



CENTER FOR HOMELAND
DEFENSE AND SECURITY
NAVAL POSTGRADUATE SCHOOL



HSx: ASYMMETRIC POPULATION GROWTH



June 2017

CONTEXT: BROAD STROKES

- The global population has grown at a nearly exponential rate since the start of the nineteenth century, but the growth is slowing and the world is ageing at an unprecedented rate. The population growth varies widely throughout the world:
 - Populations of many developed countries in Europe and East Asia are decreasing and are expected to continue shrinking over the next century.
 - Populations of North and South America are expected to remain relatively stationary or slightly decrease.
 - Moderate growth of populations in South and West Asia and North Africa
 - Exploding populations in sub-Saharan Africa.
- The percentage of the global population that is working age peaked in 2012 and is now declining and will continue to decline.
- The global population is expected to hit 9.3 billion by 2050 and 11 billion by 2100.
- The percentage of Muslims in the world is expected to rapidly increase, the percentage of Christians and Hindus is expected to remain constant, and the percentage of the world adhering to other religions is expected to decline by 2050.
 - By 2070, the number of Muslims may equal the number of Christians globally.

CONTEXT: WHAT IT MEANS

- Growing populations place strains on existing infrastructure and the environment in the growing countries, but present economic opportunities as the working age population (youth bulge) continues to grow if sufficient employment opportunities exist.
- Shrinking populations place economic strains on the decreasing working population through increased financial burdens as the ratio of elderly requiring support increases and the tax base decreases.
- Countries with changing demographic trends have economic advantages based upon the demographic changes occurring, which can bolster sustainable economic growth, a concept called the **demographic dividend**.
 - Countries are broadly classified as pre-dividend, early dividend, late dividend, or post-dividend based on population growth trends.
- Changing population demographics have strong ties to climate change and urbanization.

BACKGROUND: FERTILITY RATE AND REPLACEMENT LEVEL FERTILITY

- **Replacement level fertility** is a term that refers to the average birth rate per woman necessary for a country to maintain a stationary population excluding migratory affects.
- The replacement level fertility varies significantly based on mortality rates, with higher replacement level fertility necessary in countries with higher mortality rates.
 - The impact of infant and child mortality, especially girls, is particularly important as they represent deaths before individuals reach childbearing years.
- As of 2015, 75 countries have fertility rates below the replacement-level fertility of highly developed countries (2.1 births per woman).
 - By 2050, 120 countries are projected to have fertility rates below 2.1 births per woman.

BACKGROUND: REPLACEMENT LEVEL FERTILITY VARIATION

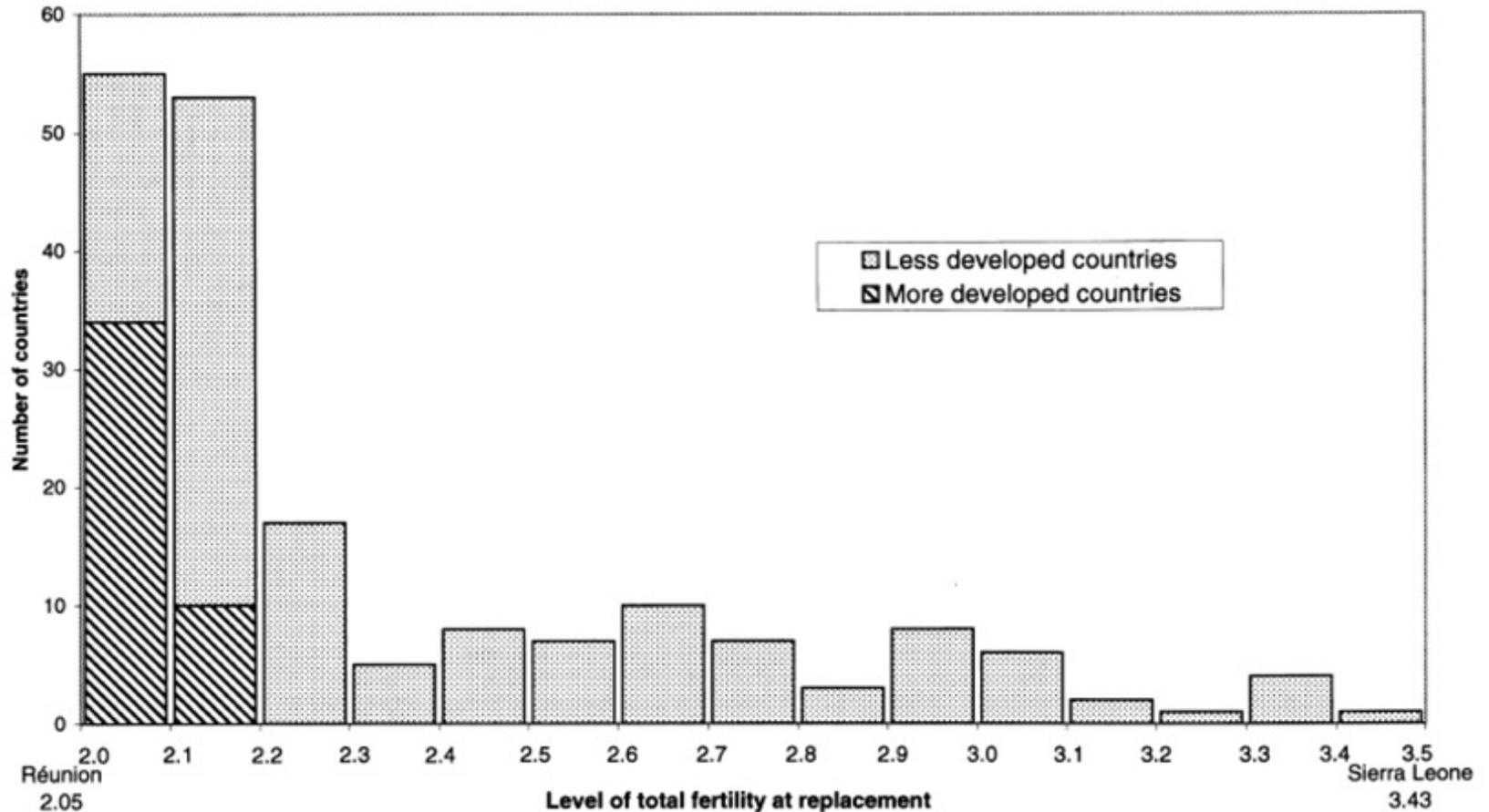


Figure 1. Distribution of replacement-level total fertility rates by country, 1995-2000 (N = 187). Source: Authors' calculations from data in United Nations (2001).

Image: Espenshade, Thomas J., Juan Carlos Guzman, and Charles F. Westoff. "The Surprising Global Variation in Replacement Fertility." *Population Research and Policy Review* 22, no. 5 (2003): 575-583.

BACKGROUND: DEPENDENCY RATIO

- The age distribution within a population is a key demographic component.
- Children and elderly population are dependent upon working age population as they have limited or no income and consume more than they produce (see image).
- The **dependency ratio** is the ratio of non-working age population to working age (generally considered ages 20 to 64) population. Related concepts are:
 - The **child dependency ratio**, which is the ratio of the child population to the working age population.
 - The **old-age dependency ratio**, which is the ratio of the population that is over 65 to the working age population.

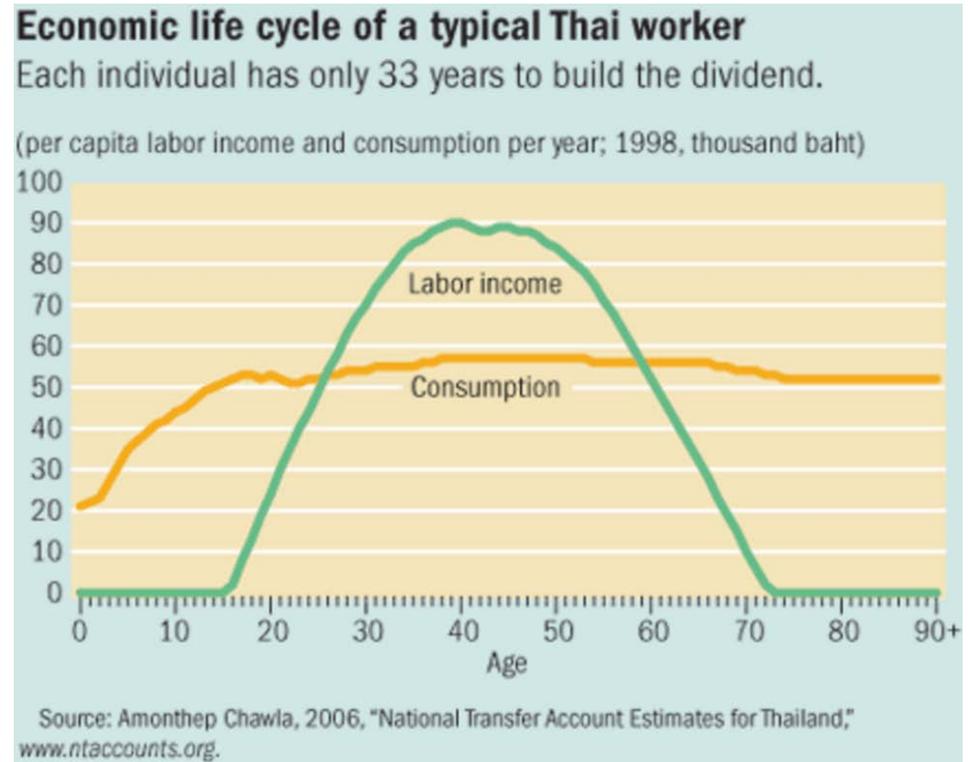


Image: Lee, Ronald and Mason, Andrew. "What Is the Demographic Dividend?" *Finance and Development* 43, no. 3 (2006).

BACKGROUND: REGIONAL OLD-AGE DEPENDENCY RATIOS

Old-age dependency ratio, 2015
and 2050 projection

$$\frac{65+}{20-64} * 100$$

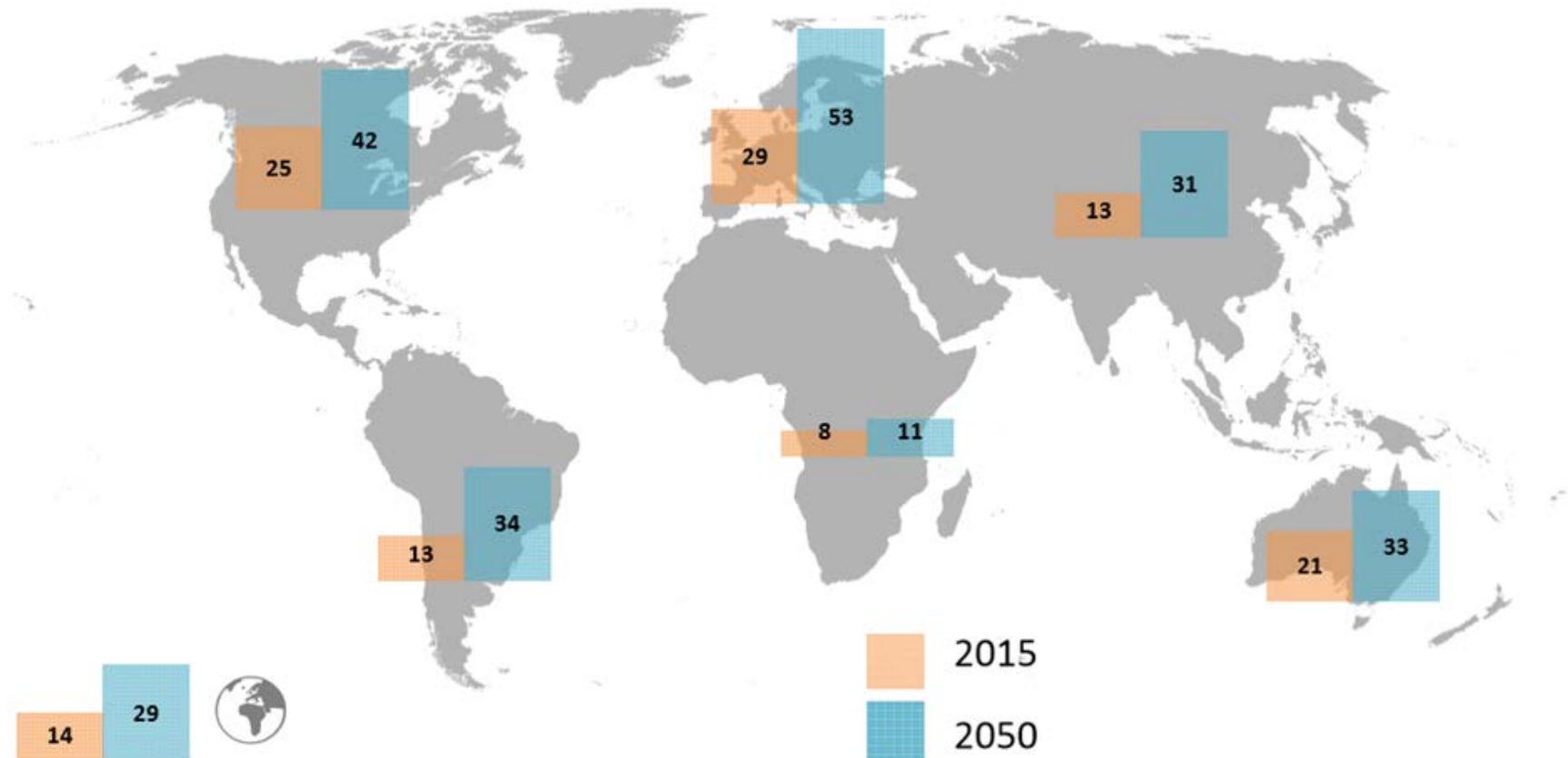


Image: Bassarsky, Lina. "Overview of Trends in Fertility, Population Ageing and Fertility Policies." 2015

BACKGROUND: DEMOGRAPHIC DIVIDEND

- As population growth trends change in countries, countries are presented with various opportunities for economic advantages based on the unique demography, and this opportunity is known as the demographic dividend.
- Countries with high fertility rates have very high child dependency ratios, and these countries are known as **pre-dividend** countries.
 - These are generally the least developed countries and the poorest countries throughout the world.
- As fertility rates begin decreasing in high fertility countries, a **youth bulge** is created, and after several years the dependency ratio and especially the child dependency ratio begins decreasing when the number of children decreases and the working age population increases as the youth bulge begins entering the workforce; these countries are labeled as **early dividend** countries.
- As fertility rates continue declining, falling potentially below the replacement fertility rate, and the population bulge starts approaching the high end of the working age band, the country continues ageing, meaning the average age and life expectancy continues increasing, the country is call a **late dividend** country.

BACKGROUND: DEMOGRAPHIC DIVIDEND CONT.

- As the population bulge begins ageing beyond the working age band and retiring, the number of retired individuals continues dramatically increasing and the working population decreasing. The old age dependency ratio continues to increase and eventually stabilizes; countries in this stage are called **post-dividend** countries.
- During the early and late dividend stages, the dependency ratio will be minimized, while during the pre-dividend and post-dividend stages the child and old-age dependency ratios will be maximized, respectively.
- The transitory first stage of the demographic dividend occurs in early dividend countries where large labor forces allow countries to increase labor intensive market segments, growing the average GDP as the dependency ratio declines and new jobs can be created and filled by growing workforce. The permanent second stage of the demographic dividend occurs in late dividend and post-dividend countries where population ageing leads to greater capital availability, allowing for capital intense investment opportunities to grow the economy.

BACKGROUND: DEMOGRAPHIC DIVIDEND COUNTRIES

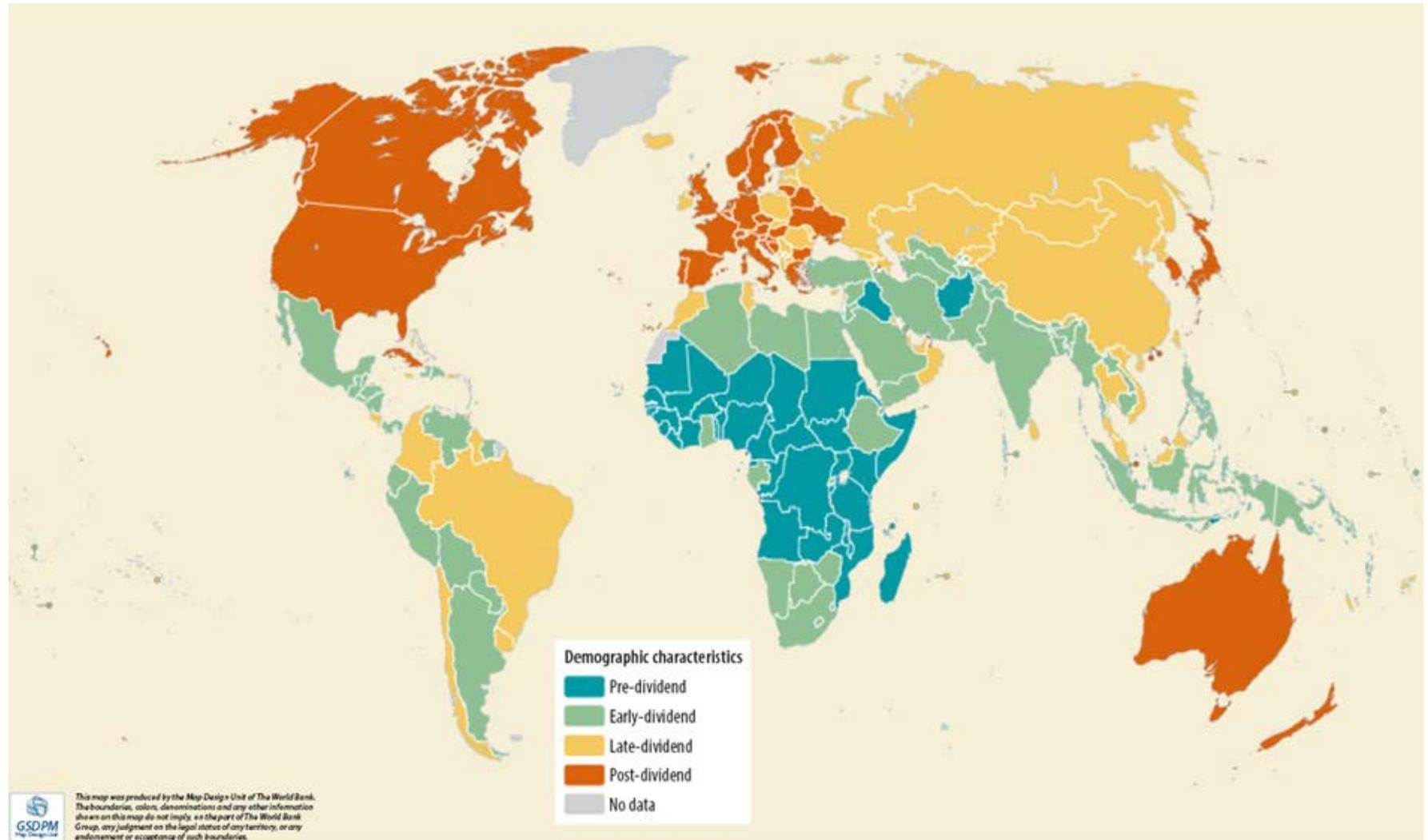
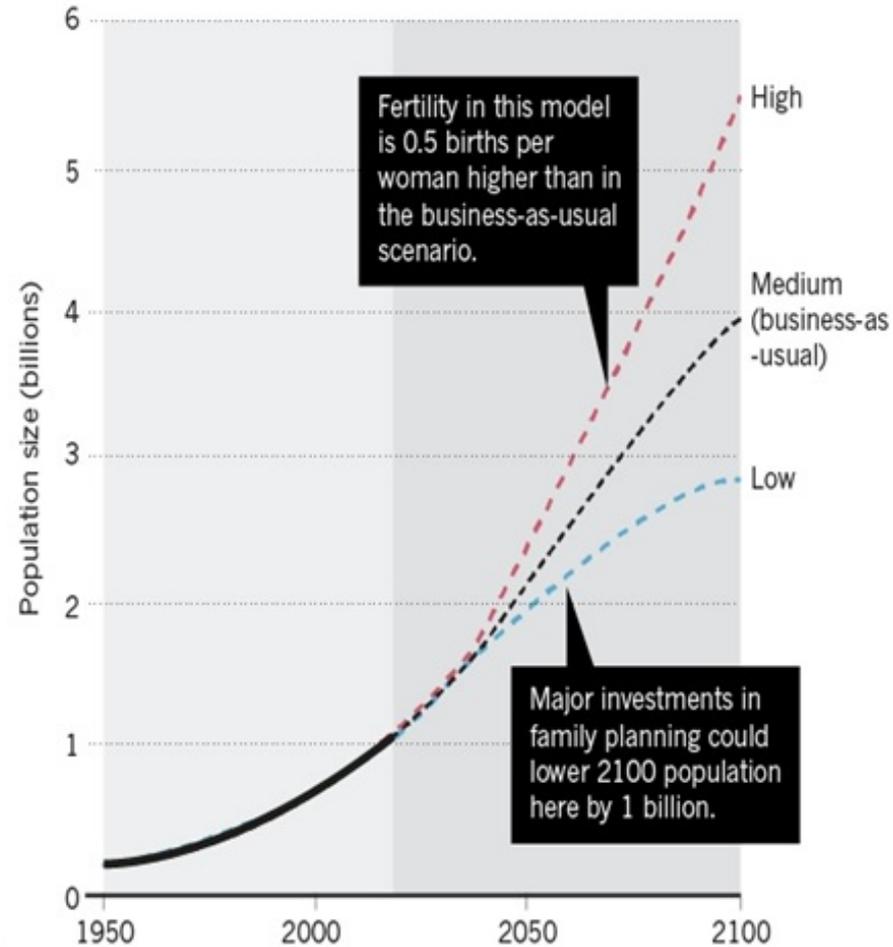
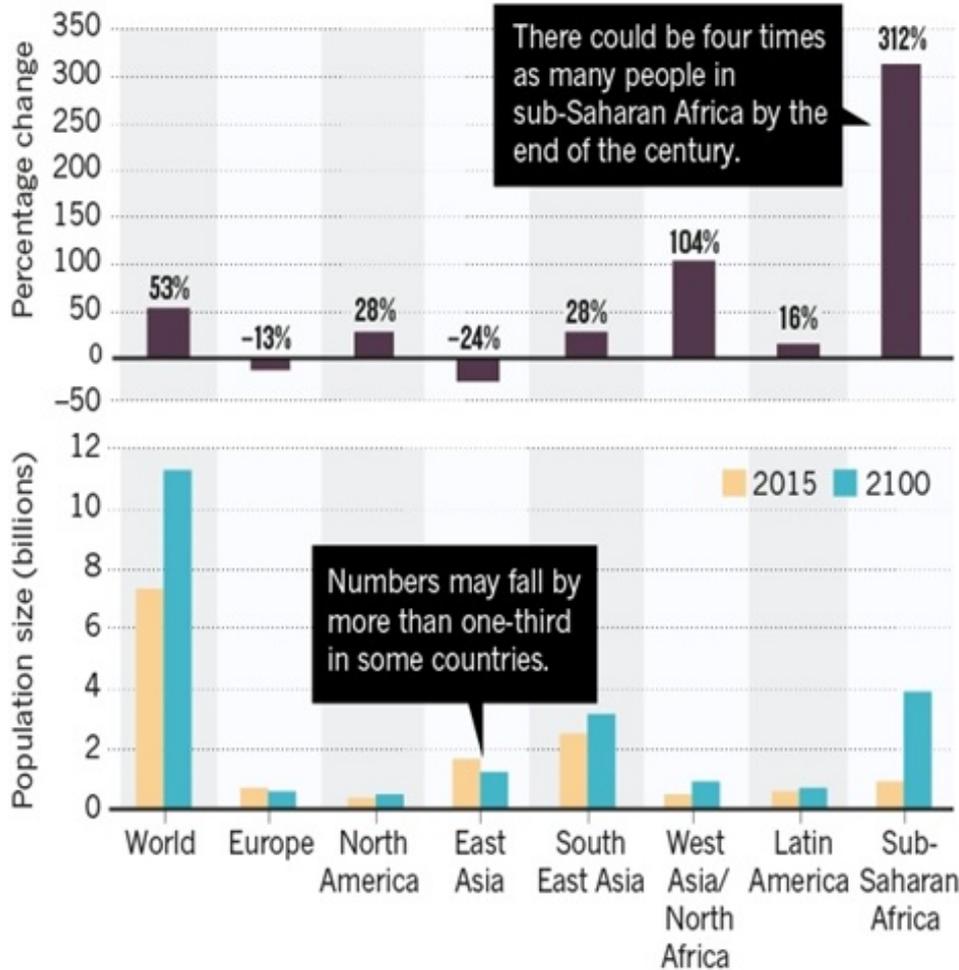


Image: Winthrop, R., G. Bulloch, P. Bhatt, and A. Wood. "Development Goals in an Era of Demographic Change." *Global Monitoring Report 2016* (2015).

EXPLODING POPULATION GROWTH: SUB-SAHARAN AFRICA



EXPLODING POPULATION GROWTH: SUB-SAHARAN AFRICA

- The population of sub-Saharan Africa is expected to increase from around one billion currently to nearly four billion by the end of the 21st century.
- By 2030, nearly 85 percent of the increased population living in urban environments around the world will be in Africa and Asia.
 - Without dramatically expanding infrastructure, a significant portion of this increased population living in urban environments will end up living in slums, highlighting the criticality of infrastructure investment and sustainable land development and zoning policies.
- This dramatic shift, combined with declining populations in many European countries, means that while there was three times as many Europeans as Africans in 1900 and twice as many Europeans as Africans in 1970, by 2030 there will be twice as many Africans as Europeans and by 2050 three times as many Africans as Europeans.

EXPLODING POPULATION GROWTH: SUB-SAHARAN AFRICA

- Eight of the ten world's youngest countries, based on median population age, are in Sub-Saharan Africa.
 - By 2050, all ten will be in Sub-Saharan Africa.
- Chad, Uganda, and Niger have median ages below 16 years old.
- A major contributing factor is the decline in infant and child mortality; infant mortality dropped from 1.83 percent to 0.69 percent between 1955 and 2015.
- Life expectancy has increased from 36 to 56 between 1955 and 2015.

Sub-Saharan Africa 2012

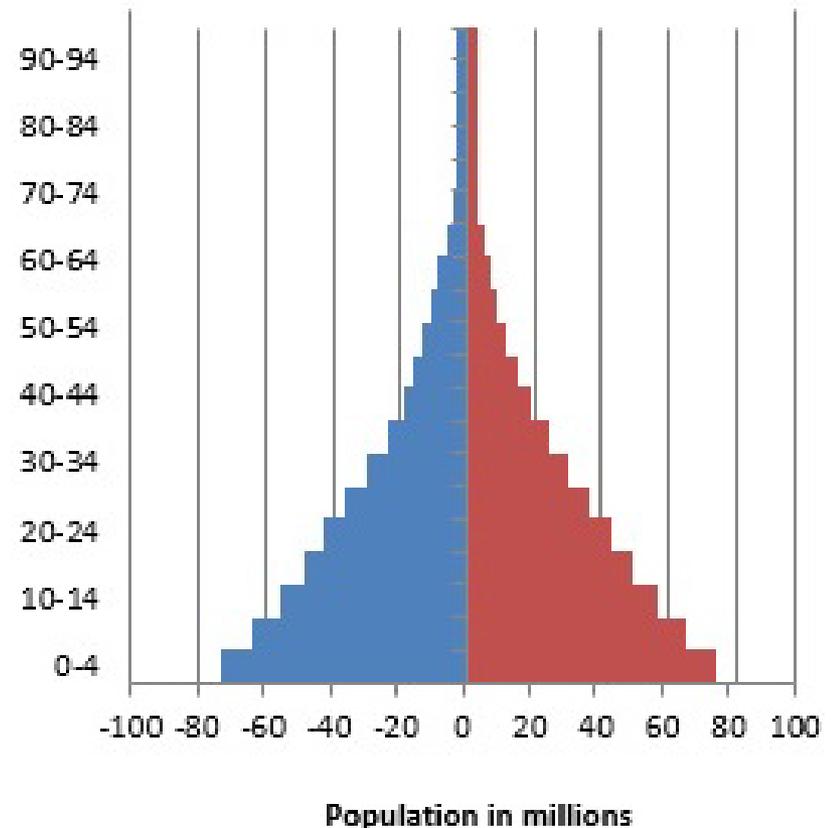


Image: Bakilana, Anne Margreth. "7 Facts About Population in Sub-Saharan Africa." October 29, 2015.

FOOD INSECURITY AND HIGH YOUTH UNEMPLOYMENT FACTORS IN ARAB SPRING

- During 2007 and the first half of 2008, global food (staple) prices, which had been steadily increasing since the late 1990s, began dramatically increasing.
- The ensuing food insecurity due to unaffordable high prices and a supply shortage led to riots, demonstrations, protests, and marches in several countries in the Middle East, Africa, Latin America, and Asia.
 - While the economic crisis of 2008 did temporarily reduce food prices, prices quickly rebounded and surpassed 2008 levels.
- Additionally, by 2010 young adult unemployment had reached 23% across the Middle East and North Africa, partially due to the 2008 economic crisis. Many of these unemployed young adults were highly educated.
- Food scarcity and rising food prices, in addition to high youth unemployment, are widely cited as likely catalysts for the Arab Spring movement.

DRAMATIC DEMOGRAPHIC CHANGES: IRAN

- Prior to the 1979, Iran had family planning systems in place, which were suspended in 1979 during political upheaval leading up to the Iranian Revolution.
 - While the official endorsement of family planning services was suspended, healthcare facilities continued providing family planning services.
- Government-sponsored family planning services resumed in 1989, bolstered by the endorsement of numerous religious leaders.
- Prior to the suspension of the family planning services in 1979, fertility rates had been increasing and continued increasing until the mid-1980s.
- Between 1985 and 2000, fertility rates plummeted from nearly 7.0 children per woman to about 2.0 children per woman.
- Contraception usage increased from 37 percent in 1976 to 72 percent by 2000.
- High costs of living and education, the high level of education (particularly for women), accessibility of healthcare services, economic stagnation, the Iranian Revolution and the Iran-Iraq War, and religious support of family planning and contraceptives are all believed to have contributed to the dramatic changes in fertility rates observed from 1970-2000.

DRAMATIC DEMOGRAPHIC CHANGES: IRAN

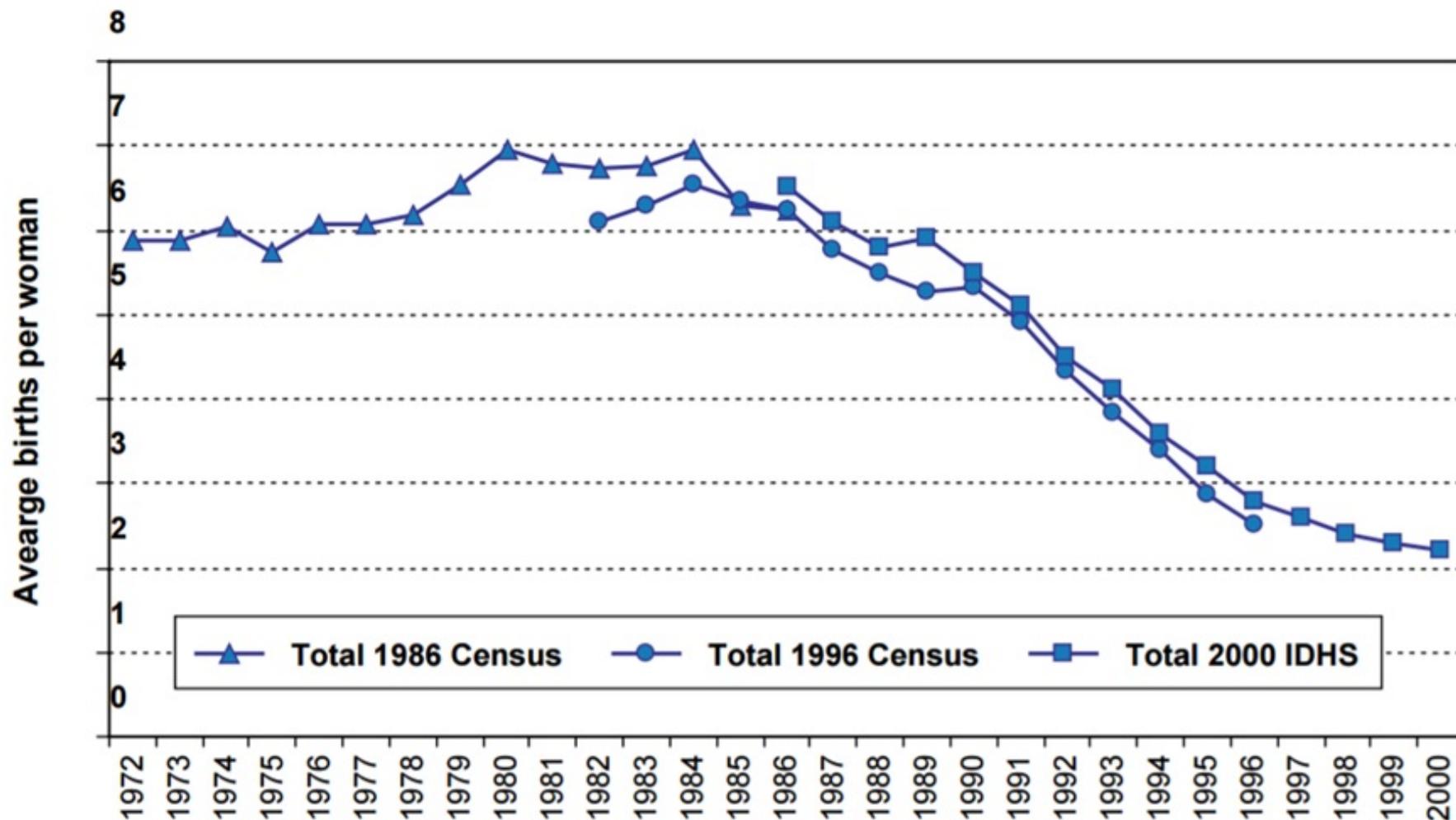


Image: Jalal Abbasi-Shavazi, Mohammad, and Peter McDonald. "Fertility decline in the Islamic Republic of Iran: 1972-2000." *Asian Population Studies* 2, no. 3 (2006): 217-237.

IMPLICATIONS OF ASYMMETRIC POPULATION GROWTH: POLITICS

- Countries with growing populations require expansion of existing infrastructure systems which is often difficult as the increased tax revenue from the growing labor force lags behind the necessary infrastructure investments.
- Countries with declining populations face challenges maintaining existing infrastructure systems as tax revenues decline as the labor force shrinks.
- Failure of governments to create policies that enable job creations to address population surges, resulting in high unemployment rates particularly in young adults and women, can lead to increased crime and political unrest and instability.

IMPLICATIONS OF ASYMMETRIC POPULATION GROWTH: ECONOMY

- The demographic dividend represents an economic advantage that can be leveraged to grow the economy in early, late, and post-dividend countries.
 - A key component of the magnitude of the demographic dividend is the average consumption vs. production of the population at each age within a country. There is a period during the working age that people produce more than they consume, growing the economy. The intersections of the consumption and production curves varies by country.
- Political and socio-economic instability and demographic uncertainties in pre-dividend and early dividend countries may represent too significant of risks to attract capital investments from late and post-dividend countries. For pre-dividend and early dividend countries, volatility of capital investments may pose a significant impedance on sustained growth.
- Population surges can increase unemployment if strategic policies encouraging economic growth and job creation are not passed, leading to economic stagnation.
- Rapid population growth can result in food and energy price volatility.

IMPLICATIONS OF ASYMMETRIC POPULATION GROWTH: ECONOMY CONT.

- **Dutch disease** can occur as foreign and domestic organizations begin investing in certain sectors within a country.
 - The resulting expansion and strengthening of those sectors strengthens the country's currency, making exports in other sectors relatively more expensive, reducing the quantity of exports.
 - Likewise, the strengthening of the currency makes imports relatively cheaper, reducing domestic consumption.
- The poor are generally disproportionately impacted by shocks from climate change, political unrest, or economic instability as they have less access to resources and capital to alleviate these stresses and are more reliant upon agriculture.
- International trade, investments, and immigration between countries at various stages of the demographic dividend can be mutually beneficial to all countries involved.
- In late and post-dividend countries, financial instability, high unemployment, limited parental leave, and lack of well paying part time jobs can lead young adults to delay having children and having fewer children.

IMPLICATIONS OF ASYMMETRIC POPULATION GROWTH: SOCIETY

- Culture values play a significant role in fertility rates, including cultural views on:
 - Pregnancy outside of marriage
 - Cohabitation (non-married adults living together)
 - Reproductive rights, contraception, and family planning
 - Child marriage and forced marriages
 - Women's rights, women's education, and women employment
 - Gender Equality
 - Childcare and domestic responsibilities
- The percentage of the world that is Muslim will rapidly increase, potentially equal to Christians by 2070. This could lead to significant demographic changes in several countries.
 - By 2050, there will be more Muslim than Jewish individuals in the United States
 - While seven of the G8 nations have a Christian majority, by 2050 four of the five largest economies will have a non-Christian majority.

Estimated change in population size, 2010-2050

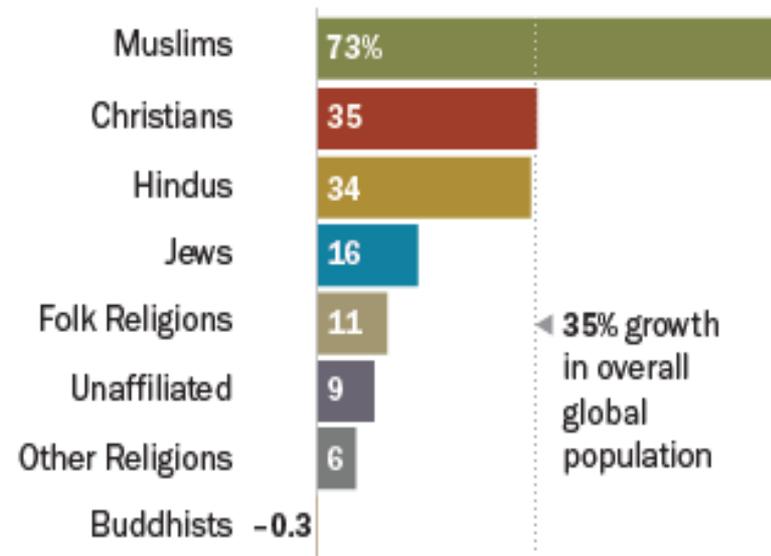


Image: Pew Research Center. "The Future of World Religions: Population Growth Projections, 2010-2050." April 2, 2015.

IMPLICATIONS OF ASYMMETRIC POPULATION GROWTH: SOCIETY CONT.

- Higher fertility rates are expected in late and post-dividend countries where it is easier for youth to enter into adult roles, such as ease of obtaining housing, ease of obtaining employment, and ease of obtaining advanced education (in countries where this is essential to gainful employment).
- Likewise, higher fertility rates are expected in late and post-dividend countries that alleviate the friction between child-bearing responsibilities and career responsibilities, such as sufficient parental leave policies, access to and affordability of childcare services, availability of part time employment, and ease of taking leaves of absence from advanced education.
- Reproductive health, reproductive education, and reproductive rights are critical to reducing high fertility rates in pre-dividend countries and moving toward the demographic dividend.
- **Brain Drain** occurs when highly skilled and highly educated individuals emigrate out of the country for economic, social or political reasons, leaving a void in the labor force.
 - This is particularly impactful when education and medical professional emigrate, decreasing the health and education of future generations.

IMPLICATIONS OF ASYMMETRIC POPULATION GROWTH: TECHNOLOGY

- Technology enables increased international trade and investments.
- Technological innovations can increase the agriculture yield, bolstering food security in countries with rapidly growing populations by reducing food scarcity and food price inflation.
- Energy efficiency technology and other technology that increase resource utilization efficiency can help reduce the environmental damage often associated with economic growth in developing pre-dividend and early dividend countries.
- Currently annual resource consumption takes roughly 1.5 years to restore; technological innovation can help reduce this overconsumption.
- Technology can also enable improved education and healthcare systems in order to reduce child and maternal mortality and increase human capital.

IMPLICATIONS OF ASYMMETRIC POPULATION GROWTH: ENVIRONMENTAL

- The environmental impact of population growth varies by developmental level of countries.
 - Less developed pre- and early dividend countries tend to suffer disproportionately high environmental damage due to primary labor intensive market sectors that generally involve depletion of resources (mining, fishing, harvesting lumber, agriculture, etc.).
 - Developing countries tend to have greater environmental damage from industrial activities as they have greater number factories but have not heavily invested in improving energy efficiency of these plants to reduce their environmental impact.
 - Developed late and post-dividend countries have lower environmental damage from industrial activities as these countries have improved energy efficiency, often due to regulation.
- Environmental damage can be especially significant in pre- and early dividend countries undergoing rapid urbanization where large urban slums can develop, leading to large pollution, contamination of water supplies, and destruction of land.
 - This can dramatically increase food and potable water scarcity.

IMPLICATIONS OF ASYMMETRIC POPULATION GROWTH: ENVIRONMENTAL CONT.

- While less developed and developing countries tend to suffer greater resource depletion and industrial pollution than developed late and post-dividend countries, much of the resources harvested and industrial products produced are exported to developed late and post-dividend countries.
 - This means that on a per person basis, late and post-dividend countries tend to drive the greatest environmental impact, however a significant portion of this environmental damage may occur in other countries.
- The environmental impact of population growth is not confined to the country in which the damage occurs and drives climate change, and therefore environmental protection must be a global concern.
- Consumption reduction, resource management, and environmental protection policies, in addition to energy and other resource efficiency improvements, are important to reducing environmental impact of population growth.
- Methods of decoupling economic growth from environmental degradation are critical to limiting economic damage in developing countries; thus far only about 25 percent of countries in the world have grown their economy without damaging their environment, nearly all of which are in developed countries.

THE PATH FORWARD

- Policies providing economic incentives for increasing fertility rates have been proposed and utilized in numerous late and post-dividend countries to varying levels of success.
- In pre- and early dividend countries, high fertility rates can be reduced through policies that:
 - Increase primary, secondary and tertiary education, especially for girls;
 - Provide greater accessibility and increased quality of healthcare facilities, family planning services, and contraceptives; and
 - Improve sexual and reproductive health, education and rights.
- The “Post-2015 Consensus”, the 2016 *Global Monitoring Report*, the annual World Development Reports, and the UN report “Compendium of Recommendations on Population and Development: Commission on Population and Development, 1994-2014” all outline numerous strategies for addressing challenges posed by population changes today and projected future population trends and associated challenges.
- The Growth Identification and Facilitation Framework is a methodology for identifying and leveraging country’s comparative economic advantage based on population trends in the country.

THE PATH FORWARD: GOVERNMENT ACTION

- Governments in pre-dividend countries should create policies addressing human development (investing in human capital), encouraging a decline in fertility rates, and ensuring environmentally sustainable development.
 - Effective pre-dividend policies include increasing quality and access to maternal and child health services, increasing education, especially for girls, and empowering women in domestic, economic, professional, and social environments.
- Governments in early dividend countries should create policies to encourage the private sector to accelerate job creation, increase human capital through increasing educational systems, invest in expansion of infrastructure systems, and begin aligning policies encouraging high capital economic growth that will become critical during the second phase of the demographic dividend in the late and post-dividend stages.
 - Effective early dividend policies need to focus on creating sufficient employment opportunities for the increasing workforce and investing in human capital to ensure sufficiently skilled labor for increasing job opportunities. These policies will ensure gainful employment and competitive wages for population in early dividend countries in order to reap the benefits of the first stage of the demographic dividend by growing the economy.

THE PATH FORWARD: GOVERNMENT ACTION CONT.

- Governments in late dividend countries should create policies encouraging private sector transition into high capital sectors, addressing the ageing society and the social and medical systems supporting the elderly, encouraging immigration to increase the working age population, and enabling citizens to make foreign investments to leverage the high capital of the ageing population.
 - In late dividend countries, policies should focus on methods to encourage increasing capital investments in order to transition from the first stage of the demographic dividend to the second stage.
- Governments in post-dividend countries should continue creating policies addressing the same issues as late dividend countries as well as encouraging increases in fertility rates towards replacement level.
- Governments in pre- and early dividend countries need to create policies in an attempt to prevent and limit the impact of **Brain Drain**, particularly policies aimed at maintaining educator and medical professionals.
- Governments in pre- and early dividend countries need to develop economic policies that aim to prevent **Dutch Disease**.

RESOURCES

- The following resources provide further information on this topic:
 - World Bank’s annual World Development Reports
 - Winthrop, R., G. Bulloch, P. Bhatt, and A. Wood. “Development Goals in an Era of Demographic Change.” *Global Monitoring Report 2016* (2015).
 - Lin, Justin Yifu. “Growth Identification and Facilitation: The Role of the State in the Dynamics of Structural Change.” 2012.
 - Espenshade, Thomas J., Juan Carlos Guzman, and Charles F. Westoff. “The Surprising Global Variation in Replacement Fertility.” *Population Research and Policy Review* 22, no. 5 (2003): 575-583.
 - Asongu, Simplice A. “Fighting Consumer Price Inflation in Africa: What do Dynamics in Money, Credit, Efficiency and Size Tell Us?” *Journal of Financial Economic Policy* 5, no. 1 (2013): 39-60.
 - United Nations, Department of Economic and Social Affairs, Population Division. “Compendium of Recommendations on Population and Development: Commission on Population and Development, 1994-2014” (Volumes I and II). 2014.
 - Hunter, Lori M. “Population and Environment: A Complex Relationship.” (2001).

- Additional research materials and information sources regarding this topic can be found in the associated *Literary & Scholastic Resource List*.

Literary and Scholastic Resources –Asymmetric Population Growth

Date of information: 23 March 2017

Overview: While not exhaustive, the following resources provide a roadmap to understanding the relationship between population growth (or reduction) in countries, environmental impact of development, changing religious demographics, urbanization, demographic dividend, dependency ratio, and youth employment. These resources provide a baseline of understanding, but as the strategic environment continues to evolve, new data will become available and resource lists will require updates.

Module Resource Lists to Cross-Reference: Urbanization, Major Economies Confront Shrinking Workforce, Drought Constrains Economic Development, Managing Global Issues as Actors Multiply, Middle East Instability

Organizations:

- **United Nations Department of Economic and Social Affairs Population Division:** The United Nations (UN) Department of Economic and Social Affairs (DESA) Population Division studies global population trends at the individual country level, as well as drivers behind these trends, in order to inform development and migration policies and goals. <http://www.un.org/en/development/desa/population/index.shtml>, Web, 23 March 2017
- **International Monetary Fund:** The International Monetary Fund (IMF) aims to encourage expansion and balanced growth of international trade and monetary systems, as well as making resources available to expand development capacities of developing countries, and publishes numerous reports, articles, and studies on economic policies and growth. <http://www.imf.org/external/index.htm>, Web, 23 March 2017
- **Population Reference Bureau:** The Population Reference Bureau is an organization that seeks to inform people around the world on issues at the intersection of population, health and the environment, empowering individual and advancing international policies. <http://www.prb.org/>, Web, 23 March 2017
- **World Bank:** The World Bank Group aims to end global extreme poverty and promote shared prosperity such that economic growth benefits all individuals of all income levels. <http://www.worldbank.org/>, Web, 23 March 2017
- **Pew Research Center:** The Pew Research Center is a nonprofit, nonpartisan organization that seeks to inform the public of and support sound decision-making based on trends, issues, and attitudes in national and international politics, science, religion, economics, and demography. <http://www.pewresearch.org/>, Web, 23 March 2017
- **Center for Strategic and International Studies:** The Center for Strategic and International Studies (CSIS) is a nonprofit policy research institution that provides strategic reports on many domestic and international topics including international development, economics, and transnational challenges (e.g. energy, trade). CSIS provides research and analysis and develops policy initiatives that look to the future. www.csis.org, Web, 23 March 2017

- **National Intelligence Council:** The National Intelligence Council (NIC) supports the Director of National Intelligence in the role as head of the Intelligence Community (IC) and is the IC's center for long-term strategic analysis. The NIC publishes many reports, including a quadrennial trends publication that includes information on demographic shifts. <https://www.dni.gov/index.php/about/organization/national-intelligence-council-who-we-are>, Web, 23 March 2017
- **Brookings Institution:** The Brookings Institution is a nonprofit policy organization that conducts in-depth research on local, national, and global issues. Brookings focuses on independent analysis that provides ideas on how to solve problems facing society. www.brookings.edu, Web, 23 March 2017

Recent Publications and Journal Articles:

- **World Development Reports:** The World Bank publishes an annual World Development Report which each year focuses on a different particular component of development challenges or critical topics, including gender equality, poverty, climate change, economic risk, human capital, and job creation. <http://www.worldbank.org/en/publication/wdr/wdr-archive>, Web, 23 March 2017
- **Development Goals in an Era of Demographic Change:** This report published by the World Bank in collaboration with the IMF focuses on international population growth and the corresponding development issues.
 - *Citation:* Winthrop, R., G. Bulloch, P. Bhatt, and A. Wood. "Development Goals in an Era of Demographic Change." *Global Monitoring Report 2016 (2015)*. <http://www.worldbank.org/en/publication/global-monitoring-report>, Web, 23 March 2017
- **Growth Identification and Facilitation: The Role of the State in the Dynamics of Structural Change:** This article discusses the processes of identifying a country's comparative advantage in the global economy, outlining the Growth Identification and Facilitation Framework to guide policy decision.
 - *Citation:* Lin, Justin Yifu. "Growth Identification and Facilitation: The Role of the State in the Dynamics of Structural Change." 2012. http://elibrary.worldbank.org/doi/abs/10.1596/9780821389553_CH03, Web, 23 March 2017
- **The Surprising Global Variation in Replacement Fertility:** This journal article presents information and challenges broad assumptions regarding the replacement fertility level. The replacement fertility level is the average number of children per woman necessary for the population in an area to remain constant. The authors show that numerous factors influence the replacement fertility rate and that the tradition 2.1 children per woman replacement fertility may be appropriate for well developed nations, however the replacement fertility rate may be much greater (up to 3.5 children per woman) in less developed and developing nations.
 - *Citation:* Espenshade, Thomas J., Juan Carlos Guzman, and Charles F. Westoff. "The Surprising Global Variation in Replacement Fertility." *Population Research and Policy Review* 22, no. 5 (2003): 575-583. <https://link.springer.com/article/10.1023/B:POPU.0000020882.29684.8e>, Web, 23 March 2017
- **Fighting Consumer Price Inflation in Africa: What do Dynamics in Money, Credit, Efficiency and Size Tell Us?:** This journal article focuses on the impact of financial sector policies addressing various financial dynamics on consumer prices, particularly on food and other staples.
 - *Citation:* Asongu, Simplice A. "Fighting Consumer Price Inflation in Africa: What do Dynamics in Money, Credit, Efficiency and Size Tell Us??" *Journal of Financial Economic Policy* 5, no. 1 (2013): 39-60. <http://www.emeraldinsight.com/doi/abs/10.1108/17576381311317772>, Web, 23 March 2017

- Compendium of Recommendations on Population and Development: Commission on Population and Development, 1994-2014, Volume I: This report examines various UN Commission on Population and Development resolutions between 1994 and 2014 mapped to specific objectives in the Programme of Action adopted at the International Conference on Population and Development in Cairo in 1994.
 - *Citation*: United Nations, Department of Economic and Social Affairs, Population Division. “Compendium of Recommendations on Population and Development: Commission on Population and Development, 1994-2014, Volume I.” 2014.
<http://www.un.org/en/development/desa/population/publications/policy/CompendiumVol1.shtml>,
Web, 23 March 2017
- Compendium of Recommendations on Population and Development: Commission on Population and Development, 1994-2014, Volume II: This report examines the outcomes of regional conferences focusing on population and development held throughout 2013 with the goal of assessing progress made within the region in addressing the objectives in the Programme of Action and updating development goals for beyond 2015.
 - *Citation*: United Nations, Department of Economic and Social Affairs, Population Division. “Compendium of Recommendations on Population and Development: Commission on Population and Development, 1994-2014, Volume II.” 2014.
<http://www.un.org/en/development/desa/population/publications/policy/CompendiumVol2.shtml>,
Web, 23 March 2017
- Decoupling 2: Technologies, Opportunities and Policy Options: This report examines the potential pathways and opportunities to increased resource productivities and efficiencies.
 - *Citation*: von Weizsäcker, Ernst Ulrich, Jacqueline Aloisi de Larderel, Karlson Hargroves, Christian Hudson, Michael Harrison Smith, Maria Amelia Enriquez Rodrigues, Anna Bella Siriban Manalang et al. *Decoupling 2: Technologies, Opportunities and Policy Options*. United Nations Environment Programme, 2014. <http://ecologic.eu/11130>, Web, 23 March 2017
- Population and Environment: A Complex Relationship: This report examines the complex relationship between demographic factors, technology, culture, policies, and institutional infrastructure in influencing environmental change.
 - *Citation*: Hunter, Lori M. “Population and Environment: A Complex Relationship.” (2001).
http://www.rand.org/pubs/research_briefs/RB5045.html, Web, 23 March 2017
- Africa's Demographic Transition: Dividend or Disaster?: This book published by the World Bank examines the rapid population growth in Africa and the implications of this growth.
 - *Citation*: Canning, David, Sangeeta Raja, and Abdo S. Yazbeck, eds. *Africa's Demographic Transition: Dividend or Disaster?*. World Bank Publications, 2015.
<https://openknowledge.worldbank.org/bitstream/handle/10986/22036/9781464804892.pdf?sequence=3&isAllowed=y>, Web, 23 March 2017

Other Resources:

- Global Food Security Project: This CSIS project aims to examine the various factors influencing global food security, providing the necessary research, analysis, and policy recommendations to increase international food security. <https://www.csis.org/programs/global-food-security-project>, Web, 23 March 2017
- Post-2015 Consensus: The Copenhagen Consensus Center conducted and published the Post-2015 Consensus, a collection of estimated economic impacts of various international development goals and

objectives from 2015 and later in order to provide quantitative impact potential of development funding and maximize the impact of such funding. <http://www.copenhagenconsensus.com/post-2015-consensus>, Web, 23 March 2017

- Human Population: Environment: This article published by the Population Reference Bureau provides an overview of how population growth impacts the environment, focusing on food production, energy consumption, and water availability. <http://www.prb.org/Publications/Lesson-Plans/HumanPopulation/Environment.aspx>, Web, 23 March 2017
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