Global Majority E-Journal

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About the Global Majority E-Journal
The Global Majority E-Journal is published twice a year and freely available online at: http://www.american.edu/cas/economics/ejournal/. The journal publishes articles that discuss critical issues for the lives of the global majority. The global majority is defined as the more than 80 percent of the world’s population living in developing countries. The topics discussed reflect issues that characterize, determine, or influence the lives of the global majority: poverty, population growth, youth bulge, urbanization, lack of access to safe water, climate change, agricultural development, etc. The articles are based on research papers written by American University (AU) undergraduate students (mostly freshmen) as one of the course requirements for AU’s General Education Course: Econ-110—The Global Majority.

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The Effect of Education on Brazil’s Economic Development

Lindsay Sandoval

Abstract
Due to robust economic growth, Brazil has become an economic powerhouse in both Latin America and the developing world. Despite recent success, inequality still persists at surprisingly high levels. The substandard education system is a contributor to this inequity; however, education reform also represents one of the most effective tools for further growth and a more equal distribution of income. This article investigates how Brazil’s failure to raise school learning standards incurs negative long-term effects and outlines the economic benefits of a higher quality education. It reviews the demographic window of opportunity, especially with regards to education, the links between poor education, poverty and inequality, and how inequities hamper economic growth. Finally, the article examines the successes of recent education reforms and how more efficient social spending could bolster economic growth.

I. Introduction
Brazil is arguably the preeminent economy in Latin America. As the fifth largest country in the world (in both land area as well as population), Brazil benefits from vast natural resources and human capital. Largely, the exploitation of both these resources has spurred substantial economic growth in the past forty years. However, human development has not risen proportionally to economic growth. Furthermore, though average gross domestic product (GDP) per capita has increased over the years, inequality remains at surprisingly high rates. A significant contributing factor to persistent income inequity is the low attainment and low quality of education in Brazil.

Abadzi (2007) points out that most Brazilian children attend both primary and secondary school, but suffer from some of the highest rates of grade repetition and dropout rates in the world as well as high disparities in the quality of education across rural and non-rural populations. Furthermore, Abadzi (2007) explains that Brazilian schools suffer from several systemic issues:

2 Cunningham and Jacobsen (2008).
Too much time is spent on organization, which wastes valuable classroom time. Additionally, teachers are often absent or off task, diminishing students’ ability to concentrate on difficult material. Together, the problems of absenteeism and time mismanagement often result in Brazilian children dropping out, failing classes, and graduating without being able to read at an adequate level.

Investment in quality education is imperative to continue economic growth. Brazil currently is undergoing a demographic window of opportunity, and dependency ratios are projected to fall until 2025. To foster a healthy, educated workforce, policymakers must make more investments in effective education methods. Brazil spends about the same percentage of GDP on public education as other Latin American countries; however, gross inefficiencies in the education system undermine this investment. Moreover, there is increasing evidence that education has strong economic returns and constitutes a major source of development. Reforms that demand more efficient use of time and enhance the quality of education are absolutely necessary to sustain growth. This paper focuses on current failures in the Brazilian education system, and possible policy implications that can bolster development. It shows that an education reform is key to Brazil’s economic development.

II. Brief Literature Review

As an emerging economy, much research concentrates on Brazil’s economic development. A wide variety of publications also discuss the economic benefits of a higher quality education, demographic shifts, systemic failures in the education system, and policy implications to correct resulting inefficiencies. The following four publications are some of the most recent and most comprehensive research papers related to these issues, either referring or focusing on Brazil.

- A World Bank policy research paper “Absenteeism and Beyond: Instrumental Time Loss and Consequences” written in 2007 by Helen Abadzi, analyzes systemic problems in education in several countries including Brazil. Her findings reveal a trend in developing nations: teachers are often absent from their posts and use their time inefficiently. Further investigation suggests that these practices have social ramifications that undermine economic growth. More importantly, the paper has a thorough discussion of policy implications that encourage better teaching pedagogies as well as recommendations for decreasing rates of absenteeism. It also outlines both systemic failures and policy tools that may improve the quality of education.

- Another 2007 World Bank policy research paper by Eric A. Hanushek and Ludger Wößmann explores the link between educational quality and economic growth. According to their analysis, policies that aim to improve education systems in developing nations have significant economic returns. The authors find that long-term reforms to education will substantially increase GDP compared to countries that make no changes. Additionally, the research establishes that quality of education has more implications on economic growth than merely increasing the quantity of schooling. Finally, the report provides several broad policy initiatives that help students acquire cognitive skills and increase teaching quality. The claim

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3 Queiroz and Turra (2010).
4 Queiroz and Turra (2010).
5 Abadzi (2007).
6 Abadzi (2007).
of this report rests heavily on these findings, asserting that education is among the most important investments the Brazilian government can make to sustain economic growth.

- Bernardo L. Queiroz and Casio M. Turra’s (2010) report, entitled “Window of Opportunity: Socioeconomic Consequences of Demographic Changes in Brazil” discusses recent economic growth in Brazil in relation to population dynamics. Queiroz and Turra attribute a large working age population and falling dependency ratios as significant causes of recent growth. However, if Brazilian policymakers fail to reallocate public funds to help younger generations, the economy will miss a rapidly closing demographic window of opportunity. The analysis suggests that education reform is paramount to continue economic development and action must be immediate.

- Finally, the analysis by Alain de Janvry, Frederico Finan and Elisabeth Sadoulet (2006) is helpful in assessing the efficacy of cash transfer programs in Brazil. The paper provides a framework for how the policies are implemented and illustrates how the program increases attendance and decreases dropout rates. It comes to the conclusion that Brazil’s cash transfer programs are an efficient use of government money that has the potential to alleviate poverty and that further policy innovations should follow these types of programs.

III. Empirical Background

Brazil’s GDP has grown dramatically over the past 40 years, reaching close to US$1.6 trillion in 2009. However, as shown in Figure 1, growth rates have been highly volatile and were low in the 1980s and 1990s. Whereas annual GDP growth averaged 7.3 percent between 1961 and 1980, it averaged only 2.1 percent during 1981-2000, before accelerating again during 2000-2009.

![Figure 1: Brazil’s GDP Growth, 1961-2009](image)

Source: Created by author based on World Bank (2011) World Development Indicators (as posted on the World Bank website; downloaded on June 7, 2011).

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7 World Bank (2011).
Several factors had caused the slowdown during the 1980s and 1990s. First, the Brazilian government had accrued massive amounts of public debt, which discouraged investment. Second, as shown in Figure 2, income inequality (measured by the Gini index) rose sharply during the 1980s. Despite some reduction in inequality during the last two decades, Brazil is today the 12th most unequal society in the world.

Under the direction of President Fernando Henrique Cardoso (1995-2002) and President Luiz Inacio Lula da Silva (2003-2010), Brazil has brought inflation under control and achieved significant financial stability. Additionally, growth was facilitated by both diversifications in the industrial sector as well as an advanced agricultural sector. These improvements created more confidence for foreign investors and spurred an overall increase in international trade. Because of this modernization, Brazil is currently considered a key force in the global economy and is expected to be a leading country in the future.

Figure 2: Income Inequality in Brazil, 1981-2009

![Graph showing income inequality in Brazil from 1981 to 2009.](image)

Source: Created by author based on World Bank (2011) *World Development Indicators* (as posted on the World Bank website; downloaded on June 7, 2011).

Despite the large gap in income between the rich and the poor, absolute poverty has decreased significantly during over the past 30 years, and especially since 2004. In purchasing power parity (PPP), the percentage of the population living below $2 a day has dropped from more than 35 percent in the early 1980s to 9.9 percent in 2009, and the percentage of the population living below $1.25 a day has dropped from more than 20 percent in early 1980s to 3.8 percent in 2009.

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8 Queiroz and Turra (2010), p. 5.
10 Throssell (2010).
Brazil has also experienced demographic changes that present economic challenges as well as opportunities. As shown in Figure 4, life expectancy has increased steadily since 1960, which implies that more stress is placed on some public programs, especially the pension system. Despite increasing life expectancies, the age dependency ratio, defined as the ratio of dependents (people younger than 15 years or older than 64 years) to the working-age population (those ages 15-64) has fallen in Brazil (Figure 5).

Source: Created by author based on World Bank (2011) *World Development Indicators* (as posted on the World Bank website; downloaded on June 7, 2011).
Like in most developing countries, declining fertility rates result in a growing working-age population, and constitute a demographic window of opportunity, which will however close soon. As pointed out by Jaeger (2010, p. 1), while Brazil will gain approximately 2 million new workers in the next two decades, the population will become “a net negative in terms of per-capita growth.” This suggests there is a demographic imperative to allocate investments to this burgeoning young population to minimize the negative effects of forthcoming demographic changes. Brazil’s recent economic growth has aided its modernization efforts and has even lifted many out of poverty. However, the forthcoming closing of the demographic window suggests that Brazilian policymakers need to make more pragmatic investments, especially in the education sector.

IV. Discussion

The subsequent discussion shows that education is perhaps the most effective way to bolster future growth in Brazil. We first examine the impact of education on economic growth, review then Brazil’s demographic window of opportunity, summarize systemic failures in Brazil’s education system, examine the relationship between education and poverty, and close with some policy implications.

IV.1. The Case for Education

Studies undertaken in the last decade suggest that there is an increasing importance for countries to foster strong educational polices in order to spur development. According to Hanushek and Wößmann (2007, p. 1), “educational quality – particularly related to developing countries – is THE key issue” for development. Cognitive skills gained in primary and secondary education historically bring about more economic returns. Hence, there are two chief ways in which education can be enhanced: through increasing quantity and quality.
By increasing the amount of schooling, students have more time to develop basic skills in disciplines such as reading, mathematics, and science. Hence, bolstering the quantity of education should foster human capital, hopefully bolstering productivity in the long-term. Additionally, a more educated workforce has a higher capacity for innovation, helping bring about structural changes to the economy. According to Hanushek and Wößmann (2007, p. 24), “several recent studies suggest that education is an important both as an investment in human capital and in facilitating research and development and the diffusion of technologies.” Hence, increasing the quantity of education helps students gain more familiarity with technology, which encourages future innovation and productivity. However, due to limited research on the subject, Hanushek and Wößmann (2007) are skeptical to make any definitive links between development and the quantity of schooling.

Interestingly, Hanushek and Wößmann (2007) articulate a clearer relationship between the quality of education and economic growth. After reviewing the International Adult Literacy Survey, they conclude that people who had a more quality education earned better scores than those who had more schooling. By focusing on developing cognitive skills with better methods, “income levels improve mainly through speeding up technological process rather than shifting the level of production function or increasing the impact of an additional year of schooling.”

Further analysis suggests that enhancing the quality of education has large benefits for economic growth.

Hanushek and Wößmann also studied the test scores from countries that voluntarily participate in the International Association for Educational Achievement (IAEA). While plotting test scores against initial levels of GDP per capita, Hanushek and Wößmann (2007, p. 26) found that “higher tests performance would yield around one-percentage point higher annual growth rates.” Moreover, these investments have better returns in developing countries. After comparing test scores from developing and developed countries, the results were similar when educational quality was emphasized. Developing quality education for all students constitutes an effective way to generate economic growth and a powerful tool for developing nations. However, challenges still remain. Without sound education systems, students languish in poor schools and do not acquire skills that benefit the economy.

IV.2. Demographic Window of Opportunity

Like most developing nations, Brazil is currently experiencing a demographic transition. Due to a dramatic decline in birth rates (see Figure 6) and a limited increase in life expectancy (Figure 4 above), the working age population will continue to grow until about 2025. This period is often referred to as a “demographic window of opportunity” because changes in age structure can have significant economic benefits if necessary investments are made before dependency ratios increase. Principally, the growth of the working population creates increases in income, and this population continues to accumulate wealth as it ages. This process boosts GDP over time. Additionally, low dependency ratios also allow for more public investment since fewer resources are directed to pension programs. According to calculations undertaken by Queiroz and Turra

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14 Queiroz and Turra (2010), p. 5.
(2010, p. 20), if Brazilian policy focuses on this generation of workers “demographic dividends could raise GDP growth per effective consumer by 2.48% per year on average.”

Figure 6: Crude Birth Rates (per 1000), 1960-2009

![Birth Rates Graph](image)

Source: Created by author based on World Bank (2011) *World Development Indicators* (as posted on the World Bank website; downloaded on June 7, 2011).

However, evidence suggests that policymakers failed to take complete advantage of the demographic changes in recent years, mostly due to the generous pension system in Brazil. Not only does the program detract from further investment in public programs, but generous benefits also encourage older Brazilians to leave the workforce earlier. This increases the pension to workers ratio and becomes a burden on the economy. Maintaining the costly pension system discourages investment in the younger generations and does not adequately convert the demographic changes into economic growth. To take advantage of falling dependency ratios, Brazilian policymakers have a narrow window to alter public programs that bolster investment in future human capital.

IV.3. Systemic Failures in Brazil’s Education System

In Brazil, school attendance is mandatory for eight years: four years are to be spent in primary education and another for years in secondary school. In 1988, the Brazilian government mandated that 18 percent of its budget should be used for education. Indeed, as shown in Figure 7, Brazil’s public spending on education as a percentage of GDP has nearly doubled since 1970 and now hovers around 5 percent. This rate is actually higher than the Latin American average, which stands at 4 percent of GDP. Overall, Brazil ranks fifty-fifth in the world for

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education expenditure as a share of GDP.\textsuperscript{19} Therefore, Brazil’s education system does not suffer severely from a lack of funding, but more so from a mismanagement of resources.

**Figure 7: Education Spending (as percent of GDP), 1970-2007 (available years)**

![Education Spending Graph]

Source: Created by author based on World Bank (2011) *World Development Indicators* (as posted on the World Bank website; downloaded on June 7, 2011).

Alarming statistics illustrate the severity of problems in the current Brazilian education system. Two-thirds of all students are functionally illiterate by the time they graduate and “more than 60 percent of those in school do not reach a level of basic literacy in cognitive skills.”\textsuperscript{20} As described earlier, in order for education to result in substantial returns it must establish cognitive proficiencies. Even more disturbing, only 8 percent of Brazilian students reach literacy.\textsuperscript{21} The literacy rate of adults over age 15 is only 88.6 percent; in contrast, the average literacy rate for Latin American countries is 97.3 percent.\textsuperscript{22} Years of failing policy have created a generation of workers who are uneducated, which will hurt development in the long term.

Similar to the rest of Latin America, Brazil suffers from high dropout rates and high repetition rates. The average dropout rate in Latin America is around 33 percent, and the average grade repetition rate is 12.4 percent. Although Brazil has a relatively low dropout rate between 20 and 25 percent, grade repetition is more severe in Brazil than in Latin America. In Brazil, 21.9 percent of Brazilian secondary students have to repeat grades.\textsuperscript{23} Based on the latest data available in World Bank (2011), grade repetition rates are now more common among children in secondary school (Figure 8) than among children in primary school. Evidently, these students cannot command material presented to them, which constitutes a significant systemic failure. As

\textsuperscript{19} CIA (2011) World Factbook.
\textsuperscript{20} Hanushek and Wößmann (2007), p. 53.
\textsuperscript{21} Hanushek and Wößmann (2007), p. 53.
\textsuperscript{22} World Bank (2011).
\textsuperscript{23} United Nations (UN) Economic Commission for Latin America and the Caribbean (ECLAC) (2002).
Cardoso and Verner (2008, p. 2) suggest, “high enrollment rates do not translate into high completion rates or into a high level of schooling by school leavers.”

**Figure 8: Primary and Secondary Repeaters (percent of total enrollment), 1970-2005 (available years)**

Cardoso and Verner (2008) hypothesize that a rise in teen pregnancy contributes to these discouraging statistics. They point out (p. 1) that in 2000, teenage births accounted for 20 percent of all births, a dramatic shift from the 9 percent in 1980. As Cunningham and Jacobsen (2008, p. 6) point out, “family background has an impact on education attainment and grade repetition.” For many girls, families hardly discourage the decision to leave school. To achieve quality education, policies must attack the high dropout and grade repetition rates.

Additionally, studies suggest that an inadequate use of classroom time is one reason why funding does not correlate with higher quality. High rates of teacher absenteeism have devastating effects, such as decline in reading fluency, high dropout rates, and high grade-repetition rates. Studies conducted in the Brazilian state of Pernambuco (which suffers from significant poverty) illustrate these issues. After conducting unannounced visits to classrooms, researchers found that 40 percent of teachers had been reported missing in the town of Sertão de San Francisco. Moreover, even when teachers are in the classroom, they often talk among themselves and waste teaching time, or simply leave their posts and teach elsewhere. Compounding absenteeism is a lack of oversight. Seventy-four percent of log books, which track teacher attendance, were not filled out in Pernambuco schools. Teacher absenteeism remains a challenge for reform.24

Evidence also suggests that pedagogies used in Brazilian schools detract from retention and often do not bolster cognitive skills. Students need both individual support and hands-on activities to

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24 This paragraph is based on Abadzi (2007), pp. 21-24.
maximize growth in cognitive skills, but inefficient methods undercut the quality of education.\textsuperscript{25} Although schools in Pernambuco were relatively small (only containing 25 students on average), students did not receive individualized attention; in fact, teachers addressed the entire class 70 to 90 percent of the time. Moreover, hands-on activities and discussion with other students, which promotes better absorption of the material, were only used in 5 percent of class time. Teachers also spend too much time on organizing class, according to conventional U.S. standards. Whereas teachers should spend less than 15 percent of the school day for planning, teachers in Pernambuco used 27.9 percent of classroom time to organize. Students take advantage of the unstructured time and often become distracted. During class visits, researchers found that students were off task 21 percent of class time. In an attempt to expand education, methodologies and practices have become shallow, and the resulting inefficiencies have large implications on the quality of education.\textsuperscript{26}

These problems severely undermine the positive effects of education on economic growth. Even with greater government spending on education, inefficient use of funds and time in the classroom will not result in achievement gains. Unfortunately, impoverished schools often concentrate such systemic issues.

IV.4. Relationship between Education and Poverty

High dropout rates appear to stem from extreme poverty. Based on a survey by Cardoso and Verner (2006), conducted in Fortaleza (a region in northeastern Brazil with 402 favelas/slums and some of the highest rates of poverty in the country), 33 percent of students who did not complete schooling had experienced hunger in their lives.

Education remains a viable tool for poverty reduction. Based on a study examining the dynamics of earnings inequity, Cunningham and Jacobsen (2008, p. 15) concluded that “policies that attempt to equalize earnings-related characteristics across the whole population, say guaranteeing universal primary education and hopefully also secondary education, may do more to equalize earnings.” Additionally, better education attainment for women often results in higher returns.\textsuperscript{27} Fortunately, more and more women are attending college in Brazil (see Figure 9).

Quality education can diminish gender inequalities as well as break the cycle of poverty in poorer regions of Brazil, but as detailed in Abadzi (2007), these regions also suffer from a variety of inadequacies:

- Lower income regions, such as Ceará in Pernambuco, participate in fewer instructional activities that reinforce cognitive skills.\textsuperscript{28} In fact, teachers usually emphasize copying because it provides an easy way to command a classroom; unfortunately, these passive methods fail to engage students and encourage retention of the material.\textsuperscript{29}

- Teachers in impoverished regions are often undereducated themselves, and even avoid teaching material they have less command with. As Abadzi (p. 36) states, “the stresses of large classes, unresponsive students, and insufficient knowledge to deliver demanding curricula may make teachers avoid the tasks that they consider tedious.”

\textsuperscript{25} Abadzi (2007), p. vi.
\textsuperscript{26} This paragraph is based on Abadzi (2007), p. vi and p. 27.
\textsuperscript{27} Cunningham and Jacobsen (2008), p. 5.
\textsuperscript{29} Abadzi (2007), p. 15.
• Furthermore, poorer students, who already experience little instructional direction, are predisposed to a worse education that does not foster cognitive skills, and also leads to higher dropout rates.

**Figure 9: Female Tertiary School Enrollment (percent), 1960-2008 (available years)**

![Graph](image)

Source: Created by author based on World Bank (2011) *World Development Indicators* (as posted on the World Bank website; downloaded on June 7, 2011).

Quality education has the potential to bring about significant growth and poverty reduction; however, more initiatives are needed to overcome the inequity in the education system. One of such initiatives is the so called Bolsa Escola Familia program, which was launched in 1995 in Brasilia by then-governor Cristovam Buarque to provide education stipends for poor families. The program intends to achieve parity by attacking multidimensional effects of poverty in addition to providing better access to education. Applicants have a monthly income per capita of less than R$50 (extremely poor) or between R$50-R$100 (moderately poor), and usually receive between R$15 and R$95 per month. Families in the program agree to requirements that advance a human development agenda; for instance, children between the ages of 8 and 15 must attend 85 percent of classes and visit health clinics regularly.\(^{30}\) These not only increase access to education, but also attempt to alleviate other compounding factors of poverty, such as health and sanitation.

By 2003, Bolsa Escola expanded to nearly every Brazilian municipality and doled out more than $500 million to 11.2 million families.\(^{31}\) These programs “had a strong impact in reducing child dropout during the school year” and dropped grade retention rates from 26.4 percent to 22.4 percent.\(^{32}\) Clearly, these stipends are effective in increasing access to education for poor families. However, evidence suggests that these programs were targeted to children who were less likely to drop out due to prior history, which questions if funds are truly reaching the poorest families.\(^{33}\)

In any case, Bolsa Escola represents an innovative approach to expand education across the country.

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IV.5. Policy Implications

Education presents one of the most efficient ways to achieve economic growth and sustain development for Brazil. Especially in a period of demographic transition, Brazilian policymakers are in a unique position to make investments that will significantly increase GDP over the next decades. However, as discussed earlier, several systemic problems complicate this growth. Changes in current policy can restructure education and correct some of the inefficiencies. To reduce rates of poverty, policies should focus on improving conditions within the classroom. Thorough education that bolsters cognitive function will foster a generation of contributing workers. These efforts must be concentrated to the poorest regions, which generally receive the least quality education in the country.

As discussed earlier, a major problem in education for developing countries is teacher absenteeism, and several policy tools can mitigate this problem. Schools that update buildings and improve functionality may attract more teachers and encourage them to remain at their posts. Additionally, principals must enforce stricter penalties and oversight with absenteeism. For instance, clearer guidelines and positive reinforcement for punctuality would encourage teachers to make more efficient use of time. Moreover, salary increases may incentivize teachers to act more responsibly. Abadzi (2007, p. 42) suggests that schools in developing countries, such as Brazil, should attempt to curb absenteeism to 10 percent. If teachers arrive to class prepared, students will benefit from cohesive lessons that support cognitive development. Teacher absenteeism currently detracts from quality education.

However, reducing absenteeism tackles only part of the problem. Even if teachers show up to class, they often waste valuable time and engage in inefficient pedagogies. As Abadzi (2007, p. 35) notes, “assumptions about the pro-poverty alleviation effect of education may be unrealistic, given that the schools of the poor make less effective use of instructional time.” Before Brazilian governments commit to increasing education funding, structures must be put in place to ensure that quality will be enhanced. Indeed, “the time devoted to learning the material prescribed by the curriculum may be the crux of education ‘quality.’” Providing more aid to teachers may be an effective tool for organization and lesson-planning. Again, incentives like salary increases for teachers who demonstrate dedication towards good time management will help students focus on material and bolster absorption of the material.

Additionally, more efficient teaching models, such as phonics for reading, are more expedient for learning. With these methods, policymakers should aim to use 80 percent of time as a benchmark for developing countries. Since research suggests that adequate time is essential for quality education, increased oversight and supervision of teachers are paramount for reform. With better time management and teaching, students should be able to achieve at higher rates. To increase student achievement, teachers must emphasize basic skills, such as reading, language, and math. However, enhancing accountability systems may provide a more accurate measure for educational quality and encourage teachers to improve teaching methods. Programs should

37 Abadzi (2007), p. 34.
incentivize teachers with salary increases if their students improve on standardized tests.\textsuperscript{41} This means that schools may eliminate traditional tenure programs to shift accountability to teachers.

Programs that address other aspects of poverty will also encourage higher attendance, which is essential for quality education. Voucher programs, as previously discussed, significantly improve accessibility and reduce dropout rates. Other reforms, such as lowering the cost of transportation and bolstering public health programs, would help increase attendance and boost cognitive development in the long term.\textsuperscript{42} Policymakers, therefore, should concentrate on reforms that encourage attendance and accessibility, especially in poorer regions. More importantly, efficient use of time should maximize the absorption of material in order to improve cognitive function. Once schools provide quality education, Brazil can fully take advantage of demographic changes and foster the next generation of workers.

Finally, some social programs in Brazil – primarily the pension system – may undermine the benefits of demographic changes unless changes are made. The public transfer system siphons too many funds from education and development in human capital. As Queiroz and Turra (2010, p. 21) suggest, “given the current structure of public transfer system in Brazil, the government will observe a faster growth in the number of beneficiaries than contributors, and it will enjoy for a very short period the benefits brought by the demographic transition.” To fully take advantage of demographic changes, policymakers must ensure that funding the hefty pension program does not take away from further education spending.

\textbf{V. Conclusion}

Brazil is the preeminent economy of Latin America and has reaped some benefits of economic growth especially during the last decade. However, it is increasingly apparent that the growth will perhaps not be as robust in the future. Thus, it is important to direct investment behavior to programs that take advantage of current demographic changes. Falling dependency ratios translate into a growing working population, which will sustain economic growth. However, as this window of opportunity is projected to close in 2025, policy changes must be rapid and effective.

Moreover, education can generate growth over the long term. These benefits are dependent on quality education, which is evidently not accessed equally by all Brazilian students. Across the country, there are several failures within the education system. According to studies conducted by the World Bank, many schools waste too many valuable resources and time in the classroom. Additionally, teachers often use ineffective pedagogies that do not emphasize hands-on activities or offer enough personal time with students. Often, these schools do not adequately develop cognitive skills that are important for child development. Given these challenges, raising education expenditures does not guarantee better student achievement unless specific reforms are implemented. These changes are perhaps more necessary for impoverished regions, which concentrate systemic issues.

Clearly, the need for reform is urgent. The success of cash transfer models like the Bolsa Escola Familia program offers some optimism. This program not only reduces dropout rates but also advances a social agenda that aims to alleviate the multidimensional causes of poverty.

\textsuperscript{41} Cardoso and Verner (2006), p. 16.

\textsuperscript{42} Cardoso and Verner (2006), p. 16.
Additionally, scrapping traditional tenure systems may encourage teachers to improve their teaching techniques. Principals and administrators, on the other hand, need to take more responsibility by providing staff with stricter guidelines regarding absenteeism.

In conclusion, if Brazil is to achieve its projected success, policymakers must seriously tackle the inadequate education system. Not only does quality education provide an engine for future economic growth but it also bolsters Brazil’s human development.

References


Malawi: A Development Puzzle?

Salman Dossani

Abstract

This article focuses on the various dimensions of poverty in Malawi. It reviews Malawi’s progress in terms of income poverty and human development. It illustrates Malawi’s puzzling performance of failing to raise its people’s income over most of the last 30 years but making considerable progress in terms of improving non-income human development. It analyzes some of the sources for this discrepancy between GDP growth and human development by looking at the access to safe water and sanitation, corruption and protectionism.

I. Introduction

Located in southern central Africa lies Malawi (once known as Nyasaland), a nation of currently about 15.3 million people. With a total area of approximately 110,000 square kilometers, Malawi is divided into four-fifths of land and one fifth of water. With a purchasing power parity (PPP) adjusted GDP per capita of only $794 in 2009, Malawi is one of the poorest countries in the world. Attracting very little of the world’s media, Malawi continues to strive in order to imprint itself on the world map. Despite being small in terms of population and land area, the nation is privileged to be vibrant, exotic, and zestful. Distant from the lavish lifestyles in the concrete jungles of the west, Malawi boasts exhilarating mountain top views, immaculate golden sandy beaches, and companionable people, thus its name “the Warm Heart of Africa”. Much of Malawi is undeveloped and therefore most natural features remain untouched.

Despite the astonishing beauty and tranquilizing nature, the people of Malawi suffer from low standards of living. Ever since gaining independence on the 6th of July 1964 from Britain, Malawi has been a peaceful and democratic nation. Only recently has the current President of Malawi, Mr. Bingu wa Mutharika, been accused of violating human rights and exercising autocratic leadership.1

1 President Bingu wa Mutharika died on April 5, 2012 of a heart attack at the age of 78 (which was after the writing of this article had been completed).
Influenced by the Middle Eastern wave of protests, Malawians have launched their own version of protests to dispossess the current president. Deflated export sales, lack of foreign currency, prevailing poverty, rising commodity prices and misappropriation of resources by the government synthesizes the reasons for such an upheaval. The economic woes have created uncertainty and volatility in the Malawian economy, which has depressed confidence levels throughout.

Moreover, being heavily dependent on the agricultural sector, Malawi fails to reduce its reliance on loans and grants given by various international development institutions and industrialized countries. The resources provided help facilitate the poor with basic needs, education and infrastructure. Although monetary resources are frequently being injected into the Malawian economy, how has this process aided Malawi towards fighting poverty?

This article reviews Malawi’s progress with regards to reducing poverty. Using data since the 1980s, a variety of indicators pertaining to economic growth and social development will be analyzed. The article is structured as follows. Following this introduction, the next section provides a brief review of the literature. Section III reviews Malawi’s puzzling discrepancy in terms of making very little progress in terms of GDP per capita and GDP growth while outperforming the average of Sub-Saharan Africa (SSF, i.e., including all income levels) in terms of various social indicators like life expectancy and infant mortality. Section IV analyzes then some possible explanations for this development puzzle before Section V provides some conclusions.

II. Literature Review

Given that Malawi is one of the poorest countries in the world, several studies have been conducted by analysts who seek to investigate the root causes of poverty in Malawi, particularly in rural areas. Although many of the studies have focused on looking at criteria that stand as potential actors in alleviating poverty in Malawi, there are various research analysts referring to obstructive agents hindering prospects of the rural poor in Malawi. The following paragraphs summarize some of the more prominent literature.

*The End of Poverty: Economic Possibilities of Our Time,* written by Jeffery Sachs (2005), is an award winning book which offers a set of solutions to developing countries tangled and woven in economic, political, environmental and social problems. One chapter in the book focuses on Malawi. Sachs (2005, p. xvi) outlines clearly the effect of the 2005 drought that devastated the lives of many across Malawi: “In August 2005, my wife and I returned to villages of Ntandire and Chilota in Malawi that we had visited in 2002. Once again these villages were throes of drought and extreme hunger. One of the young children and a young man we had met in 2002 [......] were now dead, just three years later.” While the 2005 drought was clearly the root cause, Sachs (2005) makes clear that a fairly trimmed down funding was the main cause for the perfect storm in Malawi, it was a death warrant given to Malawi by the international community.

Another very prominent study is Malawi’s Poverty Reduction Strategy Paper (PRSP), formally entitled *Malawi Growth and Development Strategy: From Poverty to Prosperity 2006-2011.* This document of the Government of Malawi (2006) seeks to provide an in-depth analysis of poverty in Malawi and the necessary policy interventions to move towards prosperity.

Ellis, Kutengule and Nyasulu (2003) provide a critical viewpoint of Malawi’s previous PRSP and Malawi’s decentralization strategy, based in micro level investigations of rural livelihoods.
Their research finds that poor rural farmers are not only obstructed in increasing productivity and welfare by poverty but that Malawi’s decentralization strategy has made the situation worse by bestowing power to local assemblies, which opened doors all sorts of misappropriations, including through various means of corruption.

In an equally compelling paper, Peters (2006) provides a chronological view of rural income and poverty in Malawi since the 1980s. Part of the debate focuses on the International Monetary Fund (IMF) and World Bank’s structural adjustment loans that hindered the prospect for farmers in rural areas to succeed after Malawi gained independence. However, 1994 onwards, Malawi and the World Bank in collaboration adopted alternative strategies that led to increases in economic growth. However, as every year passed by, corruption and neglect of smallholder farmers led to a decline in economic growth in Malawi.

III. Empirical Background

III.1. Malawi’s Economic Performance

As shown in Figure 1, GDP per capita in constant 2005 international dollar, experiences a rather disappointing trend for Malawi compared to that of the whole Sub Saharan Africa region (SSF), which is not much better but at least shows more significant improvements in the last ten years. In 1980, the average income per Malawian stood at just above $600. In 2009, we find that Malawi’s per capita GDP only increased to just above $700. The region’s GDP per capita has always been above that of Malawi and the gap between Malawi and the region has become bigger and bigger. While Malawi’s GDP per capita was 38.7 percent of the region’s GDP per capita in 1980, by 2009, Malawi’s GDP per capita was 36.7 percent of the region’s GDP per capita.

Figure 1: GDP per Capita (in constant 2005 international $), Malawi vs. SSF

Source: Created by author based on World Bank (2011) World Development Indicators (as posted on the World Bank website; downloaded on June 7, 2011).

Clearly, Malawi has struggled to increase its income per capita. Based on the US$700 income per capita income, an average Malawian will earn very close to $2-a-day, and that is still an
overestimation of what the majority of Malawians earn due to some rich Malawian pushing up the average. Indeed, based on the latest poverty headcount data available, 90.5 percent of the Malawian people lived below $2-a-day in 2004, and 73.9 percent of the Malawian population lived below $1.25 in 2004. These high poverty headcount ratios explain why Malawi remains to be one of the poorest countries in the world if measuring poverty by GDP per capita.

Figure 2: GDP Growth Rates, Malawi vs. SSF

Source: Created by author based on World Bank (2011) World Development Indicators (as posted on the World Bank website; downloaded on June 7, 2011).

Looking at Figure 2, we can see that Malawi’s annual GDP growth rates have been extremely volatile, surpassing once 17 percent and twice nearly 10 percent, while they also surpassed once negative 10 percent and three times negative 5 percent (mostly due to weather-related disasters like the droughts as well as floods devastating the lives of millions of people across Malawi). Comparing Malawi’s GDP growth rates with that of SSF, they are despite more volatile in Malawi on average comparable to that of SSF. So the reason for Malawi’s divergence from SSF in terms of income per capita is largely due to the fact that Malawi started out so much lower and that Malawi also had a slightly higher fertility than SSF, which lowers the benefits from GDP growth per person.

The increasing trend in Malawi’s GDP growth since 2002 (which manage to surpass the regional average) maybe a reflection of the change of leadership from Mr. Bakili Muluzi to Mr. Bingu wa Mutharika in 2004. Moreover, one possible explanation for improvements experienced in Malawi’s annual GDP growth rates may result from the introduction of the Malawi Growth and Development Strategy in 2006. The strategy identifies six key areas that define the direction the country intends to take between 2006/2007 and 2011/2012 fiscal years. The six key areas that are critical for immediate improvement are: agriculture and food security; irrigation and water development; transport infrastructure development; energy generation and supply; integrated rural development; prevention and management of nutrition disorders and HIV/AIDS.

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III.1. Malawi’s Progress with Social Development

The southern African region is regarded as the most highly affected region by HIV/AIDS. With high prevalence rates across the region, life expectancy is a crucial indicator that has been affected with the continued deaths of HIV/AIDS infected individuals. In 2008, 1.9 million adults and children in Sub-Saharan Africa were newly infected and 1.4 million died (UNAIDS, 2008). Moreover, about two-thirds of all people infected with HIV (22.4 million) live in this region, which is home to about one-tenth of the global population. AIDS is likely to remain the leading cause of death in Sub-Saharan Africa for the next several decades (Chin, 2007). Given this situation, the regional life expectancy is under threat from improving.

Despite the high prevalence of HIV/AIDS in the region as well as in Malawi, life expectancy in Malawi has experienced a significant improvement until the mid-1990s and then again more recently, see Figure 3. While the average life expectancy of a person in Malawi was about 45 years in 1980, the average Malawian born in 2009 can expect to live approximately 54 years. While Malawi had a lower life expectancy than SSF for many decades, Malawi surpassed SSF’s life expectancy in 1992. It then rose relatively sharply in the subsequent years, until is started to decline in 1997, due to the far higher HIV/AIDS prevalence in Malawi than in the average SSF country. It even dropped below that of SSF during 2003-2005, after which it recovered and is now about 2 years higher than for the average SSF country. This is a striking achievement for a nation being classed as one of the income-poorest countries in the world.

Figure 3: Total Life Expectancy at Birth, Malawi vs. SSF

Source: Created by author based on World Bank (2011) *World Development Indicators* (as posted on the World Bank website; downloaded on June 7, 2011).

Figure 4 shows the infant mortality rates of Malawi and the average SSF country. Here too, despite far higher infant mortality rates in Malawi than in SSF in the early 1980s, Malawi reduced its rate below that of SSF by 2005. Today, 69 infants die out of 1000 live births in Malawi, while in SSF slightly more than 80 infants die out of 1000 live births. This achievement

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3 Based on UNAIDS (2008), almost 12 percent of Malawi’s population is infected with HIV/AIDS.
for Malawi is even more striking than Malawi’s life expectancy, keeping in mind how far behind Malawi was in 1980 compared to the average SSF country and keeping in mind that HIV/AIDS has become a major source for maternal deaths in Malawi (more than in SSF), which leaves many children motherless each year and that these children are ten times more likely to die within 2 years of their mothers’ death.  

Figure 4: Infant Mortality Rate (per 1000 live births), Malawi vs. SSF

Source: Created by author based on World Bank (2011) *World Development Indicators* (as posted on the World Bank website; downloaded on June 7, 2011).

IV. Some Possible Explanations for Malawi’s Development Puzzle

While the full explanation for Malawi’s development puzzle is complex, there are some government policy interventions that contributed to Malawi’s social progress and some other government policy interventions that discouraged economic growth. Here, we look at investing in immunization, access to safe water and sanitation, corruption and protectionism.

IV.1. Investing in Immunization

In the previous section, we found that infant mortality rates in Malawi declined by more than half from 150 per 1,000 live births in 1980 to 69 per 1,000 live births in 2009. Consistent with the decline in infant mortality, Figure 5 shows that Malawi’s immunization rates against diphtheria, pertussis (whooping cough) and tetanus (commonly known as DPT) grew from 58 percent in 1980 to 93 percent in 2009. Though Figure 5 shows a high volatility in Malawi’s immunization rates, the more important point is that Malawi’s immunization rates were consistently above those of SSF throughout the last 30 years. Given that no reliable data is available for either Malawi or SSF before 1980, we cannot say if Malawi’s immunization rates were below that of SSF during the 1960s, but what is clear is Malawi has paid much more attention to immunization against DPT then SSF and has nearly reached universal coverage. The same applies to immunization rates against measles, which increased from 49 percent in 1980 to

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92 percent in 2009 in Malawi, while the immunization rates against measles reached only 68 percent in SSF in 2009.5

**Figure 5: DPT Immunization Rates, Malawi vs. SSF**

![Graph showing DPT Immunization Rates, Malawi vs. SSF]

Source: Created by author based on World Bank (2011) *World Development Indicators* (as posted on the World Bank website; downloaded on June 7, 2011).

Munthali (2007) notes that the Ministry of Health has been by far the largest supplier of vaccinations in the country. Furthermore Munthali also records that vaccines are delivered to rural areas through outreach clinics established by the Ministry of Health. Overall, support from various donors and civil society has ensured that Malawi continues to make significant progress in providing vaccinations to children nationwide.

### IV.2. Improving Access to Safe Water and Sanitation

Like elsewhere, access to clean water has been a key factor in reducing the prevalence of diseases such as diarrhea and cholera in Malawi. Roberts et al. (2001) conducted a study in a refugee camp in Malawi whereby covered water containers were used to store drinking water. Before that, the refugee camp had several repeated outbreaks of diarrhea and cholera due to contamination of the storage facility. The findings of the study indicated that household contamination of drinking water contributed to the outbreak of diarrhea and cholera.

The findings of Roberts et al. (2001) signify the importance of clean water and how it contributes to health. Having improved access to contamination free water and safe storage facilities are paramount to preventing water borne diseases. Therefore, having access to clean water requires complimentary support of a safe water storage facility in order to be completely successful. Furthermore, Roberts et al. (2001) also found that a proper method of chlorination was safer than using water containers. However, water containers were the more widely used method than chlorination.

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5 World Bank (2011).
Figure 6 shows the progress Malawi and SSF made with providing access to improved water sources. In 1990, 40 percent of the Malawian population had access to an improved water source. Eighteen years on, a staggering 80 percent have access to safe water. In contrast to Malawi, progress in improving the access to an improved water source in SSF has been relatively slow. In 1990, the SSF region had far higher access rates than Malawi: almost 50 percent of the SSF population had access to safe water (10 percentage points more). Yet, after only 5 years (in 1995), Malawi had basically caught up with SSF and today, the SSF region has only managed to spread access of an improved water source to just below 60 percent.

Malawi’s doubling of the percentage of population with access to safe water in only 18 years is due to the development of hundreds, if not thousands, of wells and boreholes nationwide through development organizations, both non-governmental and governmental. Moreover, the recorded progress in access to an improved water source and the use of covered containers to store water can be strongly correlated to the improvements Malawi has experienced in life expectancy and infant mortality.

![Figure 6: Access to Safe Water, Malawi vs. SSF](image)

Source: Created by author based on World Bank (2011) *World Development Indicators* (as posted on the World Bank website; downloaded on June 7, 2011).

**IV.3. Improving Access to Sanitation**

In addition to access to safe water, access to improved sanitation facilities is usually considered equally crucial to combat diseases. Good sanitation facilities and improved access to water protect from pathogenic bacteria and viruses that trigger diseases such as diarrhea. Montgomery and Elimelech (2007) report that, the global figures that describe the lack of water and sanitation facilities are alarming. An estimated 2.6 billion people live without improved sanitation services. According to Montgomery and Elimelech, having a connection to a public sewer or septic system or making use of ventilated pit latrines qualifies as improved access to sanitation services. As Montgomery and Elimelech (2007, p. 23) also note that “clean water and sanitation are essential elements in achieving a basic standard of health for the globe.”
Figure 7 presents a stark contrast in access to improved sanitation between Malawi and the SSF region. In 1990, the percentage of population with access to improved sanitation services stood at about 43 percent, which increased to 56 percent by 2008. In contrast, the SSF region in 1990 had a mere 27 percent with access to improved sanitation services and by 2008, SSF managed to improve access to sanitation by only 3 percent. Clearly, Malawi’s progress in providing access to safe water and sanitation is one key factor for Malawi’s progress with regards of increasing life expectancy and reducing infant mortality.

Figure 7: percent of population with access to improved sanitation facilities: Malawi vs. SSF

Source: Created by author based on World Bank (2011) World Development Indicators (as posted on the World Bank website; downloaded on June 7, 2011).


Stephanie Hanson (2009) considers SSF to be one of the most corrupt regions in the world. According to the Transparency International’s Corruption Perception Index (CPI), out of the ten most corrupt nations in the world in 2010, six are in SSF. Furthermore, Transparency International (2010) reports that about three quarters of the countries score below five on the corruption perception index. A score below 5 and moving towards zero indicates high corruption. However, a score above five and moving toward 9 indicates a much cleaner and less corrupt environment.

In Africa, corruption ranges from high profile political grafts to small-scale bribery of police and government officials. Hanson (2009) reports that in 2002, an African Union study found that corruption costs the SSF region $150 billion each year. Considering the fact that many nations in the region depend on foreign aid, the loss of such a large sum each year due to corruption, implies a significant loss of development and growth Moreover, Hanson (2009) finds that the cost of doing business increases, foreign direct investment is less attractive and in some regions, and corruption even fuels unrest.
However, in recent years, local governments and foreign donors have stepped up their fight against corruption and transparency. Local governments, like in Malawi, have initiated long lasting publicity campaigns with regards to corruption in order to raise awareness of the malpractice. Moreover, Malawi has also implemented a benefits package for individuals who report corrupt practices that lead to the prosecution of perpetrators. In addition, foreign donors analyze the level of transparency, corruption, human rights and freedom in a nation before releasing funds.

### Table 1: 2010 Corruption Perception Index for Sub Saharan Africa

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<tr>
<th>Rank</th>
<th>Regional Rank</th>
<th>Country / Territory</th>
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<tr>
<td>33</td>
<td>1</td>
<td>Botswana</td>
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<td>Cape Verde</td>
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<td>6</td>
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<td>Democratic Republic of the Congo</td>
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<td>47</td>
<td>Somalia</td>
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Table 1 comprises the 47 nations of Sub-Saharan Africa (SSA) included in the 2010 CPI. CPI scores vary from as high as 5.8 in Botswana and as low as 1.1 in Somalia. Malawi ranks 10th in
the region and 85th in the world, despite high profile cases of corruption, involving former presidents and members in the top of the government hierarchy.

Taking into account that Malawi has very few natural resources, this explains partly why Malawi has failed to attract foreign investment. Like many others, Jensen (2003) acknowledges the importance of foreign direct investment (FDI) in today’s global economy. FDI is an engine of employment, technical progress, productivity improvement and ultimately, economic growth. On the other hand, Jensen (2003) points out that governments are pressured to provide a more hospitable climate to foreign multinationals. On many occasions, domestic policy need be altered and at times the de-facto sovereignty of the nation state and democratic governance too.

Malawi may rank the 10th least corrupt nation in the region; however, protectionist policies prevalent in the current Mutharika administration hinder further economic growth and development in the nation. For example, the current administration’s stance on stringent conditions for agricultural corporations and the setting of minimum prices have sent a bad signal to foreign investors. In late 2009, the Chief Executive Officer of Malawi’s largest tobacco exporting firm (Alliance One Inc.) was deported over allegations of buying tobacco at the Lilongwe auction floors for a price below the minimum.6 Regarding such controversial matters, commentators believe that the authoritarian rule being adopted by the current leader, Mr. Bingu wa Mutharika, hinders the country’s credibility and attractiveness as a lucrative investment destination.7

The current government has on many occasions stressed the importance to empower indigenous Malawians. Given that Malawi is predominately an agricultural based net importer, Malawi faces tough challenges in transitioning into a manufacturing based net exporter. Moreover, fierce competition from the likes of Zambia and Mozambique further place Malawi in a difficult position in the region.

V. Conclusion

“It’s up to us. We can choose to shift the responsibility, or, as the professor proposes here, we can choose to shift the paradigm.”8

Malawi has certainly lagged behind in improving average per capita income despite enjoying periods of significant economic growth. Nevertheless, indicators pertaining to individual health and access to basic resources have experienced significant improvements since the 1980s. As Bono mentions, the international community can either choose to shift the responsibility or model used, to assist developing countries in order to bear improvements in a nation like Malawi.

It comes as a surprise that despite having one of the world’s lowest per capita incomes, Malawi has seen such improvement in individuals’ health and access to basic resources. However, international aid, both from foreign governments and non-governmental organizations have contributed immensely to improving individual health and access to resources. Moreover, with continued coordination between supranational institutions such as, the United Nations and World

6 Jomo (2009).
7 On the other hand, Sachs (2012) gave credit to the late President Bingu wa Mutharika for having engineered an agriculture-led boom in Malawi, one that pointed a way for Africa to overcome its chronic hunger, food insecurity, and periodic extreme famines.
Bank, and the Malawi government, development projects in rural areas across Malawi have been key to yielding such impressive results since the 1980s. Life expectancy, infant mortality, immunization rates (DPT), access to an improved water source and access to improved sanitation facilities all outperform the SSF average when compared.

Despite improvements in health, access to basic resources and corruption, income per capita has remained almost stagnant since the 1980s. Malawi ranks the 10th least corrupt nation in SSF and government policies seem to be a hindrance in achieving growth related to per capita income. Protectionist policies instigate fear amongst foreign investors, deterring much needed investment Malawi requires thus, the economy fails to create jobs and progress in raising per capita income.

A more open, diplomatic and welcoming government can be a starting point in order to woo foreign investors. Furthermore, developing institutions that are responsible for coordinating issues pertaining to education, business activity and security can boost investor confidence and promote Malawi as a nation foreigners can invest, without facing persecution or living in fear due to the lack of enforcement of property rights, which Malawi has set up well already. Despite having a well-coordinated institution, which deals well with enforcing property rights, the core target area for improvements lie in rural Malawi. By expanding health and education facilities across Malawi, you build a nation rich with skilled human capital. Given good government policies, this can attract large foreign investments to Malawi. With at least a job, you can hope to see a rise in per capita income.

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Impact of Climate Change on the Poor in Bolivia

Christian Winters

Abstract

Bolivia is one of the poorest countries in South America and as a result is particularly vulnerable to climate change, which poses a threat to both the urban and rural poor. The changing weather patterns and rapid melting of glaciers in the Andes can cause both drought and flooding. That in turn will have an adverse impact on agriculture and the livelihoods of the poor. The economically vulnerable will suffer the most because of their limited ability to adapt. This article will examine the impacts of climate change in detail and will explore some of the options currently available to mitigate those impacts.

I. Introduction

In the heart of South America sits Bolivia, nestled between the soaring peaks of the Andes (on its west) and the Amazonian jungle (on its east). Given this location, Bolivia has a diverse geography with varied climates. It is the people in these diversities that are facing the specter of climate change in ways that not many would expect. In contradistinction with the trend of rising temperatures in the rest of the world, Bolivia’s overall temperatures have dropped, especially in the highlands. Bolivia’s changing climate is also characterized by unexpected impacts mainly on reduced cloud cover and precipitation in the highlands.

It is the effect of climate change on people, specifically Bolivia’s poor and indigent, which is of capital concern. Any sudden change in the quantity of a given resource has an economic cost. Infrastructure must be rearranged to accommodate changes. The economic cost is undeniable. That the poor are inordinately affected by increasing scarcity cannot be denied either. Indeed, climate change in Bolivia has led to glacial melt, droughts, floods, forest fires, erosion, and many other ills that have plagued the poorest people the most. It has damaged Bolivia’s economy and created many problems for the poor in both rural and urban areas.

This article examines the effects of climate change on Bolivia’s poor. Following this introduction, the next section will provide an overview of the literature specific to climate change and its economic impact in Bolivia. Section III will provide some empirical background
on Bolivia’s economy, carbon dioxide emissions, geology and climate. Section IV will then
discuss in more details how climate change affects poverty in Bolivia. The final section offers a
summary of the issues Bolivia faces and some options to mitigate problems in the future.

II. Literature Review
Given the severity of the climate change implications on Bolivia’s poor, there has been a
growing literature in the last few years.

- The most in depth research specifically on the impact of climate change on Bolivia’s poor
  has been provided in a 2009 World Bank Policy Research Working Paper written by
  Lykke Andersen (who is working at the Institute for Advanced Development Studies in
  La Paz, Bolivia) and Dorte Verner (who is working at the World Bank in Washington,
  DC). Their paper, entitled “Social Impacts of Climate Change in Bolivia: A Municipal
  Level Analysis of the Effects of Recent Climate Change on Life Expectancy,
  Consumption, Poverty and Inequality” is an invaluable asset.
- A second main source is a paper by Greg O’Hare and Sara Rivas (20007), which
  clarifies the distinction between climate change in urban and rural areas and explains how these
  differences will affect the poor.
- Another major source is a report by Oxfam International (2009), which explains specific
  aspects of climate change on the environment and the people within those environments.
- There also are various other reports that touch on the subject but in a less comprehensive
  Weinberg’s (2010) review article offer insights into the specific though important topic of
  water supply and glacial melt in Bolivia. Both were written to look not only at the loss of
  glaciers from an environmental perspective but also at the effect on people affected.
- Finally, the Inter-American Development Bank’s (2011) country strategy for 2011-2015
  provides helpful background on Bolivia’s current economic situation and also contains a
  section specifically on the situation of Bolivia’s climate.

There are few disagreements among researchers on the impact climate change has had and will
have in Bolivia. The consensus is that temperatures overall in Bolivia have fallen and this is due
mostly to falling temperatures in higher altitude regions that offset increases in temperatures seen
in lower regions. There is also no dissent that the impact of climate change on the poor is
negative.

III. Empirical Background

III.1. Bolivia’s Economy
Bolivia is one of the poorest countries in Latin America and the poorest in South America. Its
gross domestic product (GDP) in 2009 was $17 billion and its GDP per capita was $1,758.
Income has increased dramatically over the past 50 years in both the national level as well as per
capita (see Figure 1 and Figure 2). However, taking inflation and differences in purchasing
power parity (PPP) into account, Bolivia’s GDP per capita increased far less, from $3,604 in
1980 to only $4,013 in 2009. Furthermore, in 2007, roughly a quarter of the population (24.7
percent) lived under PPP-$2 a day and 14 percent lived below PPP-$1.25 (which is the latest
available data for Bolivia’s poverty headcounts). In 2010, Bolivia’s population was with 9.86 million just shy of ten million, of which 59 percent were between the ages of 15 and 65.¹

**Figure 1: GDP in current U.S. dollar, 1961-2009**

Source: Created by author based on World Bank (2011) *World Development Indicators* (as posted on the World Bank website; downloaded on June 7, 2011).

**Figure 2: GDP per capita in current U.S. dollar, 1961-2009**

Source: Created by author based on World Bank (2011) *World Development Indicators* (as posted on the World Bank website; downloaded on June 7, 2011).

It is imperative to understand the distribution of the poor and the reasons for their poverty before attempting to understand the impacts of climate change. As of 2010, 34 percent of Bolivia’s

¹ World Bank (2011).
people live in rural communities (which is a drastic decrease compared to the 63 percent living in rural communities in 1960). Still, it remains to be true that poverty in Bolivia is most significant in rural areas. In rural areas, the poverty rate was 77 percent on average in 2007, meaning that roughly a quarter of Bolivia’s people are rural poor. This fact is important because climate change affects the poor in different ways in rural areas and in cities. Urban areas comprise 66 percent of the Bolivian population of which 50 percent are poor (in 2007), meaning that the urban poor amount to one third of Bolivia’s population and around 60 percent of the country lives in poverty.²

The rural areas are spread out among Bolivia’s different geographic regions. “Of the poor rural population, 31 percent live on the altiplano where the most intense poverty is found, 47 percent live in the high-Andean valleys (of the altiplano) and the remaining 22 percent live in the lowlands of eastern Bolivia and Chaco.”³ The “extreme poverty and destitution are quantitatively worse in the rural areas (1.8 million) than in the cities (1.6 million).”⁴

III.2. Bolivia’s Carbon Dioxide Emissions

Bolivia is not a large contributor of global emissions and therefore climate change. “In 2004 Bolivia was responsible for just 0.04 per cent of world emissions of greenhouse gases.”⁵ However, the amount of emissions does increase when changes in land use such as deforestation are added in. “If these emissions are included, in 2000 Bolivia was responsible for 0.35 per cent of world GHG emissions… by either measurement, Bolivia is one of the countries least responsible for global warming. Yet it is one of the most exposed to its effects.”⁶

![Figure 3: CO₂ Emissions, 1961-2007 (in thousands of tons)](source: Created by author based on World Bank (2011) World Development Indicators (as posted on the World Bank website; downloaded on June 7, 2011).)

² World Bank (2011).
⁴ O’Hare and Rivas (2007), p. 323.
Furthermore, Bolivia’s carbon dioxide emissions have grown over time, largely following the global trend and reflecting fluctuations in Bolivia’s GDP (see Figure 3). Bolivia is inordinately impacted by climate change despite not being a large contributor to it. Unfortunately Bolivia will have to suffer the consequences for a mistake that others have made. But just what those consequences will be remains to be seen.

III.3. Bolivia’s Geology and Climate

To understand the impact of climate change on Bolivia it is first necessary to understand Bolivia’s geology and current climate. “Although Bolivia is located entirely within the tropics, the large altitude variations within the country imply that it has almost every conceivable type of climate ranging from Andean glaciers, via salt deserts, to steaming rainforest.”7 O’Hare and Rivas (2007) suggest that the country can be divided into three distinct regions by altitude: “(1) the Andes (4,000–6,000 m) with their cold elevated mountains, valleys and interior plains, e.g. the altiplano at 3,000–4,000 m; (2) the extensive eastern lowlands lying below 1,000 m and covered in lowland moist tropical forest, although large tract have been cleared especially in the west; (3) the smaller central valley (1,000–3,000 m) between the Andean highlands and the eastern tropical lowlands with a cooler and less humid climate.”8

These differences are important to note because as will explained in more details in section IV, the effects of climate change on poverty changes drastically depending on the conditions in each region. In this article, only the first two larger areas mentioned by O’Hare and Rivas (2007) will be observed because the central valley is a grey area when it comes to judging climate change impacts. Bolivia’s heterogeneous geology impacts its climate heavily. As O’Hare and Rivas (2007) note the temperatures differ heavily depending on the altitude.

Climate change will have very disparate effects on different regions of the country. “The patterns of warming/cooling show a distinct geographical distribution, with the highland stations in the southwestern part of Bolivia showing consistent cooling, and the lowland areas to the north and east showing slight warming (…). This is consistent with data from neighboring countries, which show cooling in many parts of Peru and Chile but warming in Brazil.”9

Oddly enough climate changed overall has not led to an increase in temperatures in Bolivia. The temperature in the lowlands has increased to a degree but this is offset by a decrease in temperatures in the highlands.10 This however does not mean that climate change hasn’t had a negative impact. Glaciers for example have still been melting rapidly which has a cost that will be explained later. Andersen and Verner (2009) note the reasons for the seeming inconsistency of glacial melting despite cooler temperatures:

“First of all, the glaciers have been melting continuously since the Little Ice Age (about 1550 to 1850), with only a brief slowdown during the relatively cool period of 1950-1980, and it is normal for melting to accelerate towards the end (just like a small ice cube melts faster than a big ice cube).… The reduction in precipitation is likely associated with the general reduction in cloud cover over the tropics since measurements began in the early 1980s, and less clouds means more intense solar irradiation, which accelerates

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8 O’Hare and Rivas (2007), pp. 310-311.
10 Andersen and Verner (2009), p. 11.
Glacial melt arises from a far more rapid decline toward the end of a glaciers time and is compounded by decreased cloud cover caused by climate change.

The change in Bolivia’s climate can be summarized as a decrease in overall temperatures in Bolivia due to lower temperatures in the Andes and an increase in temperatures in the lower areas. Glacial melt in the Andes is still occurring rapidly despite overall higher temperatures and this is due to reduced cloud cover as a result of climate change.

IV. Discussion

Climate change will impact the poor in various ways because of the demographic distribution across different geographic regions. Andersen and Verner (2009) suggest that as a general rule in each region “warm and wet is good, while cold and dry is bad for human development.” It is difficult to enumerate every different way that climate change will affect the poor. Categorizing them is therefore also a difficult task but the main points highlighted by researchers will be discussed herein.

IV.1. Increase in Natural Disasters

Climate change has increased the amount of natural disasters Bolivia has seen. Natural disasters inordinately impact the poor because they have less ability to react to them and tend to live in more hostile environments than the wealthy do. The charity Oxfam points out that “Bolivia experiences a wide variety of ‘natural’ disasters. These include drought in Chaco, flooding in the Amazon and ferocious hailstorms in the highlands. In 2007 — for the first time — Bolivia was among the top ten countries most affected by disasters. In 2007 and 2008 it faced the worst emergencies of the past 25 years.” Oxfam International (2009, p. 20) points out several revealing statistics on the subject:

- The period from 2001 to 2004 saw the highest number of emergencies declared in the last 70 years (see Figure 4).
- In the period from 1997-2007, flooding was the most common extreme weather event, followed by landslides, epidemics and droughts. Around 420,000 Bolivians were affected by flooding over this ten-year period.
- The three years of 2006-2008 have been even worse, with regular flooding, rivers overflowing, landslides, hail and frost. The numbers of women and men affected were very large: 560,000 in 2006/7 and 618,000 in 2007/8, the equivalent of approximately 6 per cent of the country’s population.
- In 2006/7, the total cost (direct and indirect) was estimated at US$443 million, and in 2007/8 at US$547 million — the equivalent of 3 to 4 percent of Bolivia’s annual GDP, a huge sum of money for a poor country.

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11 Andersen and Verner (2009), p. 11.
It goes without saying that natural disasters cause deaths and injuries and that poorer areas are affected more. As Oxfam International (2009, p. 17) has pointed out: “Those living in rural areas are very likely to be the ones even more exposed to the more frequent and more extreme weather events.”

**Figure 4: Emergency Situations Declared by the Bolivian Government, 1930-2004**

[Image of a bar chart showing emergency situations declared by the Bolivian Government from 1930 to 2004]

Source: Oxfam International (2009), Box 2-1, p. 20.

### IV.2. Impact of Climate Change on Forests

When coupled with deforestation, climate change can have a harsh impact on the environment. The two in conjunction can cause rapid degradation of land through increased erosion. This is particularly true for Bolivia in the Amazon. As stated by Oxfam International (2009, p. 10), since 1990, deforestation has been increasing to currently about 300,000 hectares per year and in addition to adding to greenhouse gas emissions, this “also increases the devastation caused by flooding as natural forms of protection have been removed.”

The impact of deforestation on the poor coupled with climate change is not very clear. It is important to note that most of the land that has been deforested has been used for agricultural production, mainly of soya or for grazing, but whether or not the adverse effects of flooding and erosion outweigh the benefits of larger areas of agricultural production remain to be seen.

Climate change also has been considered the cause of an increase in the amount of forest fires. In 2005, 500,000 hectares of forest burned down because of uncontrolled fires during a time of drought. “The Vaca Diez province of Beni suffered one of the worst forest fires in its history, which in just 15 days consumed 100,000 hectares of forest.”

This was during one of the worst droughts in the Amazon has ever seen caused by higher sea surface temperatures in the North Atlantic. Furthermore, “the presence of longer dry periods [....] combined with changing

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characteristics in the forested areas (dry species of ecosystems which can easily catch fire) and populated zones will increase the conditions for a larger number of forest fires in the future”.

When climate change is coupled with deforestation and changing natural habitats the result is environmental degradation such as erosion and forest fires. These both adversely affect the poor. Moreover, it is important to note that both conditions release carbon dioxide into the air resulting in a vicious cycle where climate change causes environmental degradation which in turn causes more climate change. For the poor of Bolivia it is necessary to break this cycle through more regulation and protection of the environment.

IV.3. Damage to Agriculture

In 2008, Bolivia’s agricultural land comprised 34 percent of the whole country. Rural areas can be extremely susceptible to climate change because unexpected extremes cause a lack of security. “Bolivians do considerably better in hot areas than in cold areas, even when controlling for other factors such as education attainment and urbanization levels. Inhabitants in the hottest regions are able to consume almost twice as much as inhabitants in the coldest regions.” On the face of it then one would think that warmer temperatures would be good for the country. The problem is that changes especially rapid changes come with a cost.

In warmer areas that cost has been an increase in various new ills that damage agriculture, which as noted before is what many of the poor rely on. “In the last few years, Bolivian lives have also been buffeted by an almost biblical array of extreme weather events, many of which scientists believe are probably linked to climate change. This year brought scorching temperatures and intense sun. A drought killed 7,000 farm animals and sickened nearly 100,000.” In addition, “[s]evere storms normally associated with El Nino periods, every seventh year, now occur regularly. Warmer temperatures mean new crop pests -- crickets and worms -- as well as diseases like malaria and dengue fever.”

In regions that are now colder the adverse change has been more extreme weather that will be the main economic cost of climate change. “The colder winters in the already cold highlands could potentially have an adverse effect on the predominantly poor and indigenous population who inhabit the Bolivian highlands, since one of their main worries and limitations on agricultural productivity is frost”.

The colder winters in the Andes will indubitably adversely affect the poor.

IV.4. Glacial Melt and Water Supply

Another problem of climate change is the impact it has on water supply. This impacts urban areas more than rural areas because demand is increasing due to a high birthrate and immigration from rural areas to cities meaning all while supply is decreasing. Weinberg (2010) notes that the country will likely soon face dire water shortages. He reports that:

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16 Andersen and Verner (2009), p. 8
• in 2009, the 18,000-year-old Chacaltaya glacier overlooking La Paz (Bolivia’s capital) vanished, threatening water supplies to the Bolivian capital; 
• in the same year, water levels in Lake Titicaca (which some 2.6 million people depend upon) dropped 2.6 feet, reaching its lowest level since 1949; and 
• in recent years, the rainy season in the Altiplano (which is the arid tableland near La Paz) has contracted from six to three months in recent years, prompting water rationing in some Altiplano towns and cities.

The rapid decline in glaciers is attributed to climate change by most scientists meaning that climate change has caused yet another burden on the poor of Bolivia.20 Both rural and urban areas will be affected. “Irrigation schemes are used in only 10 per cent of Bolivia’s cultivated land (…). The remaining 90 per cent depends on a regular supply from precipitation, underground aquifers and glaciers.”21 That is to say that the vast majority of rural farms depend on supplies of water that will be reduced as a result of climate change.

Urban areas also suffer because demand for water is higher where populations are more concentrated. In addition, as pointed out in the Inter-American Development Bank (IDB) (2011) report, the burgeoning urbanization process will mean greater demand for water in the country’s urban areas. It is estimated that by 2050, the demand for water for irrigation and industrial purposes will increase by 150 percent and 250 percent, respectively.

IV.5. Damage to the Economy as a Whole

The increases in demand for water, coupled with the rapid degradation of the water supply, will certainly have economic consequences. Forty percent of Bolivia’s electricity comes from hydroelectric dams that run on water from glacial melt and precipitation.22 A lack of water in cities could disincentivize urbanization meaning that the rural poor would stay. The problem with this is that urban settings offer more opportunities such as education and more skilled labor. More people with more human capital are better for the economy as a whole so water shortages can have enormous consequences.

The method to gauge the cost of climate change on an economy is to see the direct impact it has on the economy as a whole. Economists agree that when the economy as a whole is well off, the poor are better off than if it is not. Andersen and Verner (2009) note “at the national level, the model estimates that climate change during the last 50 years has caused a reduction in consumption of about 1.3 percent.”23 This suggests that climate change has a direct impact on GDP because it has reduced Bolivia’s purchasing power. That is to say that the Bolivian economy would be larger were it not for climate change. Clearly, the economy of the country as a whole has suffered from climate change

Andersen and Verner (2009) also point out that there is a “statistically significant positive relationship (ρ = 0.28) between initial level of consumption and the estimated effects of past climate change. This suggests that it is generally the poorest municipalities which have

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experienced the most negative effects of recent climate change, implying that recent climate change has contributed to an increase in both poverty and inequality.”

V. Conclusion

Bolivia faces many challenges in dealing with climate change and its many impacts. Mostly they involve adjusting to the inevitable changes from natural disasters to glacial melt, forest problems, agricultural degradation and overall damage to the economy that will occur. Bolivia’s GDP has been negatively affected, the poor have become poorer, and inequality has risen. The quality of life of poor Bolivians has decreased and that decrease has been caused by something the poor themselves have a little part in and no control over: climate change.

Bolivia has also in recent times become an outspoken nation on the topic. Evo Morales, the current president, spearheaded a movement in the United Nations to proclaim April 22nd Mother Earth Day, saying “We are strangling the planet, strangling ourselves.” He might be speaking from Bolivia’s experience as climate change there has become a stranglehold indeed.

Bolivia is left with the burden of attempting to seize control of a situation that it is the least complicit in. Bolivia has a duty to itself to overcome the problem of climate change but the rich countries that caused most of climate change have an even bigger duty to Bolivia. These countries should provide aid to Bolivia to relieve some of the ills they have caused. It is a travesty indeed that one of the world poorest countries has been left with a problem caused by the world’s richest ones. Climate change is rightfully seen as a tragedy of the commons however the impacts to all are unequal in this instance because Bolivia bears a greater burden. In this poor country the impoverished will be most affected.

The most obvious solution to the problem is to focus on environmental regulation and programs to reduce poverty. These are very obvious solutions but they are all the more germane given that the problems associated with climate change have been revealed. “One of the reasons why it is so important to reduce the numbers living in poverty in the longer-term is that poor men and women are, and will be, the ones to bear the brunt of the climate change.” What the future holds remains to be seen. But unless something changes soon, the future for Bolivia looks bleak indeed.

References


24 Andersen and Verner (2009), p. 15.
25 As quoted in Balita (2009).


The Women of Thailand

Liza Romanow

Abstract

Thailand is a developing country located in Southeast Asia. Over the course of the past few decades, it has been going through various transformations. Previously, the country was known for its mistreatment of women. In the new constitution that was written in 1997, women were granted equality with men. However, despite the new legislation, discrimination is still present and apparent in the role women play in government, at home and at work. Women are highly under-represented, are mistreated at home and discriminated at work. Additionally, sex trafficking is still a prevalent problem among women and children. Sex trafficking became extremely prevalent in Thailand during the time of the Vietnam War and has remained a commercial industry ever since in Thailand. Despite some progress, Thailand has a long way to go before reaching gender equality.

I. Introduction

Thailand is a middle-income country in Southeast Asia that is located to the southeast of Myanmar, the southwest of Laos and the north of Cambodia. The country is historically known for its discrimination of women, as men play a dominant role in this culture. This discrimination is most prevalent in politics, at home, the work place. Thailand is also well-known for its high rate of human trafficking, mostly for prostitution. Women were granted equal rights for the first time in the 1997 constitution, which was reconfirmed in the 2007 constitution, however, stereotypes and prejudice against women are still wide spread.\(^1\) As of 2010, women represented only 13.3 percent of seats in Thailand’s national parliament.\(^2\) There is not a lot of oversight and enforcement of the equality clause in the constitution.

Still, compared to some decades ago, women are now a substantial part of the work place and nearly half of them attend college. The jobs they work and the wages they earn are however gender discriminated. Women are known to have jobs as nurses and teachers. In fact, they are banned from being in the police force or serving in the military. Men also exert their dominance over their wives in the household, and it is not uncommon for some abuse to be present.

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\(^1\) U.S. Department of State (2011) Background Note Thailand.
Additionally, prostitution, although illegalized in the new 2007 constitution, still remains widespread. It has been popular in the country at least since the early 1800s, and grew rapidly during the Vietnam War (1955-1975). Today, thousands of women remain trafficked in Thailand.\(^3\) Prostitution is considered to be an easy way to make money, and is a commercial industry for Thailand, with many foreigners coming to Thailand solely for that purpose.

This article reviews the situation of women in Thailand. Following this introduction and a brief review of the literature, the article provides some empirical background (section III) on the Thai population, the political system of Thailand, and the Thai economy. As of late, all three have been changing. Slowly, women are becoming more incorporated into society. This incorporation is examined in the subsequent four sections (IV-VII), reviewing, respectively, the changing status of Thai women with regards to health, education, politics and work. Section VIII provides some conclusions.

II. Brief Literature Review

There is a plethora of scholastic literature that has been published pertaining to women’s rights in Thailand. Since 1997 (which is when the first constitution was drafted by a popularly elected Constitutional Drafting Assembly), more has been written to explain the changes the country has been going through. Many scholars cover Thailand’s economic development, including the impact of the East Asian crisis in the mid-1990s. There is not too much information available on the lives of Thai women before the 1997 constitution. In recent years, scholars have produced some good articles on the recent transformation of women in Thai society. Many are on the subject of sex-trafficking, however there is also many on women’s growing role in the work force, and outside of the home. The following publications are some of the more recent publications covering a variety of topics related to women in Thailand.

- Amara Pongsapich (2006) wrote a book chapter entitled “Women’s Movements in the Globalizing World: The Case of Thailand” which provides valuable information on how Thai women are trying to increase their activism in politics. She explores how certain issues have made women interested in the political process, in particular, the environment and social movements.

- An article by Kanchana Tangchonlatip et al. (2006) provides detailed information on migration and gender-based occupational segregation in Bangkok. Tangchonlatip et al. (2006, p. 54) point out that the sex migration to Bangkok “became more pronounced in the decade after the launching of a new economic development approach of export-oriented growth, and females have been predominant in migration flow to Bangkok for several decades.” This “demand for female workers, especially young workers, was mainly due to their perceived desirable characteristics, which included being docile, non-aggressive, and being predisposed to factory work, on account of their nimble fingers and good eyesight.”\(^4\) While the occupational segregation has declined in some occupations, it is still a widespread phenomenon that contributes to women’s lower pay.


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\(^3\) U.S. Department of State (2011) *Background Note Thailand.*

\(^4\) Tangchonlatip et al. (2006), p. 72.
about women and how their roles are steadily improving within the work place. Especially the chapter by Natenapha Wailerdsak (2009) explores women CEOs and women in power who are now beginning to set an example for the rest of the country. She also provides some interesting statistics and case studies.

- The country profile for Thailand by the World Health Organization (WHO) (2005) on “Improving Maternal, Newborn and Child Health in the South-East Asia Region” provides detailed information on all of the initiatives undertaken to help prevent the mother and infant mortality in Thailand. It talks about preventative measures being taken against HIV/AIDS, as well as discusses the then recently reformed healthcare laws in Thailand.

- The 2007 report entitled “Stateless and Vulnerable Human Trafficking in Thailand” by the Washington, DC based non-profit organization Vital Voices Global Partnership does a nice job exploring the dangers of sex trafficking and its effects. It discusses why trafficking is such a big industry in Thailand and how the country has come to rely on it.

- One of the many news articles covering sex trafficking in Thailand is the one by Christine Gorman (2004), published in Time Magazine. It does an excellent job in explaining the sex trafficking problem in Thailand to the uninformed reader.

III. Empirical Background

III.1. Population

Thailand was supposedly founded in the 13th century, but according to the CIA (2011), recent studies show that some areas of the country were inhabited as early as 4000 BC. As shown in Figure 1, its total population nearly doubled from 37 million in 1970 to 68 million in 2009.

![Figure 1: Thailand’s Total Population, 1970-2009](image)

Source: Created by author based on World Bank (2011) World Development Indicators (as posted on the World Bank website; downloaded on June 7, 2011).

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Many of the Thai people are of Chinese origin. Buddhism is the most practiced religion, as that is how 94 percent of the people identify themselves. 6 Thai is the most common language spoken. Nearly everybody (92.6 percent of the population) is literate as public education is provided for free for at least nine years.7

The majority (66 percent) of the population resides in rural areas, though urbanization is proceeding slowly in Thailand (see Figure 2). As of 2009, 26.5 percent of the Thai population lived below $2-a-day, and 10.8 percent lived below $1-a-day. A major problem that this country faces is wealth disparity. There is a very wide gap between the upper and lower classes.

Figure 2: Percentages of Rural and Urban Population, 1970-2009

![Rural and urban population (%) of total population](image)

Source: Created by author based on World Bank (2011) World Development Indicators (as posted on the World Bank website; downloaded on June 7, 2011).

III.2. Political System

Thailand is a former constitutional democracy. In 1997, the government was overthrown and a constitutional monarchy was created. In turn, a new constitution was written.8 This constitution created a bicameral legislature and allowed for direct elections. Women and men alike are allowed to hold positions; however, as will be shown in more details below, women represent a small minority. After another coup, a new constitution was revised in 2007, according to which there is a King, a Prime Minister, a legislature, and a judicial system.

The legislature is divided into two houses, the House of Representatives and the Senate.9 Citizens are able to begin voting at the age of 18 years. In Thailand, there is a multi-party system, but communism is banned.10 The current Prime Minister is the Democratic Party leader

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6 U.S. Department of State (2011) Background Note Thailand.
8 U.S. Department of State (2011) Background Note Thailand.
10 U.S. Department of State (2011) Background Note Thailand.
Abhisit Vejjava, after the previous two Prime Ministers from the Pro-Thaksin People’s Party were thrown out.11

III.3. Economy

In terms of GDP per capita, Thailand is considerably richer than the average developing country in East Asia and the Pacific (see Figure 3). Figure 3 also shows that during the mid-1980s until the East Asian crisis in 1995, Thailand grew faster than the average developing country in East Asia and the Pacific. The East Asian crisis had a severe impact on Thailand. While Thailand continued to grow after the East Asian crisis was over, Thailand was once again severely impacted by the 2008 world economic and financial crisis as the economy is primarily based on exports (which make up nearly 70 percent of Thailand’s GDP).12 Tourism, another major economic sector, was affected as well. Stimulus packages are credited for reviving the government because there has been steady growth since they were passed.

![Figure 3: GDP per capita in PPP (constant 2005 international dollars), 1980-2009](image)

Source: Created by author based on World Bank (2011) World Development Indicators (as posted on the World Bank website; downloaded on June 7, 2011).

As shown in Figure 4, Thailand had made good progress with its structural transformation towards an industrialized country until 1993, when the share of agriculture in GDP reached a minimum of 8.7 percent. Since 1993, the structural transformation has basically come to an end. Today, the share of agriculture is higher in Thailand than in the average developing country in East Asia and the Pacific (see Figure 4). Based on Figure 5, there are no major gender differences in sectoral employment of women and men in agriculture, industry and services. The share of women working in agriculture is actually slightly smaller than the share of men working in agriculture, while the share of women working in the service sector is slightly above that of

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men. However, as will be shown below (in Section VII), there remain gender discriminations with regards to positions held and wages paid.

**Figure 4: Agriculture, value added (percent of GDP), 1970-2009**

Source: Created by author based on World Bank (2011) *World Development Indicators* (as posted on the World Bank website; downloaded on June 7, 2011).

**Figure 5: Sectoral Employment of Women and Men (percent), 1980-2007**

Source: Created by author based on World Bank (2011) *World Development Indicators* (as posted on the World Bank website; downloaded on June 7, 2011).

**IV. Health of Thai Women**

It is important for a country to look after the health of its citizens. In Thailand, increased efforts have been made in order to ensure 1) a long life and low maternal mortality, 2) protection from HIV/AIDS, and 3) education about birth control.
IV.1. Life Expectancy and Maternal Mortality

Consistent with global experiences, Thai women live on average longer than men. In 1980, Thai women lived about six years longer than Thai men. By 2009, the life expectancy for Thai women as well as men increased by about 3 years (from 69 years in 1980 to about 72 years in 2009 for Thai women; and from 63 years in 1980 to about 66 years in 2009 for Thai men). Hence, like in 1980, women lived about three years longer than men in 2009. However, as Figure 6 shows, the changes in life expectancy during the last 30 years have been different between Thai women and Thai men. Thai men experienced more volatility in changes of their life expectancy during the last 30 years than Thai women.

Furthermore, Figure 6 also shows that the average changes in Thailand’s life expectancy over the last 30 years are very different to the average changes in life expectancy of other developing countries in East Asia and Pacific. Despite complex changes in Thailand’s life expectancy over time, with some variations across gender, the most important observation from Figure 6 is that the life expectancy of other developing countries in East Asia and Pacific is now considerably higher than in Thailand.

- In 1980, Thai women lived about five years longer than women in other developing countries in East Asia and Pacific. In 2009, Thai women lived about two years less than women in other developing countries in East Asia and Pacific.
- In 1980, Thai men lived marginally longer (less than a year) than their counterparts in other developing countries in East Asia and Pacific. In 2009, Thai men lived about five years less than men in other developing countries in East Asia and Pacific.

To summarize, while there do not seem to be significant gender discriminations in Thailand’s life expectancy, both Thai women and Thai men have (on average) been overtaken in terms of life expectancy by the other developing countries in East Asia and Pacific.

Figure 6: Life Expectancy of Women and Men, 1980-2009

Source: Created by author based on World Bank (2011) World Development Indicators (as posted on the World Bank website; downloaded on June 7, 2011).
Even though women in other developing countries in East Asia and Pacific live now longer than Thai women, Thailand’s maternal mortality rate is still far lower than that of other developing countries in East Asia and Pacific.

- In 2000, Thailand’s maternal mortality rate was 63 deaths per 100,000 live births, while it was 130 deaths per 100,000 live births in other developing countries in East Asia and Pacific. Hence, in 2000, Thailand’s maternal mortality rate was less than half that of other developing countries in East Asia and Pacific.

- In 2008 (which is the latest available data), Thailand’s maternal mortality rate was 48 deaths per 100,000 live births, while it was 89 deaths per 100,000 live births in other developing countries in East Asia and Pacific. Hence, in 2008, Thailand’s maternal mortality rate was more than half that of other developing countries in East Asia and Pacific.

In other words, despite progress in reducing maternal mortality in both Thailand and other developing countries in East Asia and Pacific, the later have made more progress in absolute as well as in relative terms.

In any case, one of the main reasons for why maternal mortality has been lowered and women’s life expectancy has gone up in Thailand is because of increased attention paid to women’s health. For example, Thailand’s National Health Development Plans have been paying particular attention ensuring good health care for women. “Maternal and child health has been important and has continually been declared as a top priority since the 3rd National Health Development Plan (NHDP 1972-1976) and continues to be so in the present plan (9th NHDP, 2002-2006), which has set ambitious targets for maternal, newborn and child health.”

Figure 7: Maternal Mortality (per 100,000 live births)

Source: Created by author based on World Bank (2011) World Development Indicators (as posted on the World Bank website; downloaded on June 7, 2011).

IV.2. AIDS among Women

In the early 1990s, the threat of HIV/AIDS grew rapidly in Thailand. Ever since, there has been increasing efforts to stabilize and reduce the epidemic. In order to do so, Thailand has increased access to protection from getting infected by HIV/AIDS, like the promotion of condoms. These efforts are beginning to work as is shown by the increased use of condoms in the sex industry. While Thai men are no longer visiting brothels in the numbers they once did, there has been an increase in extra-marital affairs and casual sex, and condom use has fallen dramatically. Meanwhile, HIV infection rates have spiked among young people, pregnant women and intravenous-drug users.14

IV.3. Birth Control Efforts

A larger emphasis has been placed on education materials in order to encourage mothers to wait until they are older to have children. Additionally, related to the increased access to protection from getting infected by HIV/AIDS, women are being more careful with getting pregnant. “More women than ever are making choices over their birth spacing. The contraceptive prevalence rate (CPR) of married women in reproductive age between 15-44 years continues to increase and was up to 79.2 percent in 2001.”15 Despite such progress, comparing Thailand with other developing countries in East Asia and Pacific, the limited data available (see Figure 8) seems to indicate that Thailand is falling behind the progress made in other developing countries in East Asia and Pacific.

Figure 8: Contraceptive Prevalence (percent of women ages 15-49), all available years 1970-2009

![Figure 8: Contraceptive Prevalence](image)

Source: Created by author based on World Bank (2011) World Development Indicators (as posted on the World Bank website; downloaded on June 7, 2011).

Looking at total fertility, Figure 9 shows that Thailand has made very significant progress (and more so than the other developing countries in East Asia and Pacific) with reducing total fertility during the 1980s, reducing total fertility from 3.4 births per woman in 1980 to 2.1 births per woman in 1990. While total fertility continued to decrease during the 1990s (reducing total fertility to 1.8 births per woman in 2000), fertility rates have remained at about 1.8 births per women during the first ten years of this millennium. While Thailand’s fertility rate is today still lower than the average fertility rate of other developing countries in East Asia and Pacific, the difference has become marginal in recent years, and if trends continue as shown in Figure 9, the difference may soon be eliminated.

![Figure 9: Total Fertility Rate (births per woman), 1980-2009](image)

Source: Created by author based on World Bank (2011) *World Development Indicators* (as posted on the World Bank website; downloaded on June 7, 2011).

V.2 Education of Thai Women

Educational opportunities for women in Thailand are improving. Figures 10-12 show the female and male school enrollment ratios (in percent), respectively, for primary, secondary and tertiary schools for all available years during 1970-2009. While there are still less girls than boys attending primary school, the gender gap has decreased considerably from slightly more than 8 percent in 1971 to slightly less than 2 percent in 2009 (see Figure 10). With regards to secondary school enrollment, the gender gap had been eliminated by at least 1990 (there is no such data available for 1979-1989). Indeed, for the last three available years (2007-2009), female secondary school enrollment ratios exceeded that of male by slightly more than six percent. A similar trend exists for tertiary school enrollment, where the gender gap had been eliminated by at least 1993 (there is no such data available for 1979-1992) and for the last three available years (2007-2009), female tertiary school enrollment ratios exceeded that of male by about ten percent. As shown in all of the tables above, women are able to access a good education. As a result, more opportunities arise for women in politics and in the work place.
Figure 10: Female and Male Primary School Enrollment (percent), all available years 1970-2009

Source: Created by author based on World Bank (2011) World Development Indicators (as posted on the World Bank website; downloaded on June 7, 2011).

Figure 11: Female and Male Secondary School Enrollment (percent), all available years 1970-2009

Source: Created by author based on World Bank (2011) World Development Indicators (as posted on the World Bank website; downloaded on June 7, 2011).
VI. Thai Women and Politics

There is long history of a lack of women’s political participation in the country, “At both the national and local levels, women were excluded from active participation. Indirectly, however, they contributed to political power play, political exchange, alliance formations, and probably behind-the-scene plans and intrigues. Women were offered as tributes to kings and members of the royal family and to high-ranking nobles. Princesses were given in marriage in order to foster alliance and to strengthen political ties.”16 Women were given as trophies in politics because of their sexuality. Now, due to an increased access to educational opportunities and political reform, women are taking their place in Thai politics.

Prior to the 1997 Constitution, women were unable to hold seats in the Thai Parliament. The Thai Parliament is currently divided into upper and lower chambers. There are 650 members total. As shown in figure 13, in 1997, women only held 6 percent of the seats. This number remained steady for a few years, until it slowly increased in recent years. In 2010, women were voted into 13.3 percent of the parliament seats. This is still a small percentage, but it shows at least some progress. Some credit for this progress should be given to the United Nations, who has been working to help facilitate more recognition and activism of women in politics since the 1970s.17

VII. Migration, Gender-based Job Discrimination, and Sex Trafficking

Over the last few decades, women are being given more and more opportunities to become a part of the professional workplace. As a result, many are moving from rural areas to urban areas. However, not every woman is able to find a job, and therefore, many still continue to being forced into sex trafficking, a still popular industry in Thailand.

VII.1. Migration

As had been shown above, women are being offered more educational opportunities than before, and it is becoming increasingly accepted for women to become a part of the work force. This is causing many women to migrate from rural areas to urban areas to seek jobs. But even before the increase in the education level of Thai women, many Thai women were migrating to urban centers. The main reason for this migration has been due to experiencing different levels of development between rural and urban areas, which started to occur around the time of World War II, when Bangkok was thriving economically and politically.\(^{18}\)

Oftentimes, the gender of a particular person influences their migration patterns. Men still migrate more often than women, but their patterns are different: females dominate rural-urban migration streams while males dominate urban-to-rural streams.\(^{19}\) Currently, more and more women are beginning to migrate towards Bangkok. These women tend to be younger, as they are the ones looking for jobs because there is an arising expectation that these women will be able to provide for themselves and their parents. More jobs are also being offered to these women because companies know that they can hire women for slightly less pay.\(^{20}\) In addition,

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\(^{18}\) Pejaranonda, Santipaporn and Guest (1995).
\(^{19}\) Pejaranonda, Santipaporn and Guest (1995).
educational opportunities were not as good for women in rural areas as in urban areas. Since many jobs in the city are hospitality related, they do not require someone with a high educational background.

In addition to movement and migration by Thai people within the country, many women migrated to Thailand from poorer neighboring countries as well as politically more oppressed neighbors, especially during the late 1990s from Burma (now Myanmar). Unfortunately, during migration, many Burmese women and girls are highly vulnerable to exploitation and abuse as they are physically isolated from their communities when working as domestic workers in private houses and in the sex industry. This makes the establishment of safety networks difficult and often dangerous. Although many of these women were caught in Thailand illegally and returned to Burma, they began somewhat of a women’s movement with Thai women. Even female students began to get involved as the Thai woman noticed the injustices of the Burmese women. As stated in O’Kane (2006, p. 246), “[f]or most women activists, the Burma-Thailand borderlands provided their first opportunities to engage with each other across barriers of ethnic difference.”

VII.2. Gender-based Job Discrimination

Thai women are migrating, in large part, to seek jobs as they become an increasing part of the educated work force in Thailand. They are being given opportunities that they were not provided with before the 1990s. Women are still not being treated as equal to men, but the gap is narrowing. Previously, women were unable to hold the same jobs as many men in Thailand. Historically, it was a women’s job to take care of children, and tend to the household. Since the 1880s, and especially during the Vietnam War, many women have worked as sex slaves. Only within the past few decades had Thai women been present in the formal work place. The heaviest concentration of women at the lower end of the occupational hierarchy is in the service sector as domestic helpers, as restaurant and snack bar workers including cashiers and waitresses, and as entertainers, a euphemism for prostitution. According to the World Bank (2011), in 2008, 45.4 percent of women were employed in the nonagricultural sector.

Now, Thailand is making tracks as female professionals are playing a larger role than ever before in the workplace. The participation rate of women in the Thai workforce is higher than the average Asian participation rate of women. Although women still do not hold many high positions of power, there is excitement when they do. “It is always big and cheering news in the media when a Thai woman comes into a significant work position never before held by a female.” These women are being credited for the growing success of Thailand. “Women have been and continue to be key contributors to Thailand’s remarkable growth. Over the past two decades, women’s activities have expanded in all spheres, owing to robust economic growth, a higher level of education, and a falling fertility rate.” The private sector has really contributed to women’s involvement in the work place. “The rapid expansion of the private sector has opened new opportunities for women [...]. In 2007, 35.8 percent of female workers were private

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21 Min with the Burmese Women’s Union’ Research Team (2000).
employees.” Overall, Thailand’s great strides of equality in the work place will continue, and hopefully carry over and make an impact in other areas as well.

<table>
<thead>
<tr>
<th>Number of Women Executives</th>
<th>Number of Companies</th>
<th>Percentage</th>
</tr>
</thead>
<tbody>
<tr>
<td>8 persons</td>
<td>8</td>
<td>3.9</td>
</tr>
<tr>
<td>5-7 persons</td>
<td>27</td>
<td>13.3</td>
</tr>
<tr>
<td>3-4 persons</td>
<td>73</td>
<td>36.0</td>
</tr>
<tr>
<td>1-2 persons</td>
<td>77</td>
<td>37.9</td>
</tr>
<tr>
<td>0 person</td>
<td>18</td>
<td>8.9</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>203</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

Source: Created by author based on Wailerdsak (2009).

VII.3. Sex Trafficking

Unfortunately, despite women being provided more job opportunities, thousands are still involved in sex trafficking. Many are migrating to cities, but it is possible that once they do, they are unable find a job. Therefore, many of the women may become involved in sex trafficking, a historically popular industry in Thailand. In Thailand, sex trafficking has become a part of the culture. Women are often demeaned and taken advantage of in this country. It is now against the law, but it has not always been this way, and despite the illegality, sex trafficking continues to be widespread in Thailand. As stated in the report by Vital Voices Global Partnership (2007, p. 3): “International law prohibits trafficking in persons. While the Kingdom of Thailand has committed itself to eliminating human trafficking, Thailand remains an origin, source and transit state for human trafficking.”

There are many root causes that contribute to the problem. One specific cause is the lack of citizenship. Referring to studies by the United Nations Educational, Scientific and Cultural Organization (UNESCO), Feingold (2005, p. 26; quoted in Foster Gorman, 2009) states that a “lack of proof of citizenship is the single greatest risk factor for a hill tribe girl or woman to be trafficked or otherwise exploited.” Without being documented in the country, it is nearly impossible to attain a job. Therefore, many women result to being sex trafficked in order to make somewhat of a living and have a shelter.

VIII. Conclusions

Thailand is a country that is on the rise. With more political certainty and GDP growth, there is hope that the economic situation in the country will continue to improve on this upward trend. Over the course of the recent years, political and other factors have played a part in Thailand’s struggle. However, there finally seems to be some stability.

Thailand is historically known for its poor treatment of women. They used to be denied basic rights, and play no role in society outside of the home. Fortunately, all of this seems to be changing. Women are becoming more educated. As a result, they have the knowledge to make a life for themselves. A few are active in parliament by holding elected positions, and people are becoming more accustomed to them holding higher positions in the workplace. In addition, the maternal mortality rates and birth rates are lower as a result of extra care of women and increased education about birth control methods. In comparison to many of Thailand’s bordering countries, it seems to be making the most improvements.

Sex trafficking is still a prevalent industry in Thailand. Although it has been made illegal, escort services and prostitution are still very common. Many men make their way to the country just for these reasons. This is the one area that Thailand needs to pay special attention to. In today’s society, women should not be demeaned in such as way. As women’s roles continue to improve in Thailand, it is important that more is done to prevent this from happening.

Women in Thailand are fortunate that they have been able to rise in society. Although it has taken a long time, they are finally being able to have the rights and access to the same opportunities that men do. Thailand has shown that the country is ready for this change.

References


Deforestation in Madagascar: Consequences of Population Growth and Unsustainable Agricultural Processes

Megan Clark

Abstract
Located in the Indian Ocean just off the east side of Africa, Madagascar is an island country struggling with problems of deforestation and soil erosion, like many other African countries. Deforestation is due in part to a rising need of using land for food production. However, as it turns out, deforestation has actually damaged Madagascar’s agricultural prospects. Furthermore, deforestation in Madagascar is the source for a loss of habitats for unique species, an increase of carbon dioxide emissions, and soil erosion. This article provides an overview of Madagascar’s deforestation crisis. It reviews Madagascar’s loss of forests, the species at risk due to deforestation, and the negative aspects of deforestation on the local ecosystems and communities. The article also discusses some possible solutions for reversing deforestation in this country.

I. Introduction
Madagascar, the world’s fourth largest island, is home to some of the world’s most diverse and unique forests. However, Madagascar is struggling with severe problems of deforestation. Furthermore, Madagascar also suffers from soil erosion, largely due to deforestation and harsh agricultural activities that degrade the land. Although the degradation of the land in Madagascar has been ongoing, there has been little governmental concern about it (Harper et al., 2007). This kind of ongoing forest destruction is threatening thousands of species of animals and could possibly lead to their extinction (Harper et al., 2007). This kind of damage is long lasting and sometimes impossible to reverse.

Like many developing countries, especially in Africa, Madagascar is beginning to feel the consequences of unsustainable agricultural processes. As a result of a booming population and, hence, an increase in mouths to feed, agricultural production had received a priority over environmental protection. However, today, it is clear that unless Madagascar promotes
sustainable agriculture, its land will be negatively impacted and hurt long-run agricultural production.

This article focuses on Madagascar’s deforestation. Following a brief literature review and some empirical background, the subject of deforestation in Madagascar is broken down in reviewing the causes of deforestation and discussing the main effects of deforestation in Madagascar. The article closes with some conclusions and suggestions.

II. Literature Review

There is a plethora of literature on deforestation in Africa. While there is far less literature specific on Madagascar’s deforestation, it has still been discussed for many years now and is beginning to take on more and more sophisticated issues. The following paragraphs provide some examples of various media forms that cover Madagascar’s deforestation, including academic articles, news articles, websites, films and atlases.

- The article entitled *Deforestation in the Madagascar Highlands—Established “Truth” and Uncertainty* by Jorgen Klein (2002) touches on many of the topics central to this article on deforestation in Madagascar. It discusses the relationship between humans and the environment, environmental change in developing countries, and specifically the problem of deforestation in Madagascar. It also includes how deforestation began in Madagascar.

- The article titled *Fifty Years of Deforestation and Forest Fragmentation in Madagascar* by Grady J. Harper et al. (2007) discusses a bit about deforestation regarding Madagascar’s forests while detailing a study that mapped Madagascar into different types of forest cover. Although the study on forest cover was not as much of interest to this article, the information in the summary and introduction on tropical forests and deforestation is very useful. It also discusses the images taken of Madagascar with aerial photographs and gives specific information and percentages on the decreases in forest cover.

- In the news article in the British Daily *The Independent*, Daniel Howden (2007) explains the harsh reality of deforestation and what it means to us globally. It gives some good statistics about deforestation. The articles also explains why forests are a vitally important natural resource, how slash and burn techniques in Madagascar are damaging to the atmosphere, and how incentives for sustainable agriculture need to be put in place by the government.

- The website *Earth Trends* by the World Resources Institute (2007) gives country profiles for Madagascar concerning various themes, including biodiversity, protected areas, forests and grasslands.

- The Atlas edited by Rebecca Johnson and Munyaradzi Chenje (2008), published by the United Nations Environment Programme (UNEP), provides in-depth information on Africa’s and Madagascar’s geography, changing environment, ecosystems and protected areas, transboundary water resources, and transboundary movement of people and pollutants.

- Lastly, a film entitled *Madagascar: Agro-Ecology* by Films on Demand (2009) gives a
good background on Madagascar and the inhabitants that live there while also going into depth on sustainable agriculture practices such as direct sowing, mulch-based and conservation agriculture (usually referred to as DMC). It touches on the ways that Madagascar can improve their agriculture and decrease the deforestation and land erosion. It also discusses why the poor people who rely on agriculture don’t always want to change their ways of agriculture to adapt more sustainable practices.

III. Empirical Background

Madagascar is the world’s fourth-largest island, strategically located along the Mozambique Channel. Due to high population growth, which resulted in a four-fold increase in Madagascar’s population during the last 50 years (see Figure 1), Madagascar has today about 20 million inhabitants, most of them are very poor. According to the latest data available by the World Bank (2011), in 2005, 68 percent of Madagascar’s population lived below $1.25-a-day and 90 percent of Madagascar’s population lived below $2-a-day. Fertility remains with an average of 4.6 children per woman very high in Madagascar (even though it is slightly below that of other developing countries in Africa (SSA), which have an average fertility rate of 5.0 births per woman).¹

![Figure 1: Population of Madagascar, 1960-2009](image)

Source: Created by author based on World Bank (2011) *World Development Indicators* (as posted on the World Bank website; downloaded on June 7, 2011).

Figure 2 shows GDP per capita based on purchasing power parity (PPP) for Madagascar and SSA from 1980-2009. While Madagascar has always been poorer than the average SSA country, the difference between Madagascar and SSA has increased sharply during the last ten years. While GDP per capita (in constant 2005 international dollars) increased marginally from 1980 to 2009 for SSA, it actually decreased over the same period for Madagascar. Today, an average person in Madagascar earns less than half of an average person in SSA. The overwhelming majority of Madagascar’s population lives in rural areas (70 percent) and works in agriculture: 81.5 percent of Madagascar’s male employees and 82.5 percent of Madagascar’s female

¹ World Bank (2011).
employees.²

![Figure 2: GDP per capita (PPP) for Madagascar and SSA](image)

Source: Created by author based on World Bank (2011) *World Development Indicators* (as posted on the World Bank website; downloaded on June 7, 2011).

In Madagascar, there is rampant illegal deforestation as a result of slash and burn techniques, conflicts over land, increasing cost of fertilizers, and poor productivity. The growing need for sustainable agriculture has become more present than ever in Madagascar, but has been placed too far down on the list of priorities.

**IV. Definition, Degree and Causes of Deforestation**

**IV.1. Definition**

According to Johnson and Chenje (2008), deforestation is when a once forested area gets removed for the use of agriculture, pasture, urban development, logging, or wasteland. When this destruction of a natural environment occurs, a degraded ecosystem is likely to follow. A degraded ecosystem is the result of a loss of habitat and a reduction in biodiversity. Also, the erosion of soil is usually a consequence of deforestation.

**IV.2. Degree of Deforestation in Africa and Madagascar**

As shown in Figure 3, Africa, as a whole, is facing many environmental issues that need addressing, including desertification, water scarcity, pollution, threats to biodiversity, overfishing/coastal degradation, deforestation, land degradation, poaching/hunting, and mining. Based on the number of countries affected by these kinds of environmental issues, deforestation is the most common problem in African countries, followed by land degradation. In comparison to other continents, Africa is facing huge deforestation issues. The rate of deforestation is higher in Africa than in any other continent and of the ten countries in the world with the largest annual net loss of forested area, six are in Africa (Johnson and Chenje, 2008).

² World Bank (2011).
Based on various studies that try to estimate Madagascar’s previous forest cover, Madagascar has lost between at least 50 percent to about 90 percent of its forests throughout human history (see Johnson and Chenje, 2008). Figure 4 shows an image of Southern Madagascar, where, with the exception of a narrow line towards the eastern coast, basically all forest has disappeared.

**Figure 4: Aerial Image of South of Madagascar**

Based on an analysis of more recent aerial photographs, Harper et al. (2007) conclude that forests covered 27 percent of Madagascar in 1950, which declined to only 16 percent by 2000. That is a huge loss (about 40 percent) in a time span of only 50 years. This data conflicts however with World Bank (2011) data, which has put Madagascar’s forests at 22.6 percent of all land area in 2005. Furthermore, according to World Bank (2011), Madagascar’s recent deforestation has been less severe, with a decrease in forest area from 23.6 percent in 1990 to 22.6 percent in 2000 and 21.6 percent in 2010.

The World Bank (2011) data is also inconsistent with that of the World Resources Institute (2007) Earth Trends data, shown in Figure 5. Figure 5 shows the percent change in forest area, disaggregated for natural forests and plantation forest, in Madagascar as well as the world between 1990 and 2000. For Madagascar, natural forests declined by about 10 percent, while plantation forests increased by less than 2 percent; hence, there is an overall loss of 8 percent between 1990 and 2000. At the global level, natural forests declined by about 4 percent, while plantation forests increased by about 3 percent.

Figure 5: Percentage Change in Forest Area by Type, 1990-2000

Despite some debate about the degree of Madagascar’s deforestation, it has been largely agreed upon that the highlands of Madagascar were almost completely forested at the time of human settlement and have been gradually deforested as a result of human activities (Klein, 2002). Research has proven this hypothesis through the presence of tree trunks and tree fruits when discovering fossils of extinct animals (Klein, 2002). Also, pollen spectra dated from about AD 1000 can be interpreted as being from forest vegetation, proving that forests did once cover land that is no longer forested (Klein, 2002).

In conclusion, there is no disagreement that forests once covered a majority of Madagascar, but the exact percentage it is debatable. Despite the disagreement about the amount of forested land that used to exist on Madagascar, it is evident that the deforestation that has been ongoing in
IV.3. **Causes of Deforestation**

Most of the causes of deforestation, including logging, land conversion to agriculture, wildfires, cutting down trees for firewood, and conflict over land rights tend to be caused by increased population growth and a need for more land mostly for agricultural production (Johnson and Chenje, 2008). Increased population growth is also the primary cause of deforestation in Africa and certainly in Madagascar.

Most of the deforestation in low income countries is carried out via slash and burn. Slash and burn is an agricultural technique that involves the cutting and burning of forests to create fields (Klein, 2002). It is a practice that has existed for hundreds of years. Slash and burn requires little technology or tools because it mainly relies on the use of fire to burn down forests. The practice of slash and burn techniques has always been a central element in Madagascar’s traditional environmental management (Klein, 2002).

V. **Main Consequences of Deforestation**

V.1. **Temporary Increase in Agricultural Production**

Burning of pastures has always been a useful tool for the farmers because it works for them in the short-run, which is what most subsistence farmers are concerned with in Madagascar. Burning aids farmers with fertilization, space for new production lands, and even wards off invading locusts and rats (Klein, 2002). The ash from the burning of the trees fertilizes the soil and makes crops easy to plant at the beginning of the next rainy season (Klein, 2002). However, after a few seasons, the soil quality begins to decline and can no longer support crops. When this occurs, farmers usually are forced to abandon the fields and move on to new forests and repeat the process all over again.

The continuation of slash and burn techniques in society today is hugely detrimental because the effects are long lasting and difficult to restore. Still, many farmers in Madagascar strongly believe in the traditional methods of farming, even if those methods are hazardous to the environment and lead to increased deforestation. Slash and burn techniques has generated huge amounts of conflict between the local farmers and the government for over a hundred years (Klein, 2002). The conflict of slash and burn techniques is a parallel to the conflict between the western scientific view of agriculture and the traditional land-use methods of peasant farmers (Klein, 2002). Although the local farmers are the ones using slash and burn techniques, they are also the ones who are feeling the impact of these techniques the most in the long-run.

V.2. **Land Erosion and River Contamination**

Deforestation also leads to detrimental land erosion. Erosion in Madagascar is severe and exists on a large amount of hillsides and on slopes (Klein, 2002). The gullies of Madagascar’s highlands have erosion rates that are about seven times the global average (Klein, 2002). This erosion on hillsides and gullies leads to extensive amounts of sediment in streams and rivers and causes a major problem for farmers. This kind of extensive deforestation in Madagascar is a good indicator of the types of erosion that can form when lands have been extensively degraded. Deforestation also leads to drought as the land is eroded and trees do not block the pathway of water or soak in the water. Instead, the water picks up sediment from the ground and overflows
the rivers into people’s crops. This kind of overflow can contaminate crops and result in poor food quality. In Madagascar, many poor farmers are facing this problem as many of their rivers are contaminated with sediment (Films Media Group, 2009).

V.3. Emission of Carbon Dioxide

Deforestation impacts the global carbon cycle as a result of an increase in carbon released when trees are cut, burned, or decomposed. The increase in carbon adds to the problem of global warming. Forests soak in the carbon dioxide in the environment and essentially are the thermostat for the Earth (Howden, 2007). The damaging slashing and burning technique that many people carry out in Madagascar and around the world is the second largest source of emission of greenhouse gases. It is second only to the burning of fossil fuels. Deforestation has become such a problem of epic proportions that scientists are going as far to say, “one day’s deforestation is equivalent to the carbon footprint of eight million people flying to New York” (Howden, 2007).

V.4. Endangered Species

Deforestation leads to the destruction of natural habitats, the endangerment of species, and the decrease in earth’s biodiversity. Forests contain 60 percent of the earth’s biodiversity and forests supply us with over 25 percent of our medicine from tropical plants (Howden, 2007). Globally, Africa’s forests are needed for climate regulation and sanctuaries for an abundance of species and plants (Johnson and Chenje, 2008).

As a result of the loss of Madagascar’s forests, an estimated 8,000 endemic species have been put at risk (Johnson and Chenje). Madagascar and the Indian Ocean Islands are home to exceptional biodiversity. Eight plant families, four bird families, and five primate families are found in these places and nowhere else on Earth (Johnson and Chenje). Madagascar alone has more than 50 lemur species, although 15 have become extinct as a result of human action (Johnson and Chenje). This kind of biodiversity needs to be protected or else more species will go extinct.

An example of a species found in Madagascar that has been lead to near extinction is the pinstripe dambo. The pinstripe dambo is a type of fish that used to be found in a small region of Madagascar but now most of the population of this species can be found only in captivity. It is guessed that this species is completely extinct in its natural habitat. This extinction is due mostly to deforestation, introduction of foreign species, and overfishing (Johnson and Chenje). There are many species like the pinstripe dambo that have faced extinction, or actually have become extinct, due to human actions of chopping down forests and destroying these animals’ natural habitat.

It is vitally important to stop deforestation in Madagascar to prevent the loss of certain animal species. More than 90 percent of Madagascar’s endemic animal species live exclusively in the forests (Harper et al., 2007). Forests are the natural habitat for so many species in Madagascar that the issue of deforestation becomes not just a problem for us humans, but also an even bigger problem for all the animals that depend on the forests. The forests of Madagascar are some of the highest priority areas in the world for biodiversity conservation (Harper et al., 2007). This alone is reason enough to put an end to this rapid deforestation. Also, there is a delayed effect of species extinction following habitat destruction where the results of deforestation on species are
not seen until a later time. This could mean that many species in Madagascar are living on “borrowed time” and could be nearing extinction (Harper et al., 2007).

Figure 6 shows the species that are threatened by extinction in Madagascar. Table 1 shows the species richness in Madagascar. Both Figure 6 and Table 1 give a visual example of how diverse Madagascar really is in terms of different species and represent why these species need to be protected.

**Figure 6: Threatened Species, Madagascar, 2002-2003**

![Threatened Species, Madagascar, 2002-2003](image)


**Table 1: Species Richness and Endemism in Madagascar**

<table>
<thead>
<tr>
<th>Taxon</th>
<th>No. of species</th>
<th>% Endemic</th>
<th>Source</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plants</td>
<td>12,000</td>
<td>85%</td>
<td>Gautier &amp; Goodman (2003)</td>
</tr>
<tr>
<td>Birds</td>
<td>209 (breeding)</td>
<td>51%</td>
<td>Hawkins &amp; Goodman (2003)</td>
</tr>
<tr>
<td>Mammals</td>
<td>117</td>
<td>90%</td>
<td>Garbutt (1999)</td>
</tr>
<tr>
<td>Reptiles</td>
<td>346</td>
<td>&gt;90%</td>
<td>Raxworthy (2003)</td>
</tr>
</tbody>
</table>

Source: Harper et al. (2007)

**VI. Conclusions and Suggestions**

Although Africa has a large population that is increasing rapidly, the constant chopping down of forested areas to convert to agricultural land needs to either decline or use more sustainable methods. Converting forests to farms is obviously necessary for food production, but soon the environmental impacts resulting from the degradation of land will be too much to bear for the people in Madagascar and other developing countries. Habitats will be lost, species will die off, the carbon cycle will be negatively impacted, global warming will increase, and a decrease in
arable land will result.

Deforestation is a serious subject for the world and for developing countries such as Madagascar. The people of Madagascar depend on their local forests for shelter, food, energy, shade, medicine, soil protection, and much more. The animals of Madagascar also depend on the forests to continue living. As evidenced by the pinstripe dambo, many species of Madagascar are suffering from the poor agricultural procedures and the growing human population. Unless something is done to decrease deforestation, the people of Madagascar may find themselves without any kind of forest and will become increasingly susceptible to global warming.

The parts of Madagascar that have already been deforested act as a sort of warning sign of what will happen to the rest of the forests on the island if action is not taken (Klein, 2002). The deforested land also acts as a warning sign to other countries going through similar problems. The deforested areas of Madagascar fully exemplify the consequences of deforestation on a population and on the land. The effects of deforestation have not only been severe on environment, but also on the local people and species. Deforestation impoverishes not only the land, but also the people (Klein, 2002).

The government of Madagascar has not approached the problem with the correct methods. So far, the main approach of the government has been to discourage deforestation through taxes and fines. This approach has not only been unsuccessful, it actually has impoverished the farmers further. The end result is increased amounts of poverty and a continuation of slash and burn techniques due to the fact that poor farmers often have no other choice than to use unsustainable farming methods (Klein, 2002).

In order to work against deforestation in the future, conservation programs must work with the local farmers, because without their participation in the fight against deforestation, nothing can be accomplished. We must integrate local communities into the environmental policy and provide further incentives for sustainable agricultural practices (Klein, 2002). Most importantly for Madagascar, we must halt further primary forest clearance as soon as possible and work towards forest restoration (Harper et al., 2007). Also, a continuation of support for halting deforestation must continue through increased education and understanding of deforestation in Madagascar (Harper et al., 2007). Without continued support for this cause, nothing can or will be done since the people of Madagascar will not be able to fully end the deforestation themselves.

Madagascar needs to work toward sustainable agriculture methods such as direct sowing, mulch-based and conservation agriculture (DMC). DMC does not require farmers to plant the land anymore, instead with DMC, farmers let the stocks rot and fertilize the soil naturally and form a protective layer over the ground. Through DMC, farmers do not need to use harmful fertilizers or pesticides, but instead they are cultivating the soil sustainably. DMC also requires a certain kind or organization of crops by putting certain plants with crops of interest. This prevents erosion and creates better quality food. However, not all farmers are convinced of the benefits of DMC. The biggest problem of DMC is educating farmers on how DMC can help boost their crop production while protecting the environment, and convince them to change their ways. Many farmers have become attached to traditional farming techniques and therefore, it is difficult to convince them to change their ways.

A related problem is that most poor farmers do not own the land they farm on, so they do not care much about long-term benefits of their farming. More solutions to reduce deforestation and
promote better farming methods are to promote stronger property rights and increase government involvement in sustainable agriculture through laws against techniques such as slash and burn that damage the environment. If farmers actually own the land they farm, they will be less likely to erode the land and make efforts to protect it.

If government involvement creates the incentives for sustainable agriculture and develops laws against deforestation, then huge progress can be made and the rate of deforestation can be decreased.

References


