BPS, various years.

the junior high school level; close to 60 percent at the secondary level; and 25 percent at the tertiary level. Since 2013, the government has prepared to go further moving toward a twelve-year compulsory education system. Indonesia has also shown encouraging results in educational development as farincreasing access to education. According to Figure 4.7, almost 80 percent of children born in the early 1990s finished junior high school and an additional 50 percentwent on to finish senior high school. Despite improvements in access, there remains a high regional and socioeconomic disparity in the quality of education. Efforts to accelerate the expansion of the Indonesian education system must simultaneously aim to improvethe quality and relevance ofthe education received.

There is an expansion of higher education. Moving forward, a knowledge-based sustainable development system requires knowledgeable workers with higher competencies and qualification. This demand will increase the need for access to high quality post-secondary education and drive the increasing trend of higher education enrollment as seen in many developed countries since the early 1970's. Indonesia has also experienced an increase in the demand for higher education as shown by the rise in number of higher education students from less than 250,000 in 1975 to more than 5.3 million in 2013. The higher education needs of students were served by 94 public institutions and more than 3000 private institutions. The gross enrollment ratio to higher education is now close to 28 percent with a more than tenfold increase since 1975. Given the rising importance of higher education in a knowledge-based economy, improving access and equity to higher education is a strategic issue that Indonesia must address. Ensuring relevance of the educational program is also critical to ensure Indonesia's future generation gains the skillset they need to participate in a high productivity economy.

4.3.2 The Structure of Economy and Employment

One difficult question in education development is finding the right balance between vocational/industry-oriented education and academic training. To address this question, we can turn to the three dimensions (economic, social, and environment) of sustainable development for guidance.

Unfortunately, no theory exists to gauge progress in the transition toward sustainable development as the issue of sustainable development is relatively new. Economic literature points to one theory of economic transformation by Chanery where it is argued that development begins in a state where most people work in agriculture and the agricultural sectoris the major contributorto GDP. As development progresses, people move toward industrial sectors, both in employment and GDP. The final stage of development finds a shift tothe service sector in terms of employment and GDP.However, this theory has some weaknesses,including a lack of attention to the social and environmental aspects of development. Existingtheories of economic transformation have not been concerned with sustainable development and thus fail to provide a roadmap for development.

Given the absence of a comprehensive theory of transformation on the triple-track of sustainable development, the following discussion focuses on the conventional theory of economic transformation. Seen from the lens ofeconomic transformation theory, Indonesia's economic structure hasbeen experiencing a slow but consistent shift toward manufacturing and service sectors in the past decades. Contributions from the agriculture sector went down from 45 percent in 1970 to 14 percent in 2013, whereas contributions from industry increased from 8 percent to 24 percent

over the same period(Table 4.2).Unlike neighboring countries, the movement of workers out of the agriculture sector(the least productive of sectors) has stalled around 42 percent since the economic crisis in 1998 (Figure 4.8).

At this point, it is not clear the kind of economic transformation Indonesia wants to achieve.Does Indonesia want to proceed from an agricultural society, to industrial, and end up as a service economy? When considering food security issues, would a decline in the contribution of agriculture be good or bad for an economy?And questions remain about the environmental cost of economic growthin terms of air and water quality, the two vital components of human survival.

TABLE 4-2

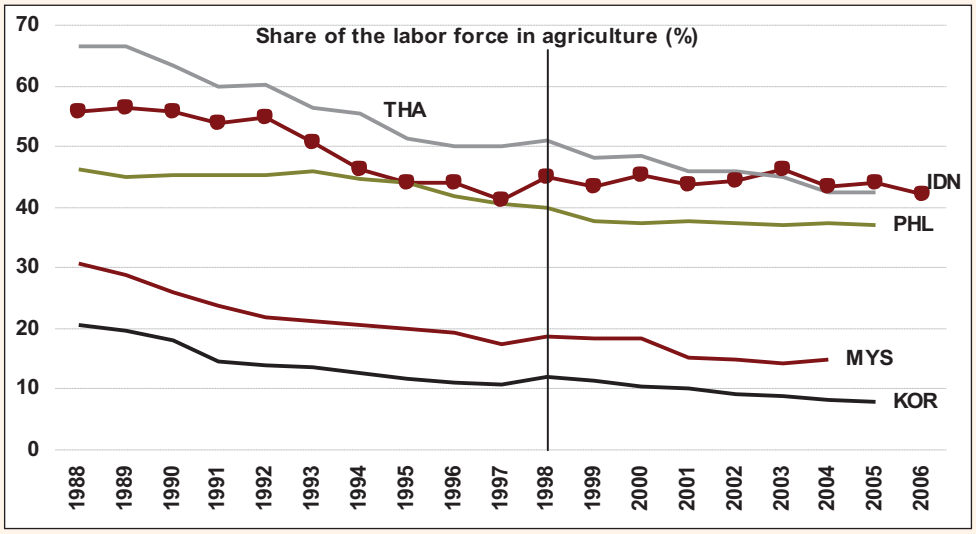
Contribution of Economic Sectors to GDP

Sector	1971	1990	2005	2010	2013
Agriculture	44.8	21.5	15.3	15.3	14.4
Mining	8	13.4	9	10.6	11.2
Industry/manufacture	8.4	19.9	28	26.4	23.7
Electricity, gas, water	0.5	0.6	1	0.8	0.8
Construction	3.5	5.5	5.9	9.9	10
Trade	16.1	16.9	16.1	13.3	14.3
Transportation and Communication	4.4	5.6	6.2	6.3	7
Banking and Finance	1.2	4.2	8.4	7.2	7.5
Other services	10.7	9.8	10.1	10.2	11
Total	100	100	100	100	100

Source: Extracted from BPS, various years

FIGURE 4-8

Share of workers in agriculture (%) in Indonesia, Philippines, Thailand, Malaysia, and South Korea

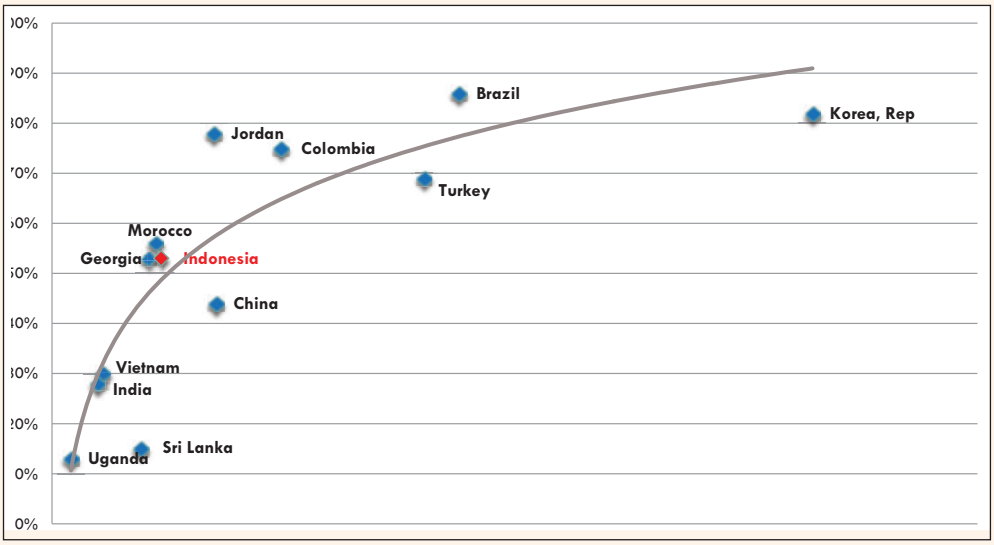


Source: WB Country Report, 2008

Statistics show that workers in the agriculture sector are mostly low-paid and poorly educated labor that are only suitable for low value-added industries. As such, it is difficult for these workers to produce high value-added products. A recent national survey indicated the number of marginal farmers is decreasing with anaccompanying trend of increased urbanization. This migration of rural populations to urban areasmay bedue to the poor livelihood from marginal farming and the changing aspirations of the new and better educated generationseeking better employment opportunities in the urban economy. Between 1990 and 2014, the annual growth rate of urban population in Indonesia was relatively high, 3.74 percentannually (United Nations, Department of Economic and Social Affairs, Population Division (2014). Urbanization often accelerates economic growth due to the co-location of economic activity and population density as seen in Figure 4.8 that shows us a positive correlation between urban population and GDP per capita.

FIGURE 4-9

Urbanization and GDP per capita in selected countries



Source: Planning, Connecting, and Financing Cities. World Bank 2013

Despite the typical positive correlation between urbanization and GDP, urbanization in Indonesia has not been followed by a significant increase in per capita GDP. This may be partially explained bythe urbanization of migrants moving in from rural areaswithout the necessary training and competency of urban industries and other modern economic sectors. In other words, urbanization has only shifted the poor population from rural areas to the urban areas, or moved a low productivity sector in rural areas to become a low productivity sector in urban areas. Given the approaching demographic dividend, urbanization issues must be addressed tofully capitalize on high population density and the formation of triple-track sustainable development.

As the economy shifts toward the manufacturing and service sectors, there is increased demand for more skilled and ICT literate workers. To fulfill this demand, education must be expandedat all levels and kept relevant with the changing demandsof economic development. AsIndonesia is progressing from a commercial economy to an emerging-market economy, the education system must supply

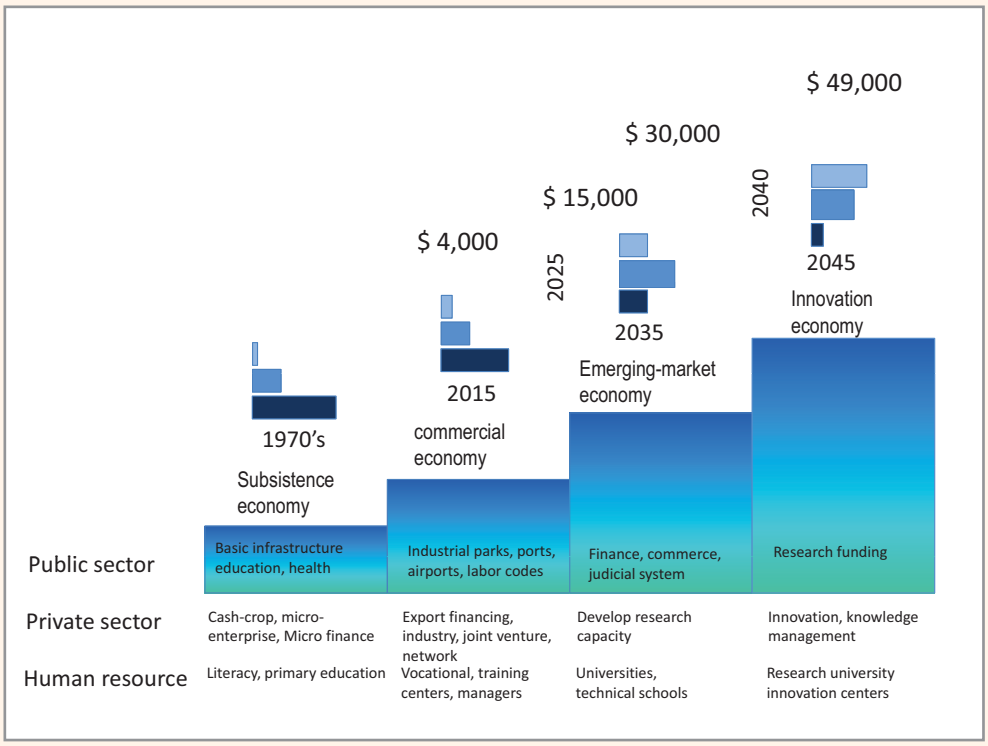
the neccesary workforce to satisfy the demands of the new economy. Ideally, educational curriculmcan also be aligned with the future need for a triple track sustainable development pathway.

4.3.3 Climbing the Development Ladder

Indonesia's first stage of development is to escape the lower-middle income trap. Currently, the Indonesianeconomy is characterized by a commercial economy with a per capita GDP of US$ 5,519 in 2013 (1990 PPP). By building development momentum, Indonesia can avoid theupper middle-income trap and climb the development ladder to become an emerging market economy with an income per capita of almost US$ 15,000 by 2030, assuming a 7 percent economic growth rate (Figure 4.10).However, achievement of this higher per capita income must not occur at the expense of sustainable development principles. Instead, it should be achieved through the development of a critical mass of a skill-intensive workforce. In addition, Indonesia has to strengthen its industrial base by emphasizing light-industries. For example, Indonesia can be the home base for multinational industries relying on raw materials and a skillful work force, such as food industries, garment and textiles, consumer goods, and the automotive industry. Indonesia should take advantage of the aging Asian economic giants and capitalize on its demographic dividend by creating a competitive industrial base for Asia. For instance, Indonesia can rebrand itself as the manufacturer of Asia andlet this unifying theme take them forward for the next 10 years of economic development. Three critical factors must be considered to achieve this initial stage of development. First,Indonesia must strengthen their industry and economic competitiveness through development of a skillful and competitive workforce. Second,agood business environment must be created to attract foreign direct investment and encourage national savings to be invested in industries. Finally, sustainable development goals should guide Indonesia's future development decisions.

FIGURE 4-10

Climbing the Development Ladder



After the abovementioned steps have taken place, the next stage of development is for Indonesia to become a mature market economy by 2035 while preparing for an innovation driven economy by 2045 (Figure 4.10).In anticipation of reaching an innovation driven economy in the future, Indonesia must start investing in research and development (R & D) today, particularly in areas that emphasize a sustainable green economy. For example, R & D investments should aim to create added value for Indonesia's existing natural resources, such as marine and megafaunadiversity. Finally, it is inevitable that marine-based development should be the backbone of Indonesia's future sustainable developmentgiven that over 70 percent of Indonesia'sterritories are islands.

4.3.4 The Structure of Education

With the demographic dividend in mind, Indonesia has to capitalize on this population bonus by improving the productivity of its citizens. Currently 63 percent of the working-age population works in informal sectors. In addition, almost 92 percent are working in small and medium enterprises, including self-employment, with limited skills due to low educational attainment. Most of Indonesia'sworkforce works in semi-skilled fields such as construction, transportation, plantations, services, tourism, and low-level manufacturing. As we enter theASEAN Free Trade Area (AFTA), the competitiveness of the semi-skilled workforce must be strengthenedto compete with the increasing flow of foreign skilled, semi-skilled, and low skilled workers freely entering Indonesia to work. To prepare, industry-certified non-formal trainings should be developed to upgrade workers that have only achieved a primary school level education and currently make up around 50 percent of the workforce. The certified non-formal trainings should be linked with industry, or directly related to regional development needsof the government. Government should encourage industries and business sectors to developtraining centers by providing financial incentives (tax deductions or exemptions) based on the number of workers absorbed or improvementsin the work force.

Formal education has a role to play too. For instance, Technical and Vocational High Schools (TVS) can be strengthened and linked closer with industry. Industry-based TVS should be developed in all industrial clusters, including agro-based industries. Indonesia can adapt the German model of industrial-based TVS to avoid having unemployed TVS graduates with specialized skills that find it difficult to adopt new skills.

Higher education has a challenging but critical role to play in producing graduates to meet the demand in new workers and to generate fresh innovation from its research that can contribute to economic development.

4.3.5 Towards a New Agenda

In the near future, challenges to higher education institutions (HEIs) in Indonesia will remain.On the one hand, globalization forces HEIs to adapt to international demand and standards. While at the same time, regional autonomy and development requires HEIs to respond with immediate relevance to the local society. Higher education must strike a delicate balance between these two forces by providing students with a broad foundation that is adaptive to a changing job market, while also providing relevant and often specific skills needed for local development. The global mobility of the workforce requires students to understand international issues and forces

higher education institutions to develop more international collaborations while maintaining close relationships with local stakeholders. At the international and local level, higher education institutions must be centered on achieving triple-track sustainable development for the achievement of "The Future We Want."

In the near future, agriculture will remain the dominant sector to the labor market. Higher education can provide graduates and innovative research that will increase the added value and productivity of this sector. Most importantly, the agriculture sector and HEIs should work together toprovide healthy and nutritious food for all Indonesians.As a country endowed with natural resources, Indonesia's higher education graduates can be at the forefront of promoting the sustainable use of natural resources through the use of renewables. Indonesia's graduates can lead the wayby understanding global issues and recognizing the importance of sustainable development along withthe use of local wisdom and indigenous knowledge to address those issues.

To meet the diverse needs of the job market higher education institutions must differentiate their missions. Per capita productivity in all sectors is still relatively low and needs improvement through high quality post-secondary education. The traditional manufacturing sector will continue to grow with industrialized countries shifting their plants to new countries to uphold a labor and production cost advantage. This translates into continuous increases in the demand for skilled workers to be supplied by polytechnics and other vocational training institutes. Alongside manufacturing, increases in the service sector and the emerging creative industry will provide ample room for graduates with more generic skills, ICT literacy, and access to global knowledge. ICT literacy is not only vital in today's globalized economy, but also allows students to tap into global knowledge and resources. This emerging sector is rapidly changing and will need graduates to continuously learn as new technology and developments take shape. Softer skills, such as entreprenurship and leadership, are increasing important skillsets that need to be incorporated into higher education systems using innovative and often unconventional teaching methods.

4.3.6 Transition from School to Work

Educational attainment often indicates the age a person left school to enter the labour market and is a good predictor offuture job and career opportunities. The school-to-work transition for youth is a difficult one that is not as simple as leaving school, finding a job and enjoying the income. Youth often lack knowledge about labour market opportunities and are unaware of their career prospects. As such, this demographic needs guidance and information on the labour market to ease this transition.

In 2003, the Indonesian school-to-work transition survey (ISTWS) was jointly organised bythe International Labor Organization (ILO) and the Ministry of Manpower and Transmigration (MOMT)[23]. The survey interviewed 2,180 youth between the ages of 15-24 years old and 90 enterprises across three provinces of Jakarta, Central Java and East Nusa Tenggara. One key finding is that many youth entered the labour market at an early age and were unprepared for it. The survey shows around 28 percent of the respondents started looking for a job before the age of 18, while the majority(55 percent)starting looking between the ages of 18

23 This survey provides insight into the transition from school to work in Indonesia (See Sziraczki and Reerink 2004 for the full report).

and 21. Only 17 percent of respondents starting looking for a job once they were older than 21. Another important characteristic emerging is that young workers are very mobile. One in four job seekers was willing to move to find a job in another place within the country or even overseas. It is not surprising to find that around half of them areinternal migrants. It is expected that an even larger scale of young international migrantsis expected in the years to come. In preparation,itis necessary to give Indonesian youthmore information and assistance on job searches, as well as provide other support networks that can facilitate their transition. This new generation of youth will be experiencing multiple transitions at the same time from school to work, leaving their home and parents to live alone, andpotentially transitioning from one location to another. All of these transitions will require their physical and psychological readiness.

This study also found that many respondents prefer to engage in entrepreneurship. From apolicy perspective this means schools shouldaim to provide social and economic encouragement to build a culture of entrepreneurship. The creation of small and medium enterprises can also potentially employ many more additional young workers.

4.3.7 Knowledge-based Sustainable Development

Knowledge-based sustainable development uses knowledge to increase productivity, to eliminate capability deprivation, to create energy, food, water and air security, and to establish justice including the elimination ofpoverty andestablishment of principles of good governance. Knowledge-based sustainable development also means the free flow of information including access to truthful sources of information and the ability of citizens to analyze and evaluate media discourse as well as create their own messages.

The use of information and technology (IT) is critical to knowledge-based development. IThelps create and disseminate knowledge from small-scale production information in a factory to a larger scale in facilitating understanding about society, healthy lifestylea and environmentally friendly behavior. This new development framework can use traditional media and new Information and Communication Technology (ICT) as tools for access to information but also as mechanisms for participation and civic engagement.Increasingly, the use of STEM (Science, Technology, Engineering, and Mathematics) is crucial to economic development and therefore literacy of IT becomes fundamental to the achievement of sustainable development. Utilization of the social sciences and humanitiescan supplement STEM to ensure alignment with the goals of sustainable development.

In the twenty-first century, skills to survive in the labor market can be challenging and dynamic. Trilling and Fadel (2011) classified these skills into three major categories: life and career skills, learning and innovation skills, and information, media, and technology skills. First, our children must be equipped with the skills to live and develop their careers. Given the highly dynamic and challenging labor market, flexibility and adaptability become key competencies to survive and exist. To remain competitive, productivity, initiative and leadership are needed along with cross-cultural skills to survive in a globalized economy. In our increasingly digital world, digital literacy becomes the minimum ticket to enter the labor market. Learning skills also become fundamental. Trilling and Fadel (2011) articulate four key learning skills, referred to as 4C,that include critical thinking & problem solving, creativity & innovation, communication, and collaboration skills. Our education

system must be prepared to teach these new skillsdepending on the goals of each level and the type of education.

In Indonesia, the high youth unemployment rate alongside a growing younger population results in the current population composition not contributing to the overall Total Factor Productivity (TFP) of society. This unsettling trend presents a risk that Indonesia willfall into the middle-income trap. It therefore becomes increasingly important to emphasize the development of a knowledge-based society that is supported by a combination of STEM and liberal arts.Education development in this direction enables Indonesia to create a knowledge environment that raisesthe nation's total productivity. In addition, a knowledge-based society is necessary to face the negative impacts of unsustainable development from climate change to a loss of biodiversity. Food and energy security also become two major challenges to social stability.

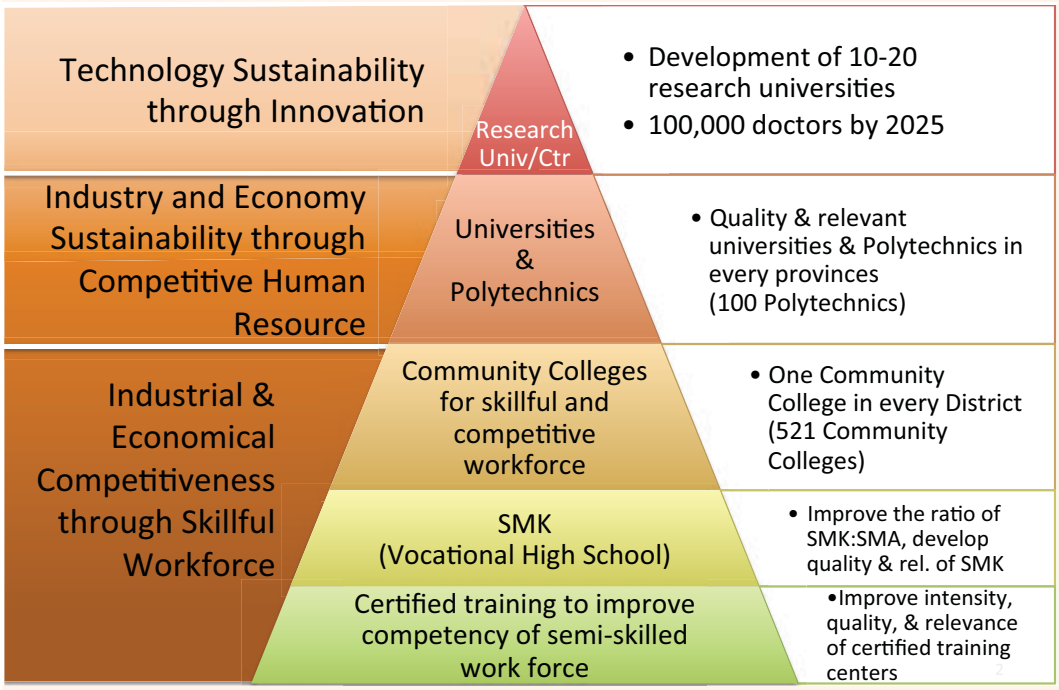
Familiarity with STEM, combined with liberal arts and local wisdom, should be encouraged since early age. STEM development in Indonesia has not been be a primary concern for policymakers as reflected in Indonesia's poor performance in international student assessments, such as PISA and TIMMS, with Indonesian students scoring very low in math, science and reading.Studies on STEM in Indonesia are scarce, however other countries offer important lessons. According to the U.S. Department of Labor, 15 out of the 20 fastest growing jobs require significant science or mathematics to successfully compete for a job. The increase in the number of STEM jobs in the U.S is remarkable and so is the financial compensation. Typically, salaries of STEM job workers are higher than those of non-STEM job workers. For example, it is projected that the demand for biomedical engineers, medical scientists and system software developers will increase 63 percent, 36 percent and 32 percent, respectively, between 2010 and 2020. Despite STEM's attractiveness in the job market, interest in STEM remains low as indicated by low enrollment in STEM majors. In the case of Indonesia, poor performance in international tests and the rising demand for STEM workers justifies an urgent need to focus on the development of STEM from an early age, in combination with liberal arts and local wisdom.

Currently, the percentage of higher education graduates in Indonesia is dominated by the social sciences. However, to prepare the workforce to be industry-ready priorities must be set for hard sciences, such as engineering and agriculture, including the agro industry. Moving forward, Indonesia will continue to need infrastructure development to drive the economy, however, in 2010 Indonesia had only 2,671 engineers for every one million people. This figure is very low compared to South Korea (25,309), or even other Southeast Asian countries like Malaysia (3,333) and Thailand (4,121). The two most populous countries in the world, China and India, each havea higher density of engineers per million people when compared to Indonesia at 5,730 and 3,380, respectively.

As mentioned previously, social sciences and teaching dominate the profile of tertiary education students in Indonesia. In 2013, only 12 percent of students took engineering and 4 percent took science. By 2035, the proportion of hard science students should be increased to at least 25 percent of the student body, and science alone needs to be increased to 10 percent (Figure 4.11). The top end of human resource development, indicated in red in Figure 4.11, must fill the need for innovation, as every developed economy mustbe supported by strong research and development to innovate and sustain economic growth.

FIGURE 4-11

General Plan of Education Development To Meet Economic Development



Source: Authors' illustration

Currently, the percentage of Indonesian PhD holders in the population is very low. In the next two decades, these numbers must be at least quadrupled to drive the necessary R&D that leads to significant innovation. Estimates suggest innovation needs a critical mass of at least 100,000 PhDs across various fields. Investments must be made directly toR&D and the training of PhDsdomestically and abroad. In addition, a significant proportion of the research conducted by PhD students should be linked to the needs of industry and society with a particular emphasison hard sciences and agriculture.

One strategy Indonesia can employ in their triple-track development pathway is the use of knowledge management (KM). Knowledge management is defined as "the process of capturing, distributing, and effectively using knowledge." (Davenport 1994). KM utilizes a multi-disciplinary approach to achieve organizational and institutional objectives. MainstreamingKM in both private and public sectorsstimulates creativity, spurs innovation and creates new knowledge leading toimprovements in both TFP and labor productivity growth. However, this mainstreaming process is a challenge in policy design, formulation, implementation, and monitoring and evaluation. The success of a KM approach is dependent on "big picture" thinking and strong leadership.

Knowledge management is a relatively new concept. First introduced by Nonaka (1991),he started by differentiatingbetween tacit and explicit knowledge. Tacit knowledge is the "know-how" based on personal life experiences and is oftendifficult to formalize and communicate. This type of knowledge includes ideas, emotions, experience, beliefs, values, ideals, and intuition. Explicit knowledge, on the other hand, is formal, systematic and easy to communicate. Formal education is an example of explicit knowledge. Other dimensions of explicit knowledge

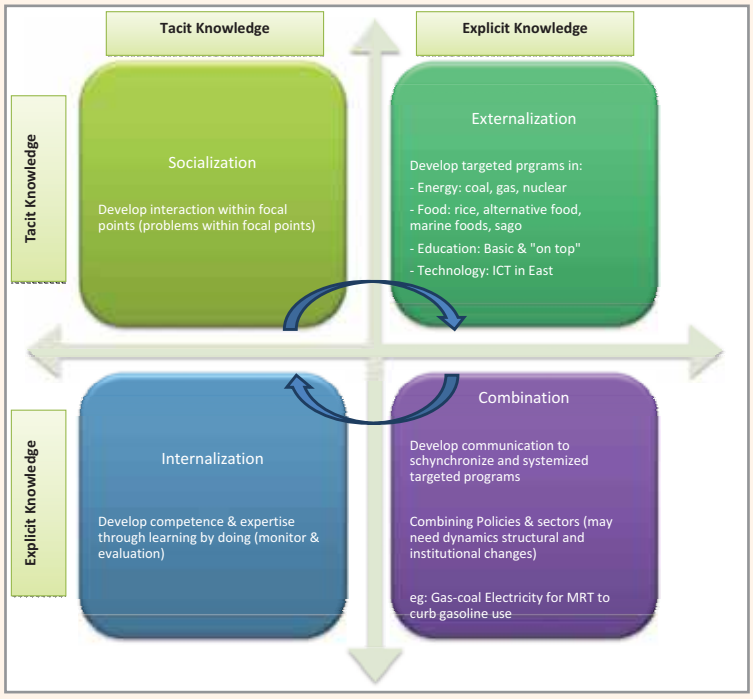
include culture, organization, process, learning, relationship, technologies, action objectives, and leadership.

The knowledge management process consists of four stages known as Socialization, Externalization, Combination and Internalization (SECI). Knowledge goes through these stages, ultimately forming a "spiral of knowledge" and resulting in new knowledge that is valuable to a company, institution or country. Knowledge management can be used to achieve Indonesia's main objectives such as energy and food security, improvement of human capital through education, and improving access to Information Communication and Technology (ICT) in the Eastern part of Indonesia.Figure 4.12provides a visual illustration of the SECI model.

In the first stage of Socialization, government leads experts, scientists, and related stakeholders to identify key issues in each sector. The tacit knowledge of individuals in this group is shared and discussed. In this way, issues emerge from each sector, for example:(1) low domestic food production resulting in high food imports and low food diversification (i.e., food security); (2) underutilization of coal and gas and renewable energy as domestic sources of electricity (i.e., energy security); (3) skills gap in the job market (i.e., education); (4) low internet access in Eastern Indonesia (i.e., ICT).

FIGURE 4-12

The SECI Model



Source: Authors' Illustration based on Nonaka (1991)

The next stage moves stakeholders from tacit to explicit knowledge. In this Externalization phase, the group articulates specific visions and develops targeted programs. New ideas and solutions are strongly encouraged in this stage. For instance, the visionemerged to develop a marine-based food industry in the Eastern regions - an area rich in terrestrial and marine natural resources. Resource enrichment can be cultivated such as seaweed, unagi, and canned fish. These specialty items could be combined with local staple foods such as sago, which is

abundant in Eastern Indonesia, and industry could produceinstant noodlesmade from sago. Additional resource enrichment activities demand more electricity and as a result there is an urgent need to build more power plants using coal, gas, or renewable energy depending on regional availability. In response, an energy industry must develop in the region. However, measures must be made to reduce the negative environmental impact of this new industry, for example, a coal-based power plant can use a carbon capture storage (CCS) technology.

The specialized labor demand of the food and energy sectorsrequires local education systems to adapt and satisfy this new demand. Training centers can be constructed to teach the necessary skills and Internet access increased to allow for up-to-date information on food prices, consumer demand, and market research. In this stage the team standardizes knowledge, puts it together in an action plan andsynchronizes targeted programs. The government plays a key role here by combining policies and sectors that are in need of structural and institutional changes.

Finally, the last stage of implementation is a "learning by doing" process whereby the team gains competency and expertise, also referred to as Internalization. At this point the team better understands major issues and are set to solve these problems with a combination of knowledge thereby creating new knowledge. After this internalization process is completed the spiral of knowledge starts all over again at a higher level.

KM thrives in a positive and conducive knowledge environment. Factors that may influence KM uptake include the length of knowledge cycles, variety of knowledge needed, level of standardization and geographical concentration. For instance,food and energy industries have a long knowledge cycle, in other words, it takesa long time to gain new knowledge in these sectors. In contrast, new knowledge in mobile technology is generated in onlya short time. Given that mobile phone technology has a short product cycle and will be obsolete in only two to three years, it is critical to this industry that new knowledge gets generated quickly. Beside differences in timeframe, food and energy industriesalso have low knowledge variety when compared other industries. The auto industry, for example, requires knowledge in mechanical engineering, electrical engineering, mechanization, material engineering, and design. The food and energy industry also tend to be standardized and geographically concentrated, therefore, specific strategic knowledge creations include merger and acquisition (M&A), internal R&D, and alliance building. For example, China is currently employingthis strategy to meet its large and growing population demand for food and energy by aggressively conducting merger and acquisitions of international food and energy companies. These strategies result in the acceleration ofthe knowledge creation process.

Higher education institutions, such as universities, can serve as the center of knowledge management. They can play an important role in creating tacit and explicit knowledge (i.e., applying knowledge management) to solve future challenges through the promotion of "Tri Dharma University," or fulfillment of these three higher education institutions' obligations of teaching, research and development (R&D), and community engagement. Formal education on campuses contributes to the explicit knowledge of students, while research and development creates new knowledge that expands the tacit and explicit knowledge of researchers. Community engagement requirements, such as helping villages, will enrich students' life experiences and broaden their horizons thus enhancing their tacit knowledge. Society as a whole will benefit from the positive outcomes of KM if higher education

institutions can effectively diffuse, share, and transfer this knowledge to the entire society. As a result, higher education institutions can contribute significantly to the attainment of sustainable development by spearheading efforts in mainstreaming and applying KM.

In summary,Indonesia should promote a productivity-led, inclusive and sustainable growth model in the context of sustainable development. By utilizing favorable demographic trends, Indonesia can address key issues of the middle-income trap, low productivity, and the ASEAN Economic Community. It can be said that Indonesia needs to "grow rich before growing old" with the understanding that thisgrowth must emphasize raising productivity, sharing prosperity and continuous growth with minimal impacts on the environment. With the help of the right policies, Indonesia can be on its way to achieve the "Future We Want."

4.3.8 Other Strategies to Support Productivity and Competitiveness

Given the importance of raising productivity and competitiveness, multiple strategies must be employed.First, a reallocation of workers and capital from low to high productivity activities or sectors will be a key driver of development (Mcmillan and Rodrick 2011). Identifying and diffusing these high productivity activities across Indonesia's economy becomes critical for its development. This process is widely known as structural transformations, or the presence of an integrated, comprehensive and systematized industrial policy. An industrial policy in Indonesia is urgently needed as a means to nudge the diffusion of high productivity activities to the rest of economy; however, this policyshould not favor and protect any particular industry. For instance, Indonesia's manufacturing sector is less connected to the global supply chain than neighboring countries.However, Indonesia continues to actively invite FDIs in the global supply chain despite the fact that it has not succeeded. One suggestion to attract FDIs is by providing an Export Processing Zone (EPZ) that favors export-oriented firms through fiscal and non-fiscal incentives. Giventhat Indonesia is a large archipelago, an EPZ can start as a small pilot project in selected locations with the potential for the government to scale it up to other regions, particularly Eastern Indonesia. However, this is not a revolutionary idea. The Indonesian government builtan EPZ in Batam that ultimately failed. Moving forward, a comprehensive study should be conducted to analyzethe factors that led to the failure of the EPZ in Batam.

Second, sectoral productivity can be promoted through a combination of effective and efficient use of capital, high quality workers and optimal production methods using new knowledge that enhances overall productivity (Mcmillan and Rodrick 2011). For example, organic farming often leads to higher yields, sustained positive environment impacts and optimal use of factor production.

Third, improving connectivity through an integration of the transport system and investment in infrastructure is critical. Indonesia currently experiences an infrastructure deficit due tolow, and declining, infrastructure spending. Indonesia only spent around 3-4 percent of GDP on infrastructure in recent years,compared to other countries like China and India that spent 10 percent and 7.5 percent, respectively (World Bank 2014). One popular argument suggests the state budget misallocation for energy subsidies, particularly fuel subsidies, should be reduced because it is untargeted and a major source of "twin deficit" (i.e., current account and budget deficit). In turn, the savings from the reduced subsidy can be used

toward infrastructure development. Regardless, infrastructure development is imperative to improve connectivity across Indonesia, especially between western and eastern Indonesia. An integrated transport system combining land, sea, and air will lower logistics costs and reduce regional price disparities.

Fourth,amix of fiscal, monetary and other policies is needed to support a sustainable development investment climate. In mid-2013, firms in Indonesia faced great uncertainty due to external and domestic economic shocks. As the US Fed announced its plan to gradually reduce its quantitative easing, the U.S economy slowly recovered from recession. This announcement resulted in massive capital flight out of Indonesia, a plunge in the stock market index, and a highly depreciated Rupiah against the USD. Meanwhile, the government decision to cut fuel subsidies led to high inflation. Furthermore, lower global demand for commodities and high levels of imported goods exacerbated Indonesia's current account deficit. Responding to this mini-crisis, the government developed policy packages to maintain fiscal stability, reduce imports and inflation, and lower the current account deficit. Meanwhile, the Bank of Indonesia increased its benchmark rate and stabilized the Rupiah to the USD exchange rate. This coordination should be strengthened in the future to manage internal and external risks and further supportan investment-friendly climate for sustainable development. The government and the Bank of Indonesia need to design mechanisms to prevent and mitigate the negative impacts of future economic shocks.

Fifth, a reward and punishment mechanism at the sub-national level is needed to encourage local governments to promote productivity-led, inclusive and sustainable growth in their regions. This requires the central government to assist in local government capacity building. For example, Village Law No. 6 2014 will disburse around USD$ 100,000 to around 72,000 villages,butimplementation is a challenge given the high variation in local leaders' capacity and capability. However, if given clear and easy to understand principles to manage their resources, this challenge also provides a great opportunity for the lower public administrative levels to participate furtherin developing their areas.

Sixth, the rich and most advantaged groups should contribute more to Indonesia's development by paying taxes according to their total income (i.e., labor and capital incomes). By doing so, Indonesia's tax ratio, which has been historically very low at around 12 percent, could be improved. However, this assumes the tax revenues are used for improving productivity through high quality investments in infrastructure and human capital. Anotherstrategy to raise the tax ratio is to add more tax collection officials to increase the ratio of officials to taxpayers. A lack of tax collection officials has contributed to Indonesia's poor performance in tax collection. A third way is to create bilateral agreements with tax haven countries to collect taxes from people who have been avoiding taxes (i.e., tax evasion).

5

Setting the Future We Want

In this study, we examined the link between population dynamics and sustainable development. Indonesia's population size, composition, and distribution will have a profound impact on the country's development. Significant changes are needed to move away from the established GDP-oriented development approach and towards a more inclusive, productivity-led, and sustainable form of development. A sustainable development approach is not only motivated by raising production and consumption levels, it also takes into consideration the needs of the current and future generation, as well natural resource use within the boundaries of nature's biological capacity, or biocapacity. The current resource-exploitative development approach should instead be changed to a resource-enrichment approach by increasing the value-add of natural resources within theirbiocapacity.

The need for changing the development orientation is clear. However, without a deliberate and inclusive development policy, current growth patterns will perpetuate existing development imbalances betweenthe heavily populated WesternIndonesia and the less populated Eastern Indonesia. These growth patterns willalso exacerbateregional disparities between districts (*kabupaten*), within provinces, and between urban and rural areas. Yet disparities can be avoided, or at least minimized, by adopting a development model that pursues inclusiveness and emphasizes raising productivity through human capital development. Human capital, and the development of, is seen as the main force of productivity-led sustainable development.

Indonesia will face an additional 41 million people and a total population of 296.4 million by 2030. Large population numbers present major challenges including the provision of fresh and safe water, clean air, healthy and nutritious food, affordable energy, and improving public goods and services such as health and education. By 2030, the majority of Indonesia's population will continue to live in the western regions of Indonesia with the largest concentration on Java Island. Future population distributions will look similar to the current distribution patterns, except that by 2030 most of Java will be urbanized. Java's urbanization rates show that by 2030 the following patterns emerge: Jakarta will remain 100 percent urbanized, and urban areas will develop in 80 percent of West Java and Yogyakarta, and 57-62 percent of Central and East Java. Overall, 63.4 percent of Indonesia's population will live in urban areas by 2030 (Bappenas, BPS, UNFPA 2013). More people living in urban areas, especially on Java, will put pressure on existing systems (i.e. goods, services, infrastructure) and require an expansion in access to basic infrastructure such as affordable housing, healthcare facilities, reliable and inexpensive transportation systems based on renewable energy, reasonably priced energy, open spaces and green parks for social interactions, and waste management. Ensuring this population group engages in sustainable production and consumption will also contribute positively to sustainable development. The overall improvement in the wellbeing of urban populations will play a role in their family planning decisions.

Productivity is an important link between population dynamics and sustainable development. A rise in the number of working age population corresponds to an increase in urban workers. For Indonesia to truly benefit from this trend workers must be equipped with the knowledge, skills and training to find decent jobs rather than low productivity and low wage service sector employment. Indonesia is presented with the opportunity to reap the benefits of this demographic bonus should the appropriate policy measures exist to build sustainable and human capital development. However, there is an urgency to act now with the United Nations

population projections dictating the presence of a brief demographic window of opportunity from 2020-2040 (UN 2012 revision).

The annual growth rate of Indonesia's older population (60 years and above) is also of critical importance. By comparison, this demographic will experience the fastest growth boasting an average annual growth rate of 4.24 percent between 2015-2030. This figure stands in stark contrast to the 1.1 percent average growth of the total population. Alongside a trend of increasing life expectancy, an increase in the dependency ratio and the associated financial costs will be some of Indonesia's most prominent issues for 2030. As we move toward sustainable development, Indonesia must promote active aging to encourage older persons to remain healthy, independent, and an active part of society.

The opportunity for capitalizing on the demographic bonus and the trend of an aging population are critical to Indonesia's future. As such, all policy-making decisions related to sustainable development must take these issues into consideration. Policymakers must take a long-term view and consider investment strategies and financing options that will guide Indonesia toward sustainable development. In the immediate to long term, the government must create and promote decent jobs to absorb an increasing supply of labor. Raising productivity also becomes an urgent task to avoid the middle-income trap (MIT), reduce rising inequality and polarization, and face the ASEAN Economic Community. Capacity building through knowledge management will continue to play an important role in increasing total productivity. Knowledge management will also serve to stimulate creativity that will produce innovation for an enhancing standard of living.

Based on these considerations, we start by emphasizing the importance of maintaining a population age structure conducive to supporting sustainable development. Next, we focus on the strategic factors of population dynamics that serve as a bridge towards sustainable development. Finally, we propose strategies that support inclusive, productivity-led sustainable development. In addition, all suggestions aim to incorporate principles of good governance and justice in accordance with a rights based approach.

Based on the above-mentioned considerations and our analysis, we propose the following recommendations categorized under the following topics:

I. Maintaining A Productive Age Structure;
II. Creating and Improving Productive and Decent Jobs;
III. Promoting Inclusive and Productivity-led Sustainable Development.

Each of these categories consist of the following suggestions:

I. Maintaining A Productive Age Structure

- Expandingthe family planning paradigm toward planning a healthy and prosperous family using a rational and rights-based approach. Under this paradigm, people should be aware of their rights to control and space their births. In addition, by reducing, or eliminating, the unmet need for family planning there is a reductionin the feeling of injustice in the society which can help maintain a favourable age structure for sustainable development.

- Undergoing a reorientation of the health sector from a curative approach to a preventive and promotive approach by educating people about healthy lifestyles, includinghealth promotion and environmentally friendly behavior.

Promotion of healthy lifestyle may alsoinclude education on sexual and reproductive health and rights for all people regardless of age and gender. Continued efforts toward a healthy lifestyle must also reduce mortality and morbidity for all ages with aparticular focus on reducing maternal mortality.

- Improving access and participation of disabled people in society through inclusive education, as well as development of disabled and age friendly cities (e.g., public housing, transportation). Provision of infrastructure for the disabled and promotion of compassionate care-giving industries (e.g., retirement home, care-givers for the elderly) must also be prioritized.

- Ensuring youth are guaranteed particular freedoms, such as freedom from ignorance, disease, and fear. As well as promotion of freedoms to be mobile, to participate, and engage in environmentally friendly behavior.As the future generation of workers, youth must also beeducated onhow to create justice because they will soon become the main supporters of the economy.

II. Creating and Improving Productive and Decent Jobs

- Accelerating the expansion of our education system while improving the quality and relevance of education. Improving access and equity to higher education to increase the number of skilled workers and prepare them with higher levels of competency and qualifications. By adopting the educational attainment structure of more developed countries, Indonesia may be able to transform its own system.

- Ensuring the education system is aligned with the demands of the labor market in terms of content, quality and subject area. In addition, incorporate the concept of sustainable development into the eduction system through curriculum development, for example.

- Encouraging industry and the business sector to develop certified training centers by providing financial incentives based on the number of workers absorbed or improvements in the work force. Expanding and strengthening certified non-formal training programs that are linked to industry or regional development can serve to upgrade around 50 percent of Indonesia's workforce who have low educational attainment. In addition, Technical and Vocational High Schools (TVS) should be the reinvigorated and better linked to the changing demands of the labor market.

- Providing higher education students with a broad-based foundation and generic skills that are adaptive to the changing job market, while at the same time providing relevant and targeted skills needed for local development. Differentiatedmissions of higher education institutions can supply a variety of expertise including particular graduates for traditional manufacturing and service sectors. The promotion of a life-course that includes financial planning and education for young workers will also be beneficial.

- Ensuring higher education institutions provide graduates and research that increases added value and productivity of the agriculture sector toward achieving food security.

- Encouraging Indonesia's higher education system to promotethe sustainable use of natural resources through renewable resources that do not pollute the soil, water and air.

- Developing intellectual capital using Science, Technology, Engineering and Math (STEM) in combination with liberal arts and local wisdom. Efforts must be made to increase the number of higher education graduates in the hard sciences, such as engineering and agriculture. Expansion in the number of PhD graduatesis necessary to drive the next two decades of R&D and innovation. To increase the relevance of R&D, cooperation with the private sector should be enhanced.

III. Promotion of Inclusive and Productivity-led Sustainable Development

- Creating strong momentum to climb the development ladder through thecreation of a critical mass of skilled workers. Indonesia can serve as the home base for multinational industries that rely on a supply of raw materials and a skillful work force, such as marine based food-industries, garment and textile, consumer goods, and the automotive industry.
- Mainstreaming knowledge management (KM) inthe private and public sectors to stimulate creativity, spur innovation and create new knowledge to accelerate total productivity growth.
- Establishing higher education institutions to spearhead efforts in mainstreaming knowledge management through the three universities' obligations, or Tri Dharma University, that include teaching, research and community engagement. Higher education curriculum should incorporate sustainable development principles. Cooperation with the private sector can promote specific strategic knowledge creations including merger and acquisition (M&A), internal research and development and alliances to accelerate relevant innovations.
- Extending older peoples contribution to society by formalizing options for employment of older people with high specializations, vast tacit knowledge and unique skills. Active aging can be supported by raising the retirement age and providing employment opportunities for older persons.
- Investing in research and development (R&D) focused on a sustainable green economy and high added-value creationsfrom marine resources.
- Reallocating workers and capital from low to high productivity sectors by identifying high productivity activities and diffusing these activitiesthroughout Indonesia's economy. Industrial policies must be created to provide an integrated, comprehensive and systematized economy. Promoting productivity within sectorsby combining effective and efficient uses of capital, high quality workers and optimal production methodsthat use new and appropriate knowledge.
- Increasing quantity and quality of infrastructure investments to improve flows of goods and people across Indonesia. Infrastructure investments will lead to a decline in regional price disparities and logistics costs. Maintaining sound macro-prudential economic policies (i.e. fiscal and monetary policies) and other policies to support a friendly sustainable development investment climate.
- Implementing a reward and punishment mechanism at the sub-national level that encourages local governments to promote productivity-led, inclusive and sustainable growth in their regions. Building local government

capacity building is necessary to ensure this growth model is prioritized and will require assistance from the central government.

- Encouraging the most advantaged groups to contribute more to Indonesia's development by paying taxes according to their total incomes (i.e., labor and capital incomes) in order to raise Indonesia's low tax ratio of 12 percent.
- Protecting the poor and vulnerable groups from shocks (economic, political and natural disasters) by strengthening and expanding existing social protection programs.
- Continuing to expand access to basic minimum services across the regions. Improving access to primary health care facilities, primary education, basic sanitation, safe drinking water, nutritious affordable food, and shelter will enhance quality of life and eradicate poverty.
- Managing resources sustainability by maintaining a development threshold at nature's biocapacity. This can also be done by substituting non-renewables with renewable resources and recycling waste into input for production.

This study presents how population dynamics pose challenges as well as opportunities for sustainable development. The Indonesian people are at the center of sustainable development. Therefore, it is in the interest of policymakers, private sector, and civil society to work together to secure the future Indonesia wants by optimizing population changes.

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