

The Future of Indonesia



Development
Forecast 2030

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Title page picture sources: (top) Association for Tropical Biology and Conservation (2010); (bottom left) Anti-corruption, law reform and human rights organizations gathering during the November 2009 Black Ribbon Rallies, Transparency International (2009); (bottom center) Three months after the 2004 tsunami, Indonesia was moving away from acute emergency status to focus on strengthening infrastructure to withstand future natural disasters, World Health Organization (2004); (bottom right) Heavy rains during the wet season threaten Indonesia's rice harvest, The President's Post (2010)

Abstract

Though Indonesia was recently welcomed into the G20 and has earned lower middle income status by the World Bank, it faces significant development challenges which need to be addressed for the country to sustainably thrive in the future. It is still economically fragile after the Asian financial crisis and has mixed progress toward achieving the Millennium Development Goals (MDG's). The recently decentralized government is faced with increased pressure to ensure fair resource distribution among districts and regions in an innovative, sustainable fashion that doesn't further strip the fragile environment of its resources for economic gain. This will be especially critical for 69% of the population who will be working age in the next few decades,¹ who will require education, health and security to support their quality of life and the country's economic growth. The Government of Indonesia adopted a Medium Term Development Plan (RPJMN) 2010-2014, 'Development for All',² which seeks to raise levels of economic growth, create jobs and accelerate achievement of the MDG's. Meeting these stated goals in the delicate moment of democracy consolidation and economic recovery will require a comprehensive package of aggressive (but reasonable) policy reforms.

This paper provides an account of Indonesia's recent history to unveil the factors shaping its development progress and highlights its environmental damage, deforestation specifically, as one of the major issues facing the country today. Other critical development challenges include urbanization and a growing population, dependence on primary commodity exports, inequalities in health and education, expensive and fragile infrastructure, and the need to create democratic governance mechanisms within a historically corrupt system. I have used an integrated computer simulation of global change, International Futures (IFs), to aid in the forecast of fuel subsidy reduction and reforestation initiatives through the year 2030. Though the IFs program has a high level of uncertainty in forecasting the outcome of policies, it can be used by policymakers to imagine alternative futures and the feasibility of making change. The results show that, if implemented properly, Indonesia can achieve its national goals while compensating for its historically destructive environmental practices. This will aid in further economic growth by promoting a favorable climate for foreign investment and support while ensuring sustainability for future generations of Indonesians.

1. Introduction

Indonesia's national motto of 'unity in diversity' is a central theme running through all of the country's development trends. The archipelago consists of 17,000 islands occupied by 242 million people, giving it the rank of the fourth most populous country in the world.³ Its global positioning has led to strong influences from China, the Middle East and Europe, causing significant religious and ethnic heterogeneity evidenced by its divisions into 300 distinct ethno linguistic groups.⁴ The diverse population is dispersed in a 'core-periphery' model whereby the majority of the population lives and continues to migrate to the urban cores. The country has significant natural resources, including timber, fish, petroleum, natural gas and a variety of minerals, and one of the most diverse terrestrial and marine ecosystems in the world.

In the face of its geographic fragmentation and demographic and biological diversity, Indonesia has succeeded in achieving relative economic stability since its independence from strong central control and a rigid hierarchical system of Dutch governance in 1945. Quickly following independence the first President Sukarno enacted laws establishing authority and government structure at a more local level to give greater discretion to regional authorities. However, starting in 1959 Sukarno led Indonesia into a more authoritarian period under his 'Guided Democracy', a Presidential Decree in which the state became

¹ International Futures, version 6.36 (2010)

² United Nations 5

³ United Nations. *United Nations Partnership for Development Framework 2011-2015 Indonesia* (2010. Print) 2

⁴ Hugo, Graeme, et al. *The Demographic Dimension in Indonesian Development* (Singapore: Oxford University Press, 1987. Print) 11

obsessed with national unity, promoting economic development through socialist policies and remaining outside of the world market. Conditions worsened during this period, hitting a low in 1965 with an attempted coup followed by social upheavals against the Communist Party.⁵ This gave birth to the ‘New Order’, a three decade period of highly centralized governance led by President Suharto, marked by rapid growth and reduction in inflation leading to increased foreign aid and investment. Suharto resigned in May 1998 as a response to increased social unrest following the Asian financial crisis, making way for the institution of a democratic political system.

The rapid decentralization process that followed Suharto’s downfall devolved authority to all 30 Indonesian provinces to manage their own administration, public welfare and public health sectors through unique models of government structure aligning with local custom.⁶ (See the ‘Big Bang Decentralization’ section for a more complete account of the decentralization history and framework.) In the face of this transition, the newly elected officials have dealt with various crises, including the aftermath of the Asian financial crisis, multiple natural disasters such as the 2004 earthquake and tsunami which killed 160,000 people and destroyed the homes of 680,000,⁷ the recent global economic crisis, from which the country is still recovering, and ethnic strife remaining from the oppressive regime of the past. Simultaneously, Indonesia is feeling increased external pressure to remedy the destruction on the natural environment caused by 30 years of export led growth. It is in this highly transitional context that we can explore Indonesia’s development trends in order to better understand the challenges it faces today.

2. The State of the State

2.1 Population Patterns in a Changing Political Climate

The patterns of demographic transition have drastically changed over Indonesia’s recent history under different political regimes. Fertility reached its peak in the 1950’s under Sukarno who regarded a large population as a source of national strength.⁸ His pronatalist policies caused a 2% population growth rate post independence.⁹ However, the political transition in the 1960’s brought a decline in the fertility rate mainly through the adoption and wide distribution of modern contraceptives. Suharto’s slogan, “Boy or girl, it makes no difference”¹⁰ advocated for the target family size of two or three children, which remains the standard today. The Indonesian family planning program is regarded as a model of success and has been effective in reducing the total fertility rate (TFR) from 5.6 in 1960 to 2.26 in 2005, setting it on the course to reaching replacement level in 2011 as long as it is kept a national priority.¹¹ Despite successful family planning efforts, the residual effects of the post WWII population boom Sukarno’s pronatalist policies initiated population momentum, causing a total population increase leading to the youthful age-sex structure we see today (see Figure 2.1 below). Despite the increasing economic growth rates, the economy is not equipped to absorb the 2 million new entrants to the job market each year, increasing the annual levels of unemployment to 10.4% in 2005.¹² Estimates show that the economy would need to grow at a rate of 7% annually to accommodate the labor market entrants, which is a 1% increase of its current growth pattern.

⁵ Dick, Howard, et al. *The Emergence of a National Economy: An Economic History of Indonesia 1800-2000* (Australia: Allen and Unwin, 2002. Print) 26

⁶ Rabasa, Angela and Peter Chalk. *Indonesia’s Transformation and the Stability of Southeast Asia* (Santa Monica: RAND, 2001. Print) 48

⁷ United Nations 2

⁸ He was quoted, “My solution is exploit more land – because if you exploit all the land in Indonesia you can feed 250 million, and I have only 103 million...In my country, the more (children) the better.” Dick, Howard, et al. 26

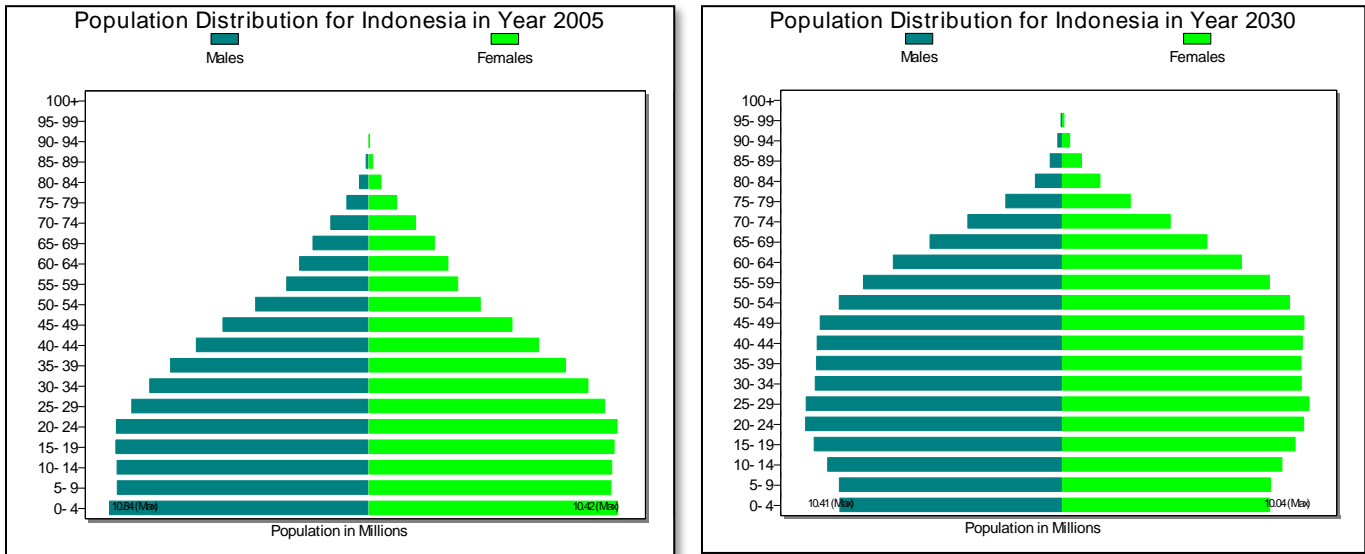
⁹ Hugo, Graeme et al. 193

¹⁰ Hugo, Graeme et al. 164

¹¹ International Futures, version 6.36 (2010)

¹² Asian Development Bank 3

Figure 2.1 Population Distributions in 2005 and 2030



Source: International Futures, version 6.36 (2010)

The majority of this population seeks employment in the urban centers, aligning with historical internal migration patterns and explaining the population growth rate differential in urban areas as compared to rural regions. In 1960, 14.6 percent of the population resided in urban areas, but by 2005 the urban population was up to 48 percent. For the first time in its history, the population in urban areas exceeds that of rural. If current trends continue, the IFs model shows that by 2030 nearly 60% of the population will live in urban centers. The country is faced with the challenge of accommodating dense populations in urban settings such as Jakarta, which has grown from 0.5 million people in the 1930's to 20 million in 1995, holding 10% of the national population.¹³

As a response, the Indonesian government has historically intervened in migration patterns to achieve a closer match between population densities and natural resources. Such an example is the transmigration program, the largest agricultural migration program of its kind in the world, which seeks to shift people from the densely populated core to outlying islands in the island chain.¹⁴ This program has devastating impacts on the environment that need to be reconciled, caused by increased deforestation as dwellings and infrastructure are installed to serve these migrant communities. The increased autonomy granted to outlying regional governments under decentralization has the potential to empower districts to engage in sustainable development practices and provide employment and incentives for people to stay in their villages rather than moving to the cities. This, however, is contingent on sufficient economic resources for these regions.

2.2 An Economy in Flux

It was due to the New Order's Program for Stabilization in Rehabilitation, enacted in 1966, that Indonesia experienced rapid economic growth for three decades and reaped the benefits of the 'Asian Miracle'. In this time, the largely agriculturally based economy shifted to industrial and GDP per capita grew by 4.7%. Attractive tax incentives lured in foreign investment and the oil boom of the 1970's allowed for high

¹³ Dick, Howard, et al. 33

¹⁴ Graeme, Hugo et al. 166

levels of domestic capital investments. By the end of the oil boom foreign investment captured 61% of GDP and the country enjoyed rapid export-led economic growth.¹⁵

In 1997-98 the Asian economic crisis and political turmoil weakened the economy, causing the GDP to contract by 13.7%, the rupiah to depreciate by 80% and inflation to rise to 50%.¹⁶ Despite the major setback, the economy was quickly on the recovery path post decentralization: GDP growth rose from 0.8% in 1999 to 5.6% in 2005¹⁷ and most recently achieved 6.2% growth rate in the second quarter of 2010.¹⁸ The strong economic growth post crisis was in part due to a sharp increase in exports, particularly in commodities such as palm oil, tin and rubber. In the five years preceding the 2008-2009 global financial crisis, the commodity boom led to a 120% export increase, which was even stronger than the growth through the 1990's¹⁹. Figure 2.2 (below) shows Indonesia's resource export dependence (in percent) exceeds that of other countries in the region and is forecasted to more than double that of its neighbors by 2030. A great reliance on commodities exports raises concern about the economy's increasing vulnerability to global market fluctuations and natural disasters which can destroy commodity production.

Figure 2.2 Interregional Resource Export Dependence (in Percent)

Year	Indonesia	Malaysia	Philippines	Thailand	Vietnam
2005	25.8	19.45	4.491	8.999	29.43
2030	18.68	7.629	2.526	5.601	7.968

Source: International Futures, version 6.36 (2010)

Concurrent to the increase in commodity exports was growth in manufactured goods, setting the stage for economic diversification away from primary products. Although much of manufacturing was initiated under policies of import substitution, manufacturing output grew more than 12% between 1965 and 1990.²⁰ This growth is primarily attributed to liquefied natural gas refining and Indonesia has prime opportunity in the alternative fuels sector with its vast stocks of geothermal power potential. However, there is a need to reinvigorate agricultural productivity and introduce technological innovations beyond a limited number of commodities. Continued investments in manufacturing and services will leave the country less vulnerable to external forces and decrease pressure on diminishing natural resources for economic growth.

2.3 Educating a Growing Population

The country's positive economic growth performance has been accompanied by an increased demand for educated workers as production continues to shift from agriculture towards manufacturing and the services sectors. In light of the increased number of people entering the workforce in the next few decades, education will be a key determinant in ensuring a highly skilled, productive population. Over the past few decades, Indonesia has made great strides to improve enrollment rates, from 80% at the primary level in the 1970's to 93% in 2002 and from 18% secondary enrollment to 80%.²¹ The gap between male and female enrollments has also diminished and the introduction of scholarships and school grants programs led to sustained enrollment levels through the economic crisis.

¹⁵ Dick, Howard, et al. 196

¹⁶ Dick, Howard, et al. 200

¹⁷ Asian Development Bank 1

¹⁸ World Bank. *Indonesia Economic Quarterly: Looking Forward* (September 2010. Print.) 1

¹⁹ International Monetary Fund. *Indonesia: Selected Issues* (Washington, D.C., September 2010. Print) 2

²⁰ K.S., Jomo and Michael Rock. *Economic Diversification and Primary Commodity Processing in the Second-Tier South-East Asian Newly Industrialized Economies* (Geneva: United Nations Conference on Trade and Development, June 1998. Print) 20

²¹ *Improving Education Quality* (The World Bank, January 2005. Print) 1

Decentralization Laws 22 and 25 transferred primary and junior secondary educational responsibility to district governments and upper secondary management to provincial governments, while the central government holds control of tertiary education. Education law 20 of 2003 transferred control of basic education from districts to schools – making a coherent national policy a large undertaking.²² Before decentralization, government was spending least amount on education of all countries in region (only 1.4%). Though this rose to 4% after 2002, this still falls far below other countries in the region and inequalities in regional tax revenue to support education only exacerbate the problem.²³ Significant disparities exist between the urban and rural populations, as large numbers of the rural poor, especially, are disenfranchised for lack of access to school, illiteracy and being forced to earn a living wage to support their families. An estimated 1.5 million children between the ages of 10-14 are at work, 10% are illiterate at age 15, and the participation in senior high school rate was only 51% in 2003.²⁴ Building capacity of regional governments to design curriculums, ensure equal access across socioeconomic lines and monitor educational quality will be key to ensuring Indonesia's human resources are skilled enough to compete in the domestic and global markets.

2.4 Inequalities in Health

Despite very limited health infrastructure, health campaigns launched from 1950-1970 aided in the eradication of malaria, yaws and smallpox and primary health care expanded through the 1980's through community health workers utilizing a cadre system to provide care.²⁵ As with education, Indonesia continued improving its health indicators into the new millennium, but decentralization has had a negative effect on health financing, information systems, human resources and service provision. The country has experienced an epidemiological transition towards noncommunicable diseases in recent years, though communicable disease remains a major cause of morbidity and mortality (tuberculosis alone infects 500,000 people annually).²⁶ Health data, however, is poor and has many gaps due to the voluntary submission of health data from local governments to the central ministry. In 2002 only 36% of health centers reported infectious disease surveillance to the central ministry, causing an inability to monitor and report on progress.²⁷

Box 2.1 Select Country Indicators

Population: 242,968,342

Total Fertility Rate: 2.28

Population Growth Rate: 1.097%

Life Expectancy: 71 years

Literacy: 90.4%

GDP: \$539.4 billion

GDP Growth Rate: 4.5%

GDP per capita: \$4,000

Unemployment Rate: 7.7%

Poverty Rate: 17.6%

Gini Index: 39.4

Source: CIA World Factbook (2010)

As part of the decentralization process, sub-regional governments have assumed the roles of service providers, creating serious interregional inequalities as natural and economic resources vary greatly across provinces and the mechanisms for horizontal transfers of funding and staff are not yet in place. Though there is one public health center for every 30,000 people, which is adequate to meet the needs of

²² The World Bank. *East Asia Decentralizes: Making Local Government Work* (Washington, D.C.: The World Bank, 2005. Print) 182

²³ The World Bank, 2005, 191

²⁴ European Union. *Indonesia-European Community Strategy Paper 2007-2013* (European Union, 2007. Print.) 10

²⁵ Graeme, Hugo et al. 110

²⁶ World Health Organization 7

²⁷ World Health Organization 11

the population, there are geographic variations in accessibility and hefty user fees deterring utilization. Human Development Indicators reveal significant internal health disparities: in terms of persons per hospital bed, the lowest ranking province is 7.6 times worse than the best ranking and there is a 13.3 year difference in life expectancy (57.8 compared to 71.1).²⁸ As could be expected, the richer segments of the population are benefiting more from public health expenditures through regressive subsidies for secondary care and funds being channeled towards richer districts.²⁹ The Ministry of Health has added responsibilities in line with decentralization to bolster and protect quality assurance systems and to coordinate with civil society groups to meet national health priorities.

2.5 ‘Big Bang’ Decentralization

During the ‘New Order’ period under Suharto, centralization became pervasive with the central government monopolizing all facets of economic and political management and using the military to exercise its control. This authoritarian structure fostered deep rooted social discontent, particularly in the peripheral island regions where calls for the restoration of Islam as a dominant sociopolitical force were not met, benefits derived from their abundant natural resources were not received and the regional governing institutions were managed entirely by the central government. Armed forces became permanent fixtures on these islands to defend national economic interests and prevent the emergence of opposition forces. As could be expected, violence was a common method to assert social control.

“We must maintain our identity, our Indonesianness... Our Indonesianness is reflected in our pluralism, or our unity in diversity, our decency, tolerance and moderation, openness and sense of humanity.”

-President Susilo Bambang Yudhoyono

Source: The Jakarta Post (2010)

The discontent in these regions was underlined by calls for power of self-rule and ignited separatist movements which often broke out into armed rebellion against the Suharto regime. This sentiment peaked in 1997-1998 when Indonesia was engulfed by the Asian economic crisis, which increased levels of unemployment, poverty and food prices, translating into increased crime and general socio-economic unrest. Fundamentally, the crisis revealed the failure of the highly corrupt central government to economically safeguard the country and precipitated a regime change to reverse state centered governance and redistribute power more justly between regions. As a response to nationwide demonstrations against his reappointment, President Suharto resigned in 1998. Following his resignation, the government underwent a rapid ‘Big Bang’ decentralization process under laws issued by

Suharto’s former Vice President Bacharuddin Jusuf Habibie and executed by subsequent governments. Law No. 22 on Regional Autonomy and Law No. 25 on Fiscal Equalization between Centers and Regions were enacted in 2001 to prevent the further disintegration of marginalized regions, providing them wide discretionary powers, substantial financial and personnel resources and granting special autonomy rules.³⁰

Indonesia is now a democratic republic with a competitive multiparty system and the subnational assembly is elected at local and provincial levels. The current President Susilo Bambang Yudhoyono was elected into office through the first national elections in 2004 and was reelected for a second term in 2009, restoring some legitimacy in the governance system. Though the ‘Big Bang’ process provided new opportunities for participatory democracy it occurred faster than any country in the East Asia region, leaving sub-regional governments ill equipped to administer economic and social duties and confused as to their level of authority due to lack of a policy framework and infrastructure expansion before

²⁸ The World Bank, 2005, 77

²⁹ Olken, Onishi and Wong 2

³⁰ The Asia Foundation. *Indonesia Rapid Decentralization Appraisal* (Washington, D.C.: The Asia Foundation, 2003. Print) 6

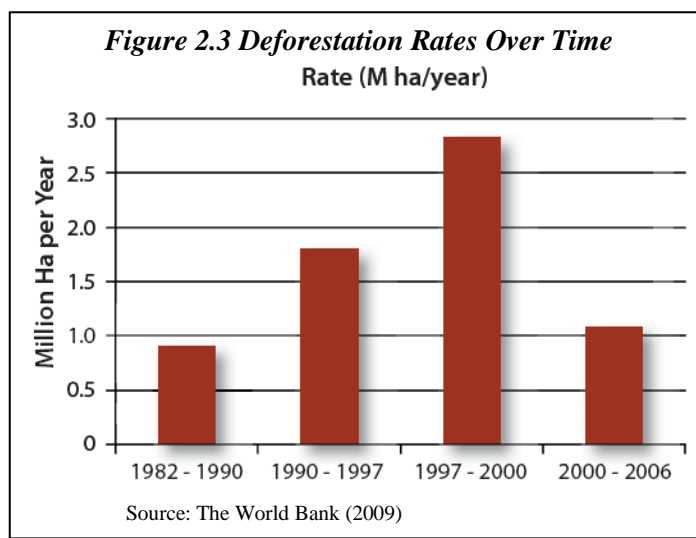
decentralization was enacted. Communal and religious conflicts continue to persist despite the President's promises of democracy and justice (shown in the above quote), as the democratic government continues to enforce laws inhibiting local autonomy and religious freedom. Curbing internal conflict as it reinforces democratic mechanisms for governance poses a huge challenge for Indonesia.

This transition has led to low levels of sub-regional governmental accountability and transparency, continuing the corruptive trends that have defined the state for the past fifty years. Corruption remains the current administration's top priority, yet despite the creation of anti-corruption institutions developed over the past few years, such as the Anti-Corruption Commission, Judicial Commission, Financial Crimes Task Force, Commercial Court, Ombudsman, Election Commission and Special Investigation Team for Corruption Crimes³¹, Indonesia scored a 2.8 in Transparency International's 2010 Corruption Perception Index, ranking 110 globally.³² The culture of patronage that has historically defined the state's political system challenges the fight against corruption in the face of the newly democratic government and poses an obstacle in implementing pro-poor policies.

2.6 Environmental Crises

As one of the most biologically rich countries in the world with abundant natural resources, the environment plays a pivotal role in Indonesia's development progress. Sixty percent of the population lives within 60km of the ocean, which encompasses 18% of the world's coral reefs.³³ The country is also home to the third largest area of tropical forest in the world with forestry accounting for 3-4% of GDP. The economic growth and poverty reduction experienced in the Suharto era was achieved without regard for the sustainable management of Indonesia's environment or the welfare of the local people whose livelihoods depended on it. Suharto, the most corrupt leader in the world according to Transparency International, regarded natural resources as a source of revenue to be exploited for political ends and personal gain.

In the past 50 years the proportion of degraded coral reefs has degraded from 10 to 50 percent and 40% of the forests have been cleared primarily for wood processing, strip mining and plantation crops such as palm and coconut oil.³⁴ Exacerbating this critical threat to the fragile environment, the mounting economic and social pressure post economic crisis in the late 1990's pushed the government to intensify natural resource extraction for short-term economic gains. Figure 2.3 compares average areas deforested during different periods, showing the drastic increase in deforestation from 1997-2000. Though the rate has declined in recent years, Indonesia



³¹ The World Bank. *Investing in Indonesia's Institutions*. The World Bank, July 22, 2008. Print.

³² Transparency International. *Corruption Perceptions Index 2010*. October 2010. Web. 27 October 2010. http://www.transparency.org/policy_research/surveys_indices/cpi/2010/results.

³³ The World Bank. *Investing in a More Sustainable Indonesia* (Washington, D.C.: The World Bank Group, October 2009. Print) 13

³⁴ Forest Watch Indonesia and Global Forest Watch. *The State of the Forest: Indonesia* (Indonesia: Forest Watch Indonesia and Washington, D.C.: Global Forest Watch, 2002. Print) xi

still experiences one of the highest rates of tropical forest loss worldwide. The carbon intensive economic growth continues today with increases in energy demands without concurrent increases in production or system capacity. High global oil prices are forcing the government to look inward for alternative energy solutions, yet fossil fuels have remained the solution. Yudhoyono plans to increase the use of coal by 40% over the next 20 years, particularly due to his 10,000 MW Electricity Fast Track Program which will expand the cheaper but more emissions intensive coal fired power plants.³⁵ The government's fuel and electricity subsidies, which peaked in 2000 at 28.6% of total government spending³⁶, only enhance over consumption and hamper development of alternative methods.

The costs of this are disproportionately felt by the poor whose livelihoods are directly tied to the quality and productivity of natural resources, are often located in high-risk disaster areas and cannot afford mitigation strategies to cope with degradation. High levels of vulnerability and diminishing resources have the real possibility of leading to internal conflict in these politically fragile, resource rich areas. The implementation of environmental rules and procedures has been slow in the post Suharto *Reformasi* era and the mechanisms for stakeholders to hold government agencies accountable is weak. The national government has not formalized standards for local performance in environmental management, with current economic policies favoring resource depletion and rewarding on resource revenue. Additionally, capacity at the district levels to support conservation practices is low (inadequate funding and enforcement), especially when this means sacrificing short term private economic gain. Exploitation of natural resources has reached a level, however, that the only way to protect local production and future incomes is through protection and innovative methods of diversifying the economy to take pressure off of the natural environment.

2.7 Guided Agriculture

In the 1980's and 1990's agricultural production was stimulated through government subsidization of inputs and land designated for agricultural use increased. Suharto aimed for Indonesia to be agriculturally self-sufficient to ensure food security and social development. The government achieved agricultural self-sufficiency of rice and sugar crops by utilizing Green Revolution tactics of heavy pesticide and fertilizer use on land taken from indigenous populations. Though this era of guided agriculture resulted in higher crop yields, it was at the costs of human rights atrocities, loss of cultural identity among farmers and environmental damage.

Further economic growth and industrialization in Indonesia has resulted in a reduction in the contribution of agriculture on GDP from 49% in 1970 to 13% in 2005.³⁷ However, the agricultural sector still employs the largest population and the poor, thus playing a primary role in poverty reduction. Strong income and population growth have resulted in an increase in food demand, yet the growth in domestic rice production, Indonesia's staple food, has slowed since the mid 1990's as the availability of arable land has significantly decreased and yields have contracted. As a result, there has been an increase in imports to meet increasing demand. With continued income and population growth, food demand in Indonesia is expected to increase accordingly.

The country is highly vulnerable to the effects of climate change due to its long coastlines, tropical climate and high population density in coastal areas. Global climate change will cause temperature increases, a 2-3% increase in annual rainfall, shorter rainy seasons, and a rise in sea levels, resulting in reduced soil fertility, land surface decline, damage to productive coastal zones, and increased threat of

³⁵ The World Bank, 2009, 64

³⁶ The World Bank, 2009, 32.

³⁷ Bond, Russell, Gil Rodriguez and Jammie Penm. *Agriculture in Indonesia: A Review of Consumption, Production, Imports and Import Regulations* (Australia: Australian Bureau of Agricultural and Resource Economics, August 2007. Print.) 2

forest fires. The severe impacts on agricultural productivity and infrastructure threaten food security and the millions of Indonesians whose livelihoods depend on the marine and agricultural production sectors. The GDP loss due to climate change is estimated to reach 2.5% by the end of 2010, over four times the global level. Efforts to mitigate the negative effects of climate change will be essential to future security.

2.8 Fragile Infrastructure

As manufacturing the leading income sector for Indonesia's economy today, there is a great need to boost infrastructure to make way for the expanding sector in the future and attract foreign investment. Public expenditures for the construction of roads and bridges has far surpassed other infrastructure investments, though 52% of villages still remain without access to paved roads and those that do are financially unable to maintain them. The rural areas also experience a deficit in the access to clean water and sanitation, with only 78% and 55% access, respectively. These point to one of the main infrastructural issues in the country of unequal distribution between the urban centers and the rural areas, with the most construction occurring on Jakarta.

The biggest obstacles to infrastructure development concern problems with acquiring land, lack of regional and central government coordination and a corrupt bureaucracy. Due to Indonesia's geographic positioning in the ring of fire, existing infrastructure is highly vulnerable to natural disasters and has cost the country billions of dollars to reconstruct in recent years. Maintenance issues lie at the center of infrastructure concerns due to natural occurrences and funding getting caught in bureaucratic machinery. The victims of this crisis are often those historically ignored populations living on peripheral islands. The people in Aceh, for example, are still struggling with infrastructure reconstruction after the 2004 tsunami and have experienced increased frustration and social unrest in the already unstable region.

3. Prospects for the Future

The most recent World Bank economic report on Indonesia shows that the country continues to recover from the global economic crisis, achieving growth above pre-crisis levels. Though the GDP per capita has been steadily increasing, the number of Indonesians who have enjoyed this economic success is questionable. Government investment in the public sector fell from 7% in 1996 to only 4% in 2000; health spending has fallen below 3% of GDP, education expenditures only amount to 6% of the budget and infrastructure only 2%.³⁸ Additionally, as the IFs model shows, Indonesia's Gini value in 2000 was .303 and by 2005 it rose to a record high level of .394. The IFs model forecasts that it will remain just below this level through 2030.

More than half of the population lives on less than \$2/day and remains vulnerable to internal and external shocks at all levels, including natural disasters, susceptibility to illness and government restructuring. Decentralization poses additional social and economic obstacles to poverty alleviation and more equal economic distribution as local governments scramble to expand service delivery to their populations. Social services could be further weakened unless significant efforts are made to alleviate corruption by local leaders who are vying for more power without accountability. Though government efforts have been made to fix some of the inefficiencies in decentralization legislation, such as reforms to Laws 22 and 25 enacted in 2004 to increase the role of higher government levels to facilitate more effective budgetary management and administration, only time will tell if the granting of local autonomy will create a healthy environment for democratic development or further fractionalize the country.

The government's history of legitimizing itself through economic growth without due regard for the environment will have drastic effects on the stock of key natural resources, a significant threat to health and human welfare caused by industrial and urban pollution and increased conflicts over the use of

³⁸ Asian Development Bank 3

resources. Future growth and development will depend on the existence of natural resources and the sustainability of critical ecosystems. The problems associated with rapid industrial sector growth concentrated in urban areas will ultimately lead to resistance of industrial expansion and have profound effects on the overall economy.

3.1. Medium Term Development Plan (RPJMN)

The government's Medium Term Development Plan 2010-2014 may prove to be an effective catalyst to enact the necessary environmental improvements and ensure the poor do not suffer through this process if policy reforms are appropriately implemented and monitored. President Yudhoyono and Vice President Boediono formulated the most recent Medium Term Development Plan (RPJMN) as part of a longer development initiative (RPJPN 2005-2025) to realize an Indonesia that is prosperous, democratic and just through focusing on improvement of 11 development priorities, a few of which are outlined below³⁹:

- *Average economic growth of 6.3-6.8% per annum; economic growth more than 7% before 2014*
- *Poverty rate of 8-10% by 2014*
- *Population growth of 1.1% by 2014*
- *Illiteracy rate of population aged less than 15 years reduced to 4.18% in 2014*
- *Life expectancy increase to 72 years in 2014*
- *Mortality rate per 1,000 births reduced to 24 by 2014*
- *HIV prevalence less than 0.5% by 2014*
- *Corruption perception Index 5.0 in 2014*

The government plans to achieve these stated goals through a combination of initiatives funded through the public sector (18%) and private sector (82%). The above chosen development and sectoral targets included in the RPJMN can be measured in the IFs program to determine the effectiveness of policy interventions in meeting national priorities.

3.2 Policy Recommendations

Any long-term environmental policy reform would need to set up a regulatory and economic framework which provides incentives to change behavior, accounts for environmental costs, enhances resource conservation and improves revenue collection mechanisms. One example of this is to reduce fuel subsidies while providing conditional and unconditional cash transfers to the poor - compensating for short term economic burden while increasing access to education and health. Simultaneously, a carefully implemented reforestation initiative which protects sufficient land for crop production would serve to protect biodiversity and offset increased carbon emissions. Good governance is critical during this process to manage the distribution of funding to poor households and create reforestation monitoring mechanisms to avoid illegal logging and mining activities.

3.2.1 Subsidy Removal and Cash Transfer Program

The removal of fuel subsidies is an important step in the direction of internalizing the costs of environmental destruction into production, re-pricing good to align with international benchmarks and making producers and consumers accountable for unsustainable practices. The increases in world fuel prices in 2005 inspired such a policy, whereby the government significantly decreased subsidies and increased fuel prices by 29% and again later that year by 114%. Though this created significant funding pools, up to \$10 billion in 2006, it further marginalized the poor who were unable to meet the increased fuel costs. The government implemented an Unconditional Cash Transfer (UCT) program in August 2005 to ensure the impoverished population would not suffer. There were inherent problems with the

³⁹ National Development Planning Agency. *The National Medium Term Development Plan (RPJMN) 2010-2014*. (Jakarta: Government of Indonesia, February 8, 2010. Print) 9

unconditional nature of this initiative, mainly that a large portion of the recipients were not classified as poor by government standards. The Conditional Cash Transfer Program (CCT), enacted in 2007, connected payments to education and health spending to eliminate some of the targeting problems of the UCT program. This pilot CCT program applied cash transfers to both households (individuals receive quarterly payments through the post office as long as they meet requirements of using specified health and education services) and communities (communities decide how to best use allocated block grants to achieve health and education targets).

Since 1998 the Indonesian government implemented the Kecamatan Development Program (KDP) and the Urban Poverty Project (UPP), large scale community development programs implementing participatory, community driven development. In August 2006 President Yudhoyono announced a dual-component poverty alleviation program consisting of the National Community Empowerment Program (PNPM-Mandiri), building upon the KDP and UPP which ended in 2005, and the CCT program, which together targeted all 70,000 villages in 5,300 rural and urban sub-districts in the country.⁴⁰ The cash transfer program, implemented in six provinces, is designed to achieve objectives and goals in line with the national development plan and the MDG's. More specifically, these programs target poverty reduction, maternal mortality reduction, child mortality reduction and ensure universal coverage of basic education.⁴¹ The CCT emphasizes certain lagging health and education outcomes through targeted community investments. It is an appropriate policy intervention for Indonesia for multiple reasons: it utilizes mechanisms developed through eight years of community driven development; allows communities to articulate service demands and propose local solutions; and utilizes a participatory approach to better target services to self-identified beneficiaries. Though the Conditional Cash Transfer program is in a pilot stage and is thus limited in scope, the likelihood of the program being implemented on a national scale is very high, suggesting many potential benefits not only for the impoverished but for the country as a whole.

3.2.2 Reforestation Initiative

A reforestation initiative would expand and protect biodiversity, improve human health, mitigate the alarmingly high level of the country's greenhouse gas emissions and provide indigenous populations an opportunity to reclaim their livelihoods. See Appendix 1 for the drivers and forward linkages of environmental change. The Suharto government created a national forest Reforestation Fund in 1989 to support reforestation and rehabilitation of degraded land. However, during this time the Ministry of Forestry used the fund to promote the development of industrial timber and pulpwood plantations and granted contracts to plantation companies with close ties to political elites. A subsequent audit of the Fund showed losses of \$5.2 billion in public funds during a five year period in the mid 1990's alone.⁴² Since then, the government has taken steps to restore legitimacy to the Fund, but the challenges of financial management and administration posed by decentralization remain.

The likelihood of adherence to a wide scale reforestation effort today is high, considering the government's interest in participating in a Reducing Emissions from Deforestation and Forest Degradation (REDD) program, a global effort which uses market incentives to reduce greenhouse emissions from deforestation. This type of international forest carbon market is expected to be established after 2012 and could provide tremendous financial opportunities for Indonesia. Estimates of potential gains to the country through REDD range from \$0.5-\$2 billion/year.⁴³ As of this year, the government has

⁴⁰ Olken, Onishi and Wong 7

⁴¹ Olken, Onishi and Wong. 1

⁴² Barr, Christopher, et al. *Financial Governance and Indonesia's Reforestation Fund during the Soeharto and Post-Soeharto Periods, 1989-2009*. (Indonesia: Center for International Forestry Research, 2010. Print) xi

⁴³ World Bank, 2009, 83

planned on a two-year moratorium on new forestry concession on rainforest lands and peat swamps and will be supported over the next five years by a \$1 billion contribution from Norway. Future external contributions and funding set aside from the domestic budget could finance the reforestation efforts in the future.

Along with these initiatives to protect environmental biodiversity through reforestation and promote environmental accountability through fuel subsidy removal, action must be taken to improve governance to curb destructive practices and ensure fair distribution of funding to the poor. Integrating these proposed policy reforms into the IFs model, we can forecast Indonesia's future development path through year 2030 to determine if these interventions will catalyze the achievement of the country's development goals and the broader MDG's.

4. The Intervention

In order to mimic a nationwide Conditional Cash Transfer program, I first increased the value of government transfers to unskilled households (govhhtrnwelm) to 1.2 starting in 2010 through 2030. Though this would transfer government funding to households, it does not subsequently tie the increased household income on education or health expenditures as the program requires. Rather, IFs automatically assumes the additional income will be spent on domestic consumption. To create a scenario more realistically tied to the CCT program, I increased the total transition rate of students into lower secondary education programs (edseclostrangr) to 1.0 and lowered infant mortality (hlmininfmort) to 1.0 through 2030. I manipulated the level of corruption as a fourth intervention point, aligning with the national anti-corruption efforts already in place. To do this, I increased the government corruption multiplier (govcorruptm) starting in 2010 by 250%, forcing Indonesia to reach 6.69 on Transparency International's Corruption Perception Index by 2030.

The main drivers for environmental change are population, land use, economic activities and governance. Within the environmental leverage points, IFs provides forest land use as the indicator most relevant to the reforestation initiative. In order to be fully accurate, the model would need to differentiate between the types of forests generated (to account for such differences such as a primal forest or timber plantation). However, I have assumed that the land area will not be reforested for future clearing. Although ecological activity and population are highly correlated, there would likely be no effect in lowering TFR on the amount of forest land given that the land is not automatically credited to nature. Neither economy nor governance result in direct changes for environmental indicators in the model, thus the one possible intervention that will effect change is the Forest Protection Multiplier, forestm, which causes the area dedicated to forest land use to change. Since forestm displaces other land use and thus would have grave implications on agricultural production and food security, I implemented a moderate increase to 1.1 starting in 2010 through the year 2030 and after that it returns to the neutral value of 1.0.

The scenario implemented as would have an inherent conflict between improving the natural environment and food security. To modify the intervention to increase the likelihood of its implementation, I increased the agricultural yields multiplier (ylm) by 1.2 through 2030, after which time it was decreased back to 1.0.

5. Analyzing the Results

Figure 5.1 (below) shows the effects of the cash transfer and corruption scenario on various development indicators. The values in red in the 2014 intervention column are those development goals outlined in the RPJPM that were not met in the alternative scenario and the values in black were achieved. As the chart shows, most of the development goals outlined in the RPJPM were met without the interventions, yet the alternative scenario shows measured improvements over the base case by 2014 in GDP per capita at PPP, GDP growth rate, poverty level, infant mortality and corruption perception. Corruption perception was the one national goal that was achieved through the intervention alone, yet by 2024 instead of the 2014 target date. By 2030, the forecast date for this paper, all measured development indicators show improvement in

the new scenario except for two: HIV prevalence, which remained stagnant, and population growth rate which increased by 0.002%. Both of these pose insignificant differences from the base case scenario and thus do not have negative consequences for the country.

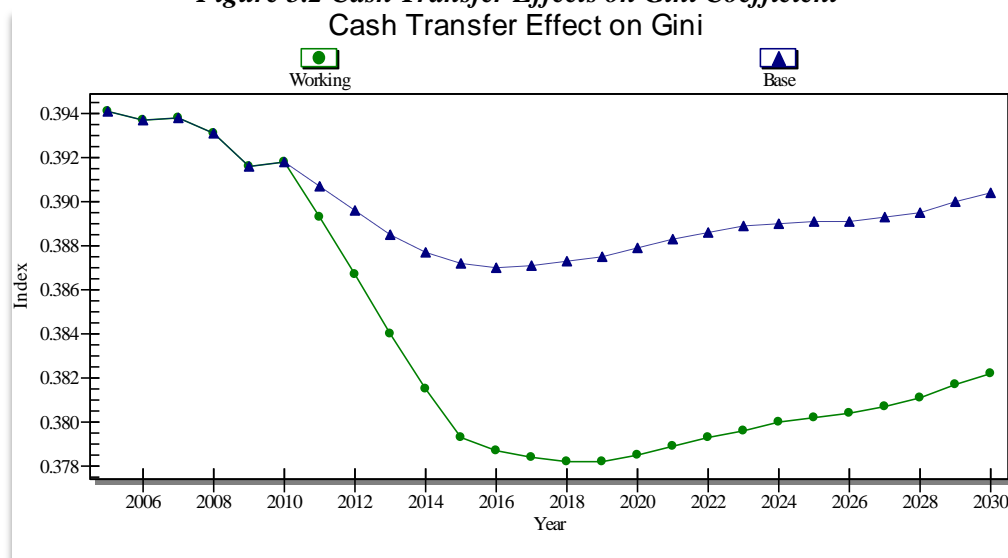
Figure 5.1 Effects of Scenario 1 on Select Development Indicators

Indicator	2010	2014		2030	
		Base Case	Scenario 1	Base Case	Scenario 1
GDP per capita PPP (Thousand \$)	3.201	3.459	3.463	4.891	5.094
GDP growth rate (Percent)	3.481	4.321	4.392	2.722	3.378
Population with < \$1/Day (Percent)	10.15	5.866	5.164	3.609	2.476
Population Growth Rate (Percent)	1.083	0.908	0.908	0.422	0.424
Literacy (Percent)	93.15	94.78	94.78	99.78	99.80
Life Expectancy (Years)	71.69	72.42	72.42	74.82	74.90
Infant Mortality (per 1,000 births)	24.61	22.11	22.08	14.79	14.42
HIV prevalence	0.09	0.087	0.087	0.064	0.064
Corruption Perception	2.275	2.33	3.03	2.633	6.69
HDI	0.763	0.776	0.777	0.826	0.829
Malnourished People (Percent)	2.834	2.659	2.622	1.829	1.519

Source: International Futures, version 6.36 (2010)

The cash transfer and corruption interventions also had a positive effect in reducing national inequality, and as Figure 5.2 shows below, reduced the Gini coefficient to as low as 0.378 in 2018 (as compared to 0.388 in the base case). Since the Gini value is a difficult one to change over time, it is significant that the scenario improved this number considering there was no intervention introduced to directly affect it.

Figure 5.2 Cash Transfer Effects on Gini Coefficient
Cash Transfer Effect on Gini



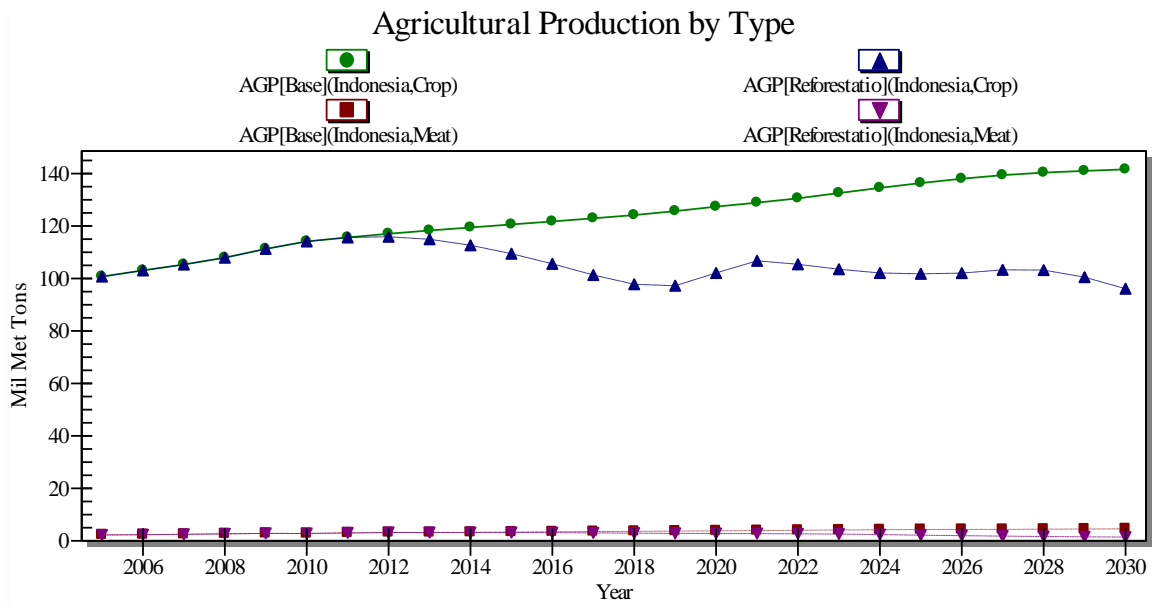
Source: International Futures, version 6.36 (2010)

The future looks moderately positive for Indonesia's socioeconomic indicators according to the IFs base case, but the cash transfer scenario increases the level of the country's success. The final government evaluation of the CCT program, formally called PNPM Generasi, found that it had a positive impact on the 12 indicators it was targeted to address. The strongest improvements in health indicators were the

frequency of weight checks for young children and increased number of iron sachets received by pregnant mothers through antenatal care visits. Overall there were dramatic increases in mother's and children's reception of maternal and child health services. Education indicators had also improved, particularly in regards to school participation rate among primary school-age group.⁴⁴ As the PNPM Generasi program was just developed in 2007, further evaluation is needed to monitor the long-term impacts of the project on communities throughout Indonesia.

The IFs model shows that the second scenario, implementing the reforestation initiative, would also yield positive results when appropriate measures are taken to balance the conversion of agriculture land to forest. The base case shows that there is a reduction in forest land in Indonesia until the year 2093 when it will begin increasing. Eighty years from now may be too late for the trend to turn positive, as the level of devastation could have irreversible effects as biodiversity and the quality of forest is lost. The scenario shows that by 2030 Indonesia will have 163.9 million hectares of forest compared to 89.27 in the base case. This 74.63 million hectare increase is not out of reach, considering the government has made plans in recent years to rehabilitate 60 million hectares of forest through one bid. The majority of the increase in forest land is taken from 'other' land use, followed by grazing land, then crop land. Converting agricultural land into forest has a direct effect on agricultural production as shown in Figure 5.3 below:

Figure 5.3 Changes in Agricultural Production

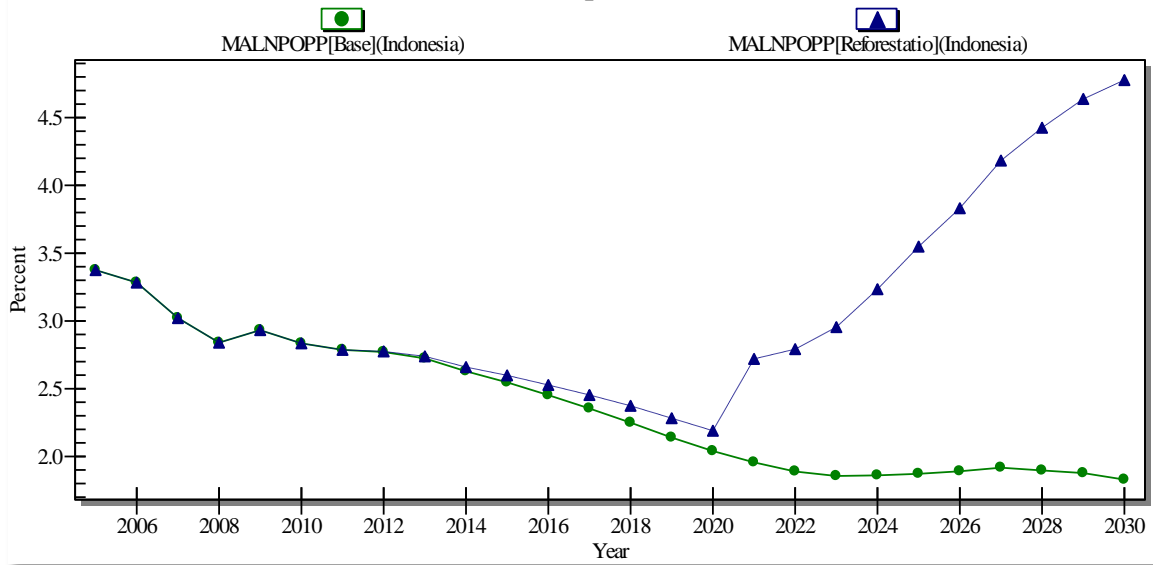


Source: International Futures, version 6.36 (2010)

As the figure shows, this initiative would cause a 68% reduction in crop production and a 31% reduction in meat production. Though there is a significant rise in the amount of agricultural imports compared to the base case to compensate for the loss in production (26.6% increase), this does not prove sufficient to meet the population's nutritional needs as evidenced by the 3% increase in the number of malnourished people – almost 8 million people (Figure 5.4 below):

⁴⁴ World Bank, September 2010, 50

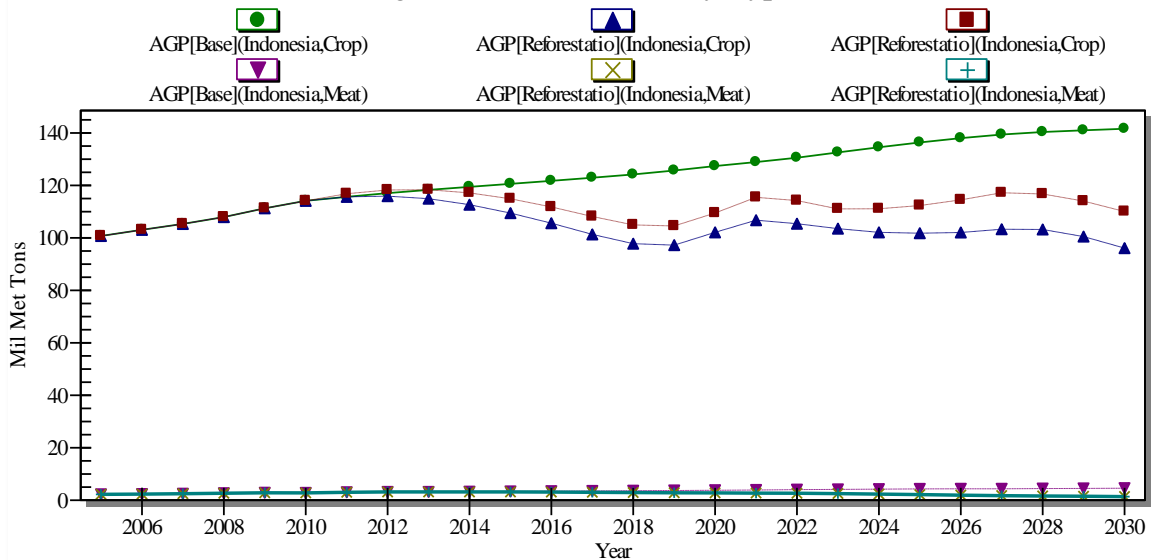
Figure 5.4 Changes in Level of Malnourishment
Malnourished Population, Percent



Source: International Futures, version 6.36 (2010)

To balance the intervention, agricultural production was increased. This could realistically be achieved through improved technology use on the smallholder farms which comprise the majority of the agricultural land areas. The results of balancing the intervention through increasing the agricultural yields multiplier on agricultural production is shown in Figure 5.5 below. The green line is the base case, blue is the initial intervention and the red line is the added increase in agricultural yields.

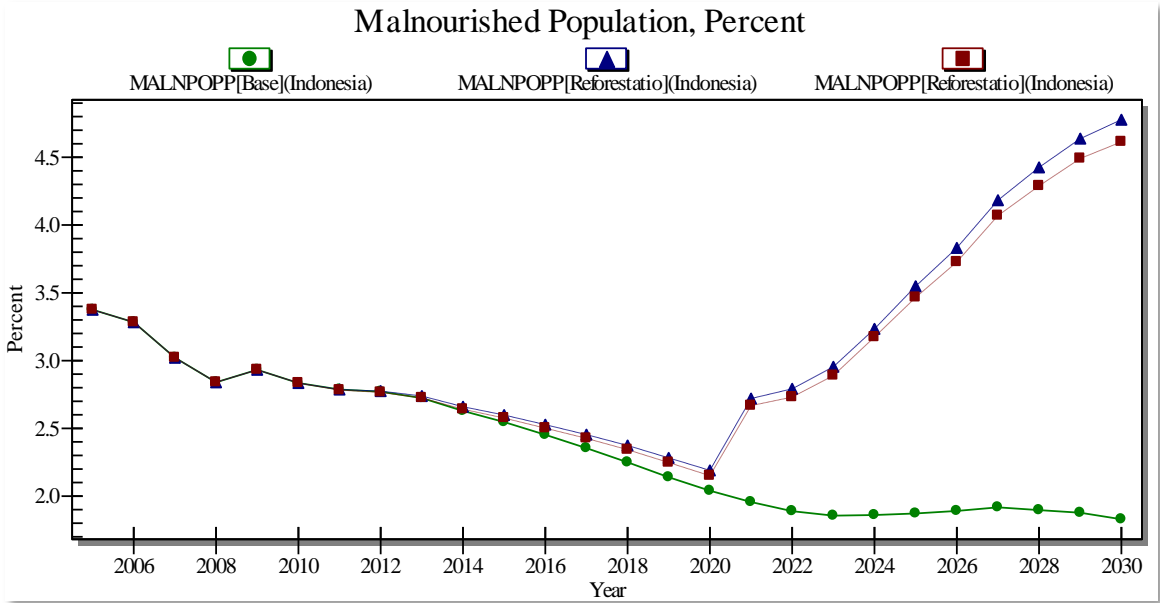
Figure 5.5 Improvements in Agricultural Production
Agricultural Production by Type



Source: International Futures, version 6.36 (2010)

The updated scenario does show an increase in agricultural yields, as could be expected, though it still does not meet that of the base case scenario. The effect of this on malnutrition is shown in Figure 5.6, where again the green line represents the base case, the blue is reforestation alone and the red line integrates an increase in agricultural yields.

Figure 5.6 Improvements in Malnutrition
Malnourished Population, Percent



Source: International Futures, version 6.36 (2010)

This intervention decreases the level of malnourishment by 0.164%, not a significant decrease, but one that lessens the number of malnourished people by 450,000. I did not want to increase the agricultural yields more than 1.2 since that would be an unrealistic intervention. One strategy to further improve the level of malnourishment could be the reduction of TFR, though since Indonesia has drastically improved its population growth and is due to reach replacement levels within this time period, I don't think this is a realistic option.

Figure 5.7 below shows the effects of the cash transfer, corruption and reforestation initiatives on indicators monitored by the national development program.

Figure 5.7 Effects of Scenarios 1&2 on Select Development Indicators

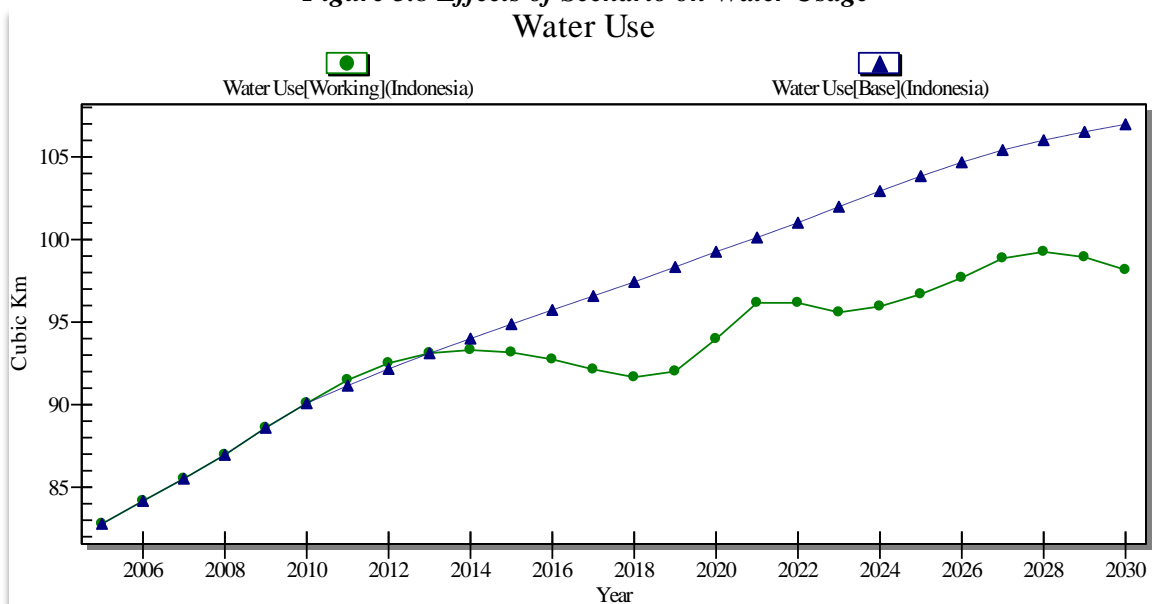
Indicator	2010	2030	
		Base Case	Scenarios 1&2
GDP per capita PPP (Thousand \$)	3.201	4.891	5.021
GDP growth rate (Percent)	3.481	2.722	3.206
Population with < \$1/Day (Percent)	10.15	3.609	3.018
Population Growth Rate (Percent)	1.083	0.422	0.426
Literacy (Percent)	93.15	99.78	99.78
Life Expectancy (Years)	71.69	74.82	74.89
Infant Mortality (per 1,000 births)	24.61	14.79	14.85
HIV prevalence	0.09	0.064	0.064
Corruption Perception	2.275	2.633	6.652
HDI	0.763	0.826	0.828

Source: International Futures, version 6.36 (2010)

All indicators in the new scenario show positive improvement over the base case except for population growth rate (a negligible increase) and infant mortality. The increase in mortality rate is tied to the loss of agricultural production and the subsequent effect on malnutrition. Increasing the level of imports is one option to address this issue, as is converting a percentage of production for exports into production for domestic consumption.

An added dividend of this initiative is the effect it has on water use (see Figure 5.8 below), decreasing usage from 107 to 98.16cm³. This is due to the fact that most water use is for agricultural irrigation, thus as the agricultural area is decreased so is the level of water usage. Another improvement was a reduction in the level of carbon dioxide in the atmosphere by 4.4PPM, reaching 450PPM by 2030. This is in alignment with the target of the U.S. Presidential Climate Action Project and offers promise that the world can start to change courses if appropriate collaborative action is taken.

Figure 5.8 Effects of Scenario on Water Usage
Water Use



Source: International Futures, version 6.36 (2010)

As of now the Millennium Development Goals (MDG's) are the guiding forces shaping development policy, with the explicit target date of 2015 for achieving the eight broad goals. Though my time horizon is set at 2030, surpassing the MDG target date, it will allow for the slow introduction of a complex series of interventions which could prove to be more sustainable and are aligned with the country's existing development strategies.

The results from the IFs model do show further progress towards meeting the national development goals by improving environment, health, education and corruption measures, but it must be stated that no forecast can ever be entirely accurate and is based on a high level of uncertainty. The level of each intervention was based on available knowledge and was assumed to be reasonable, but aggressive enough to effectuate change. This is only one possible future scenario which provides an alternative to the assumed progression of the country-there are many other possible interventions which could address key development issues in Indonesia.

5.2 Policy Challenges

The ultimate goal of implementing this package of reforms is to reverse the devastation on the environment caused by decades of stripping the land of its natural resources for short-term economic gain. As Indonesia has made the shift from an agricultural to a manufacturing economy, thus diversifying its income, it has the opportunity to effectuate positive environmental changes. However, implementing these policies will face challenges from those who are unable and unwilling to financially absorb the shocks caused by subsidy reductions and the decline in agricultural land. Monitoring mechanisms need to be put into place to protect the reforested areas from illegal logging, which has received recent global attention as a critical problem in the country. The corrupt governance system allowing for such practices needs to be further cleaned if progress is to be made in adhering to existing environmental law and bringing transparency to governance.

Both the community and household CCT face additional challenges in ensuring equitable access to services. Supply shortages, both in medical supplies and junior secondary schools in particular, quality of services due to increased beneficiaries, and the extra burden of administration and management imposed on newly formed regional governments are serious threats to the effectiveness of the CCT programs. The marked improvements in education and health as a result of the CCT program and anti-corruption efforts places extra pressure on the government to provide quality employment for a growing population of educated citizens entering the labor force. Currently, over 40% of 15-24 year olds with completed senior secondary school in the labor market are unemployed⁴⁵, partly due to lack of information about employer expectations but largely due to growing employment demand without a correlating supply. Regional governments and the private sector should collaborate to ensure youth exiting the education system have the requisite skills to successfully gain and retain employment.

The reforestation effort faces land tenure and access issues related to the rights of communities and the role of private enterprises. After decentralization, the relationship between the sectoral ministries and the regional authorities are more collaborative than top-down as the communities recognize their increased power and leverage they have to have their voices heard. If the central government wants to continue to curb conflict, the rights of the traditional peoples demanding a community-based approach to natural resource management must be respected. The unique adoptive management and land tending models of these communities makes formulation of general policies nearly impossible. The central ministries need to play an active role in evaluating the lessons learned from the province-based service provision models in other recently decentralized countries in the region, providing resources to provinces to effectively train and manage the social and environmental service workforce and change its role in relationship to regional governments.

In looking to the future, Indonesia must focus its attention away from environmentally destructive practices for economic gain. Given the fragile nature of the state post economic crisis and the increasing global prices of oil, which is heavily consumed by the industrializing nation with a growing consumer population, the inclination to expand cash crops such as palm oil and engage in strip mining for increased coal use will be high. However, the country must focus on enhancing existing and integrating new technology into the agricultural and services sectors to make production more efficient as well as continuing to diversify its economy through the transition into manufacturing. Tapping in to its huge stock of geothermal resources as a source of renewable energy is a viable option to transition away from the use of fossil fuels. Positioned on the ring of fire, the country holds 40% of the world's potential geothermal resources.

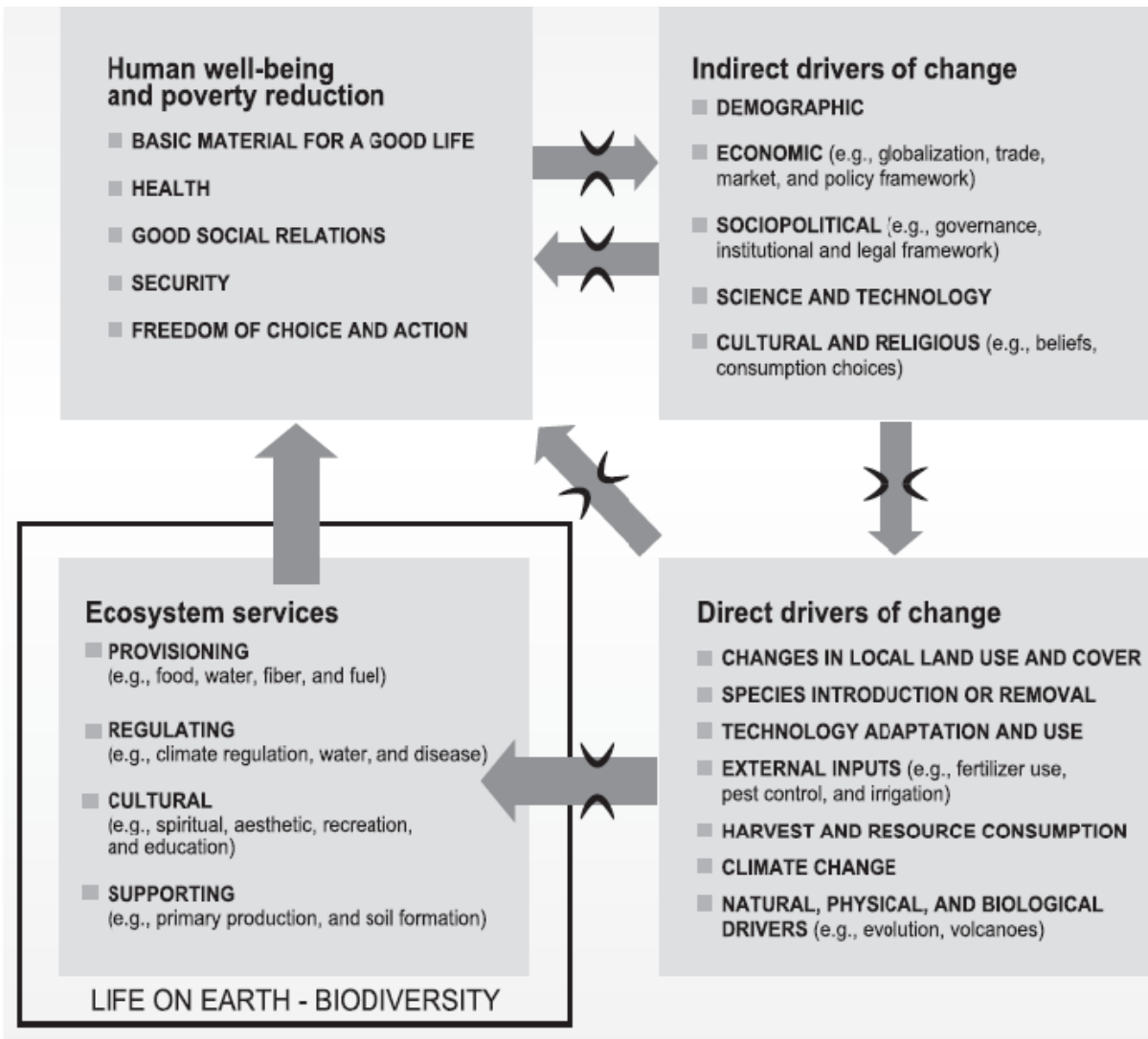
⁴⁵ World Bank, September 2010, 46

6. Conclusion

Providing a careful historical analysis of the factors that shape a country's growth path is the first step to understanding its future trajectory and aids in informing policy and action. Though it is framed on uncertainty, the IFs model provides detail to general understanding of growth trends and offers a glimmer of hope for the future. Given its limitations, the model shows that an approach to reverse the environmental damage to Indonesia while protecting the livelihoods of the population is possible. It also presents a realistic challenge to policy implementation, whereby following one goal has negative spillover effects on other sectors and parts of the global system. It is ultimately up to the policymaker and the population he/she represents to decide which goal to pursue, based on feasibility of implementation and social values.

This paper covered the major development issues chosen by the author and in no way provides comprehensive coverage of all of the challenges the country faces. In reality, the Indonesian government and various ministries are working to tackle a complex array of development challenges to meet the holistic needs of its population and respond to external pressures. The government is continuing to engage in diverse activities that will continue domestic growth and expand its partnerships with external agencies to garner support in its effort to achieve its development goals. Such collaborative efforts offer opportunities for Indonesia's growth through an influx of funding for capacity building and technical assistance projects. The government has a real opportunity to reverse environmental damage, reduce poverty and grow the economy if it continues to pursue necessary policy reforms with support from its population and collaborative partners.

Appendix 1: Drivers of Environmental Change



Source: Millennium Ecosystem Assessment (2003)

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