

**PLIGHT OR PLUNDER?
NATURAL RESOURCES AND CIVIL WAR**

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THE NATURE OF WARFARE: NATURAL RESOURCES AND CIVIL WAR

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Introduction

Although the study of international security has long been fixated on war between countries, especially great powers, three-quarters of all armed conflicts since 1945 have been *within* countries, and the vast majority of these conflicts have occurred in the developing world (Holsti 1996). The number of civil wars peaked in the early 1990s and has been declining gradually ever since, but they remain a scourge on humanity. Indeed, as many people have died as a result of internal strife since 1980 alone as were killed in the First World War (Leitenberg 2003). Armed conflicts have also crippled the prospect for a better life in many countries, especially in Sub-Saharan Africa and parts of Asia, by destroying essential infrastructure, decimating social trust, encouraging human and capital flight, exacerbating food insecurity, spreading disease, and diverting precious financial resources toward military spending. Compounding matters further, the damaging effects of civil wars rarely remain confined within the afflicted countries. In the past decade alone, tens of millions of refugees have spilled across borders, producing significant socioeconomic and health problems in neighboring countries. Instability has also rippled outward as a consequence of cross-border incursions by rebel groups, disruptions in trade, and damage done to the reputation of entire regions in the eyes of investors. Globally, war torn countries have become havens and recruiting grounds for international terrorist networks, organized crime, and drug traffickers (Collier et al. 2003; Marshall and Gurr 2003).

This chapter examines a crucial component of the political economy of civil wars: the connection between growing pressures on natural resources, stemming from rapid population growth and the negative externalities of economic globalization, and armed conflict in developing countries. Recent research suggests that the linkages here are real and important. A number of high profile case studies, for example, demonstrate that population growth, environmental degradation, and natural resource competition have interacted in many instances to produce or exacerbate civil and ethnic violence (Baechler et al. 1996; Baechler and Spillman 1996; Homer-Dixon and Blitt 1998; Kahl 1998; Homer-Dixon 1999). Quantitative studies analyzing the correlates of civil wars over the past several decades also suggest that countries that are highly dependent on natural resources (Collier et al. 2003), as well as those experiencing high rates of deforestation, soil degradation, and low per capita availability of arable land and freshwater have higher than average risks of falling into turmoil (Hauge and Ellingsen 1998; Cincotta, Engelman, and Anastasion 2003, chap. 5).

Despite this growing body of scholarship, analysts disagree as to whether too few or too many resources are the problem. Neo-Malthusians contend that natural resource scarcity makes societies more conflict-prone. Neoclassical economists challenge this view, arguing that greater dangers flow from a local abundance of natural resources. This chapter engages the debate between neo-Malthusians and neoclassical economists as a means of deepening our understanding of the role natural resources play in contemporary civil wars.¹ I argue that many of the arguments put forth by these two approaches are not as opposed as they initially appear, making it possible to pool many of their insights. Much of the apparent tension is resolved once it is recognized that each focuses on different levels of analysis, different types of resources, and different timeframes. Neo-Malthusians tend to be most concerned with the problems created by the degradation and depletion of renewable resources (e.g., arable land, freshwater, forests, and fisheries), while neoclassical economists emphasize the challenges emanating from non-renewable resources (e.g., oil, gemstones, and other valuable minerals).² Furthermore, both neo-Malthusians and neoclassical economists agree that problems emerge from natural resource dependence; their apparent disagreements stem mainly from the fact that each emphasizes pathologies at different temporal stages of this dependence. The least contentious point between the two approaches relates to the political context most likely to produce violent conflict. Both generally agree that weak states with authoritarian or transitional political institutions are more likely to experience resource related strife.

The chapter is divided into four sections. The first section sets the stage by briefly describing the intersection between demographic change, economic globalization, and natural resources. The second section then provides an assessment of the competing arguments advanced by neo-Malthusians and neoclassical economists regarding the relationship between natural resources and civil war. Finally, the last section draws lessons from this debate for the future. Given projected levels of population growth, economic expansion, and inequality, I conclude that both approaches point to turbulent times ahead unless difficult behavioral and policy changes are adopted.

Pressures on the Planet

The past century witnessed unprecedented population growth, economic development, and environmental stress, changes that continue to this day. From 1900 to 2000, world population grew from 1.6 billion to 6.1 billion. Since 1950 alone, 3.5 billion people have been added to the planet, with 85 percent of this increase occurring in developing and transition countries (World Bank 2003b, p. 7; Worldwatch Institute 2003, p. 67; UNPD 2003). Worldwide population growth rates peaked in the late 1960s at around 2 percent a year, but the current rate of 1.2 percent still

represents a net addition of 77 million people a year. The differential population growth rates of rich and poor countries have also become more pronounced. The current rate in high-income countries is 0.25 percent compared to 1.46 percent for developing countries as a whole. Moreover, within the subset of the 49 *least* developed countries the rate is currently 2.4 percent (UNPD 2001, p. 5; UNPD 2003: vi).

The global economy has also experienced tremendous growth over the past century. Estimates vary, but the global economy most likely increased 20 to 40 times between 1900 and 2000. The tempo of change has been especially pronounced since the end of the Second World War; between 1950 and 2002, the global economy grew from 6.7 trillion to 48 trillion (UNPD 2001, p. 1; Worldwatch Institute 2003, pp. 44-45). This enormous economic expansion occurred during a time of accelerating globalization and, especially since the 1980s, rising faith in the power of markets and privatization. Economic growth, globalization, and the harnessing of market forces have allowed for average living standards to advance faster than world population growth, improving the quality of life for billions. Nevertheless, the benefits of economic growth and globalization have been unevenly distributed within and across countries and regions (UNDP 2003, p. 16).

In the 1990s, for example, average per capita growth was less than 3 percent (the threshold needed to double incomes in a generation given constant rates of inequality) in 125 developing and transition economies, and 54 of these countries were actually poorer in 2000 than in 1990.³ More than 1.2 billion people currently live in extreme poverty, defined as an income of less than \$1 a day, and a total of 2.8 billion (more than half the population of the developing world) live on less than \$2 a day. Although the proportion of people suffering from extreme poverty fell from 30 percent to 23 percent during the 1990s, the absolute number only fell by 123 million due to a 15 percent increase in the population of low- and middle-income countries. Driving most of this progress was China, which managed to lift 150 million people out of poverty. However, 37 of 67 countries with data saw poverty rates increase in the 1990s and, excluding China, the total number of extremely poor people worldwide *increased* by 28 million. Worst off was Sub-Saharan Africa, where per capita income fell by 5 percent and 74 million additional people descended into extreme poverty (producing a regional total of 404 million living on less than \$1 a day in 1999). Other key indices of human welfare also reveal a similar pattern: overall progress but also numerous countries falling further behind. Over the past decade, 34 countries had lower life expectancy, 21 countries had a larger portion of people hungry, and 14 had more children dying before age five (UNDP 2003, pp. 2-3, 5, 34, 40-41; World Bank 2003a, pp. 4-5, 9; World Bank 2003b, pp. 1-3).

This pattern is also reflected in widening gaps between rich and poor. In 1960, the ratio between the GDP per capita in the 20 richest and 20 poorest countries was 18 to 1; in 1995, the ratio was 37 to 1 (Worldwatch Institute, pp. 18, 88). Between 1980 and the late 1990s, inequality also increased *within* 33 of 66 countries for which there is adequate data available. All told, the richest 5 percent of the world's people now receive 114 times the income of the poorest 5 percent and the richest 1 percent receive as much as the poorest 57 percent. Non-income measures also point to stark inequalities. A decade ago, children under five were 19 times more likely to die in Sub-Saharan Africa than in rich countries, but they are now 26 times more likely. Indeed, Latin America and the Caribbean were the only parts of the developing world where disparities in infant mortality compared to rich countries did not widen in the 1990s (UNDP 2003, pp. 5, 39-40).

Rapid population and economic growth over the past century have placed severe and accelerating pressures on natural resources and planetary life-support systems. The traditional Malthusian notion that exponential population growth alone drives strains on the environment has long been refuted; no serious thinkers, including neo-Malthusians, now maintain that human-induced environmental changes are a mere function of numbers. Rather, the relationship between population growth and the environment is mediated by consumption habits, as well as the technologies used to extract natural resources and provide goods and services. The population-environment connection is thus affected by the choices of individuals, firms, and governments, and it is deeply embedded in the processes of economic expansion and globalization.⁴

At both the global and local levels, resource depletion and environmental degradation result from extreme wealth and extreme poverty. The material intensive and pollution-laden consumption habits and production activities of high-income countries are responsible for most of the world's greenhouse gases, solid and hazardous waste, and other environmental pollution. High-income countries also generate a disproportionate amount of the global demand for fossil fuels, non-fuel minerals, grain, meat, fish, tropical hardwoods, and products from endangered species (World Bank 2003a, p. 118; Worldwatch Institute 2003, p. 17; World Resources Institute 2000, pp. 26-27).

Although consumption and production activities by rich countries may be the primary drivers of global environmental challenges, poverty and inequality within developing countries also places burdens on the environment, especially on local renewable resources. Impoverished individuals in developing countries frequently live in the most fragile ecological areas and are often driven to overexploit croplands, pastures, forests, fisheries, and water resources in order to eke out a living. Many have been forced to migrate to marginal areas due to overcrowding on

better land. In the past 50 years, the number of people living on fragile lands in developing countries doubled to 1.3 billion,⁵ and rural population growth remains higher than average in countries with 30 percent or more of their population on fragile land. Fragile ecological areas, which represent 73 percent of the Earth's land surface, have very limited ability to sustain high population densities and are particularly vulnerable to degradation, erosion, flooding, fires, landslides, and climatic change (World Bank 2003a, p. 118; World Bank 2003b, pp. 7-8, 60-67; Worldwatch Institute 2003, p. 17).

Numerous signs suggest that the combined effects of population growth, unsustainable consumption, and extreme poverty are taking their toll on the environment. More natural resources have been consumed since the end of the Second World War than in all of human history to that point (McKibben 1998, p. 63). The consumption of nonrenewable resources has significantly increased, although consumption has risen at a slower rate than population and economic growth due to changes in technology. The global consumption of fossil fuels (which account for 77 percent of all energy use) in 2003 was 4.7 times the level it was in 1950 (Worldwatch Institute 2003, p. 34). High-income countries consume more than half of all commercial energy and per capita energy consumption is five times greater than in developing countries (World Bank 2003a, p. 118). In terms of non-fuel minerals, 9.6 billion tons of marketable minerals (e.g., copper, diamonds, gold) were extracted in 1999, almost twice as much as in 1970. And, once again, high-income countries account for the majority of mineral demand (Sampat, p. 113).

In terms of renewable resources, the World Wildlife Fund (WWF) has recently calculated humanity's "ecological footprint" by comparing renewable resource consumption to an estimate of nature's biological productive capacity. A country's ecological footprint represents the total area (measured in standardized global hectares [ha] of biologically productive land and water) required to produce the renewable resources consumed and to assimilate the wastes generated by human activities. In 1999, each person on the planet demanded an average of 2.3 global ha, but countries varied widely in their footprint. On average, high-income countries demanded 6.5 biologically productive ha per person compared with 2 ha for middle-income countries and 0.8 ha for low-income countries. All told, the global footprint in 1999 amounted to 13.7 billion biologically productive ha, exceeding the 11.4 billion ha estimated to exist by about 20 percent. While the ecological footprint approach is only a partial measure of the impact humanity is placing on nature, it does suggest an unsustainable rate of consumption of renewable resources over the long-run. Indeed, the WWF calculates that humanity has been running an ecological deficit with the Earth since the 1980s (Wackernagel et al. 2002; WWF 2002).

This conclusion is reinforced by signs of growing depletion and degradation of renewable resources. Worldwide, 23 percent of all cropland, pasture, forest, and woodland (totaling 2 billion ha) have been affected by soil degradation since the 1950s, impacting the livelihoods of perhaps 1 billion people. Of these lands, about 16 percent are so severely degraded that the change is too costly to reduce, 46 percent are moderately degraded, and 39 percent are lightly degraded (UNDP 2003, p. 10; World Bank 2003b, p. 2). Deforestation has also been rapid over the past century. Worldwide, there were 5 billion ha of forested area at the beginning of the 20th century; now there are less 4 billion ha. One-fifth of all tropical forests have been cleared since 1960, with the bulk of deforestation occurring in developing countries. In the 1990s alone, low-income countries lost 8 percent of their forested area as a result of global and local demand for timber, the conversion of forests into large-scale ranching and plantations, and the expansion of subsistence agriculture (World Bank 2003a, p. 118; World Bank 2003b, p. 3).

Land resources are not the only ones under siege. Freshwater, which is critical for both human survival and economic development, is becoming increasingly scarce in many areas. Over the past 25 years, global per capita water supplies have declined by one third, and 1.7 billion people in developing regions are currently experiencing water stress (defined as countries that consume more than 20 percent of their renewable water supply each year). If current trends persist, as many as 5 billion people could face such conditions by 2025 (UNDP 2003, pp. 10, 125; World Bank 2003a, p. 118; World Bank 2003b, p. 2). Finally, about 34 percent of all fish species are at risk from human activities and around 70 percent of commercial fisheries are either fully exploited or overexploited and experiencing declining yields. This is not only troubling from a biodiversity perspective; millions depend of fisheries for employment and 1 billion people worldwide rely on fish as their primary protein source (UNDP 2003, p. 10; World Bank 2003b, p. 3; World Resources Institute 2000, p. 70).

The Natural Resources-Civil War Connection

Since the early 1990s, a number of academics and international security specialists have argued that demographic and natural resource pressures pose significant threats to political stability in developing countries. Initially, this discussion was dominated by neo-Malthusians, but more recently a number of scholars working within the tradition of neoclassical economics have entered the fray. Neo-Malthusians and neoclassical economists agree that natural resources can play a role in causing or exacerbating civil wars, but they disagree as to the character of this relationship. Neo-Malthusians contend that population growth, environmental degradation, and scarcity interact to place strains on societies and states, making countries more vulnerable to

armed conflict. Neo-classical economists, in contrast, argue that abundant supplies of valuable natural resources are more likely to produce strife.

Deprivation and State Failure

Neo-Malthusians argue that rapid population growth, environmental degradation, resource depletion, and unequal resource access combine to exacerbate poverty and income inequality in many of the world's least developed countries (Merrick 2001; Merrick 2002). In stagnant economies, rapid population growth can contribute to declining wages, unemployment, and landlessness because the labor force expands faster than available jobs. Environmental degradation and depletion can also worsen poverty, especially among those forced by population pressures and unequal land distribution to live on marginal land. Some 3.2 billion people in developing countries live in rural areas and, for many of these individuals, both long-term environmental stress (e.g., deforestation, soil degradation, fish and freshwater scarcity) and short-term natural disasters (e.g., floods, droughts, and the emerging effects of global climate change) pose significant threats to their survival (UNDP 2003, pp. 10, 123-125; UNPD 2002, p. 13 World Bank 2003a, p. 12).

Neo-Malthusians argue that intergroup violence becomes more likely as deprived individuals and social groups engage in increasingly fierce competition over dwindling natural resources and economic opportunities. Deprivation also increases the risk of rebellion against the state by generating a large pool of aggrieved individuals (Homer-Dixon 1991, pp. 104-105, 109-111; and Homer-Dixon 1999, pp. 142-47). Myers, for example, has argued that people impoverished by population growth and environmental degradation “become desperate people, all too ready to challenge governments through . . . guerrilla groups . . .” (Myers 1993, p. 22; see also Ehrlich and Ehrlich 1990, pp. 178-79; and Matthews 1989, pp. 166, 168).

The civil war in El Salvador that began in the late 1970s and raged throughout the 1980s provides an example of these dynamics. Prior to the outbreak of the conflict, decades of rapid population growth had combined with a highly skewed distribution of farmland to produce acute land scarcity, widespread landlessness, substantial migration to marginal ecological areas, and mounting poverty and inequality. Compounding matters further, extensive deforestation, soil erosion, and watershed deterioration had, by the 1980s, undermined food production and hurt the incomes of many poor farmers. As absolute and relative deprivation escalated, so did support for the communist rebellion (Myers 1993, pp. 122-29).

Although early neo-Malthusian conflict claims emphasized absolute and relative deprivation, more recent work acknowledges that deprivation by itself is rarely sufficient to produce large-scale organized violence. The poor often lack the capabilities to rebel, especially in

the context of a strong state. Therefore, neo-Malthusians contend that population and environmental pressures are most likely to contribute to internal wars when these pressures also weaken state authority, thereby opening “political space” for violence to occur (Goldstone 1991; Goldstone 1997; Goldstone 2002; Homer-Dixon 1991; Homer-Dixon 1994; Homer-Dixon 1999; Kahl 2000; Kaplan 1994; Kaplan 1996).

Demographic and environmental pressures can undermine state authority in a number of ways. First, as population and environmental challenges mount, so will the demands placed on the state from suffering segments of the economy and marginalized individuals. Demands may include calls for costly development projects, such as hydroelectric dams, canals, and irrigation systems, subsidies for fertilizer and other agricultural inputs, and urban demands for employment, housing, schools, sanitation, energy, and lower food prices. These demands increase fiscal strains and thus erode a state’s administrative capacity by requiring budgetary trade-offs. A state’s legitimacy may also be cast in doubt if individuals and groups come to blame the government for their plight (Goldstone 1991, chapter 1; Goldstone 1997, p. 108; Homer Dixon 1994, pp. 25-26).

Second, population growth, environmental degradation, and resource depletion can undermine overall economic productivity, thereby reducing the revenue available to local and central governments at the very time that rising demands require greater expenditures (Homer-Dixon 1994, p. 25). Neo-Malthusians do not argue that population growth is universally detrimental to the economy. Nevertheless, in countries with stagnant economies, scarce or costly natural resources, dysfunctional markets, and government policies biased against labor, significant population growth can undermine economic productivity. Population growth tends to lower the ratio of capital to labor and the resulting “capital shallowing” can reduce the per capita economic productivity of a society. Rapid population expansion can also increase dependency ratios and make it more difficult for households to educate and pass on capital to children. By creating large numbers of young people who cannot be educated or productively employed, population growth can undermine the productivity of workers and reduce a country’s ability to compete in the global economy (Cohen 1995; Kelly 1988; Kelley and McGreevey 1994). Higher dependency ratios also force households to shift a greater proportion of financial resources toward basic consumption, limiting their ability to save. In the aggregate, lower domestic savings rates can undermine investments necessary for long-term economic growth or force public and private actors to borrow from abroad, thereby increasing foreign debt (Ahlburg 1994, pp. 136-37; Lee, Mason, and Miller 2001, pp. 137-42; Williamson 2001, pp. 124-28). All told, recent models that disaggregate population growth into several components (i.e., population size and density, as well as changes in mortality and fertility, labor force size, and youth dependency ratios) suggest

that the net effect of rapid population growth on economic progress in developing countries has been negative, at least since the 1980s (Birdsall and Sinding 2001, pp. 9-10; Kelley and Schmidt 2001).⁶

Environmental depletion and degradation can also have serious adverse effects on countries whose economies depend on natural resources. Agriculture continues to account for nearly a quarter of the GDP of low-income countries, and forestry products and fisheries also make large contributions (UNDP 2003, p. 125). Thus, the loss of valuable agricultural land and reductions in crop yields due to soil erosion and desertification, the loss of timber and fuel wood due to deforestation, the collapse of fisheries due to overfishing and pollution, and the loss of hydroelectric power and transportation due to the siltation of rivers and reservoirs can all have damaging economic effects (Homer-Dixon 1991, pp. 94-97).

The communist insurgency in the Philippines demonstrates how the simultaneous strains placed on societies and states can lead to civil strife. An annual population growth rate of around 3 percent, an extremely skewed distribution of arable land, and destructive logging and fishing practices all combined to produce some of the worst deforestation, soil erosion, and coastal degradation in the world. These demographic and environmental pressures worsened poverty and inequality from the late 1960s onward and placed increasing strains on the Philippine state, including escalating demands on the Marcos regime to invest in costly rural and urban infrastructural projects. At the same time, population growth, environmental degradation, and resource inequality ate into domestic savings and undermined economic productivity. This contributed to the debt crisis of the early 1980s, crippling the state's ability to control and service the countryside. As state authority waned and economic insecurity in the countryside grew, poor Filipinos and indigenous communities were driven in ever increasing numbers into the waiting arms of the New Peoples Army (Kahl 2000, chap. 3).

In addition to increasing the risks of rebellion from below, state weakness sometimes encourages political elites themselves to instigate societal warfare in an effort to cling to power. Ethnic clashes in Kenya in the early 1990s illustrate this dynamic. During the 1980s, population growth averaging 3.4 percent a year combined with soil erosion, desertification, and unequal land access to create an extreme scarcity of arable land, escalating economic marginalization in rural areas, and substantial rural-to-urban migration. As the population of Nairobi and Kenya's other urban centers soared, and related social and economic problems worsened, pressure mounted on President Daniel arap Moi's regime to forsake the KANU party's monopoly on rule and allow multi-party elections. In response to this threat, Moi and many of his close associates set out to discredit the democratization process and consolidate their control over the valuable and fertile

Rift Valley by orchestrating a series of tribal clashes that left 1,500 dead and hundreds of thousands homeless. To implement this strategy, KANU elites capitalized on and manipulated a set of demographically-, environmentally-, and historically-rooted land grievances between the Kalenjin, Maasai, and other pastoral groups, and the Kikuyu, Kissii, Luhya, and Luo farming communities that had moved onto traditionally pastoral land during the colonial and post-colonial periods (Kahl 1998; Kahl 2000, chap. 4).

The genocide in Rwanda exhibited similar patterns of state exploitation on a much large scale. In 1992, the internationally sponsored Arusha Accords called on President Juvénal Habyarimana's Hutu regime to open up the government to greater participation by Tutsis. In a bid to maintain control, Hutu extremists organized militias and fomented anti-Tutsi sentiment among Hutus. After the suspicious death of Habyarima in a plane explosion in April 1994, extremists unleashed a wave of violence against Tutsis and moderate Hutus that left hundreds of thousands dead. Population and land pressures in Rwanda were critical to the ability of Hutu elites to execute this vicious campaign. Between 1985 and 1990, Rwanda's annual population growth rate was 3.3 percent, and, prior to the genocide, Rwanda ranked as Africa's most overcrowded nation. These demographic pressures combined with overcultivation and soil erosion to generate an acute scarcity of land, a substantial problem given the predominantly rural nature of Rwanda's economy (Percival and Homer-Dixon 1995). An increasing number of uneducated and underemployed youths began to look for any means of improving their condition. There was thus a large pool of desperate individuals who were susceptible to anti-Tutsi propaganda and easily directed by extremists to kill and drive off their neighbors. As Prunier notes, "[t]he decision to kill was of course made by politicians . . . But at least part of the reason why it was carried out so thoroughly by ordinary rank-and-file peasants . . . was a feeling that there were too many people on too little land, and that with a reduction of their numbers, there would be more for the survivors" (Prunier 1995, p. 4; See also, Ohlsson 1999, chap. 4).

Honey Pots and the Resource Curse

Neoclassical economists advance a set of claims that, on the surface at least, appear to turn neo-Malthusian arguments on their head. Resource abundance, rather than scarcity, is argued to be the bigger threat to political instability.

One claim centers on so-called honey pot effects. According to this view, abundant supplies of valuable local resources create incentives for rebel groups to form and fight to capture them. This can spawn attempts by regional warlords and rebel organizations to cleave off resource rich territories or violently hijack the state. Once seized, control over valuable natural resources fuels conflict escalation by allowing the parties to purchase weaponry and mobilize

potential recruits (Ross 2003, pp. 15-26; Ross 2004). In short, profit-seeking motivates and empowers insurgents in resource-rich countries. As Collier argues, “rebellion occurs only when rebels can do well out of war. . . . Rebellions either have the objective of natural resource predation, or are critically dependent upon natural resource predation in order to pursue other objectives. These, rather than objective grievances, are the risk factors which conflict prevention must reduce if it is to be successful” (Collier 2000, p. 4, 21; see also Collier and Hoeffler 2001; Collier et al. 2003). Echoing these sentiments, de Soysa contends that “greed rather than grievance (at least in terms of the availability of natural resources is concerned) is likelier to generate armed violence” (de Soysa 2000a, p. 26; see also de Soysa 2000b; Le Billon 2001; Ross 1999, pp. 320-21).

The conflicts in Sierra Leone and the Democratic Republic of Congo (the former Zaire) demonstrate the honey-pot effect in action. The Revolutionary United Front (RUF), a group formed by disgruntled Sierra Leone officials and supported by Liberia’s Charles Taylor, invaded Sierra Leone from Liberia in 1991. The RUF was chiefly interested in capturing the country’s mineral wealth. Indeed, their first act was to seize control of the Kono diamond fields and throughout the conflict the RUF sustained its operations with diamond revenues (Klare 2001, pp. 191, 199-202; Renner 2002, pp. 22-26). In the Congo, the attempt by local actors and neighboring armies to profit from the country’s valuable supply of diamonds, gold, copper, coltan, and timber resources was not the initial source of turmoil. Nevertheless, plunder eventually became a powerful contributor to the escalation and endurance of one of the bloodiest wars in recent memory (Renner 2002, pp. 26-31).

Like the deprivation claims advanced by neo-Malthusians, honey pot arguments locate the origin of violence in the incentives of societal actors. By themselves, however, these incentives are not enough to explain violence; strong, capable states should be able to prevent, deter, or repress attempts to seize natural resources before they escalate to all-out war (Collier et al. 2003, pp. 71-71). In other words, like grievance-based clashes, greed-based ones are more likely when states are weak.

Picking up on this basic insight, some neoclassical economists argue that natural resource abundance also produces weak states via a set of developmental pathologies known collectively as the resource curse (Auty 1998; Ross 1999). Economically, abundant natural resources are said to contribute to economic stagnation over the long run through a number of crowd-out effects sometimes referred to as “Dutch Disease.” “The core of the Dutch Disease story is that resource abundance in general or resource booms in particular shift resources away from sectors of the economy that have positive externalities for growth” (Sachs and Warner 1999, p. 48). When

capital and labor focuses on booming natural resource sectors, they are drawn away from other sectors of the economy, increasing their production costs. These economic distortions slow the maturity of non-resource tradable sectors, harm their competitiveness, and thereby inhibit the kinds of economic diversification, especially an early period of labor-intensive manufacturing, which many neoclassical economists suggest is vital for long-term growth (Auty 1998; Auty 2001; Sachs and Warner 1995; Sachs and Warner 1999; Sachs and Warner 2001). It is also argued that over-reliance on exports of minimally processed natural resources makes countries vulnerable to declining terms of trade and the highly volatile nature of international commodities markets. In the absence of a diverse array of exports, especially manufactured goods that tend to have more stable prices, resource-rich countries are prone to dramatic economic shocks when prices for primary commodities inevitably crash (Ross 1999, pp. 301-304).

Beyond the economic distortions created by local resource abundance, there is also a political dimension to the resource curse. The most common political argument focuses on problems associated with “rentier states.” States that accrue a significant amount of revenue from natural resource exports they directly control are prone to developing corrupt, narrowly-based authoritarian or quasi-democratic governing institutions. When states capture enormous rents from natural resources, they face far fewer incentives to bargain away greater economic and political accountability to the populace in exchange for broader rights of taxation (Auty 1998; Auty 2001; Karl 1997; Ross 1999; Ross 2001). Instead, natural resource wealth can be used to maintain rule through patronage networks and outright coercion. The institutional make-up of rentier states therefore reduces the prospects for broad-based, benevolent economic and political reform, weakening the state over the long-term and generating substantial societal grievances. These conditions are ripe for violent revolt (de Soysa 2000a; de Soysa 2000b; Reno 1998; Ross 2003).

There appears to be strong cross-national evidence for the developmental problems associated with the resource curse. Statistical analyses suggest that countries that are highly dependent on primary commodity exports have, on average, lower rates of economic growth and more unequal distributions of income (Sachs and Warner 1995; Sachs and Warner 2001). Underdevelopment and poor governance, in turn, can generate grievances and open political space for organized violence. For example, many oil exporting countries, including Algeria, Angola, Ecuador, Indonesia, Iraq, and Nigeria, have historically been prone to authoritarianism, corruption, periodic social protests, and violence (see, for example, Watts 2001). Recently, some have also expressed fears that Dutch Disease and rentier state pathologies could pose significant threats to the future stability of post-Saddam Iraq. If an equitable system is not established to

manage and distribute the country's oil wealth among the various regions and religious and ethnic communities, it could have a corrupting influence on future political institutions, put any new government's legitimacy at risk, and spur bloody competition between Shiites, Sunnis, Kurds, and Turkmen (Tierney 2003).

Scarcity vs. Abundance

Neo-Malthusians and neoclassical economists seem to advance polar opposite views: the former sees too few natural resources as the problem while the latter sees too many resources as the curse. Thus, while neo-Malthusians would be concerned about the potentially destabilizing effects of demographic, economic, and environmental trends, especially in the world's least developed countries, neoclassical economists might argue that rising demographic and environmental pressures will create incentives for countries to diversify their economies away from natural resource dependence, ultimately making them more prosperous and stable. Upon deeper reflection, however, the arguments advanced are not as incompatible as they first appear.

First, natural resource scarcity and abundance as conceptualized by neo-Malthusians and neoclassical economists are not opposites; they can, and often do, both exist at the same time at different levels of analysis. The vast majority of troublesome resources discussed by neoclassical economists (oil, gemstones, valuable metals, timber, etc.) are abundant locally *but scarce globally*, something neo-Malthusians are careful to point out (Pearce 2002, p. 40). Indeed, it is the global scarcity of these resources that make them so valuable and thus such huge prizes to seize through violence.

Second, abundance can produce scarcity. The extraction and production activities centered around locally abundant (and usually nonrenewable) resources can lead to environmental degradation and scarcities of *other* (usually renewable) resources, and the synergy may lead to violent conflict. In Bougainville, Papua New Guinea (PNG), for example, a local abundance of copper led to huge mining operations, resulting in both disputes over unequal distributions of the revenue and grievances stemming from environmental degradation and scarcity. Copper was discovered on Bougainville in the 1960s and in the 1970s extensive cooperation began between the PNG government and the London-based mining company Rio Tinto Zinc (RTZ). The Panguna copper mine run by the company soon became one of the largest mines in the world. Not surprisingly, the mine became incredibly important to the revenue of the national government, producing 16 percent of PNG's internally generated income and 44 percent of its exports since 1972. Nevertheless, Bougainvilleans grew increasingly resentful of the fact that most mining revenues went to RTZ (80 percent) and the national government (20 percent), and that many of the mining jobs went to workers from other parts of PNG. Compounding

matters, poisonous tailings and chemical pollutants stemming from mining operations destroyed local fisheries, contaminated drinking water, and undermined crop production, threatening the livelihoods of local landowners. When the national government and RTZ ignored Bougainvillean concerns, local landowners started a sabotage campaign against the mine, and the conflict soon escalated to a guerrilla war against troops of the national government (Böge 1992; Klare 195-98; Renner 2002, pp. 9, 44-45).

This type of situation is not unique to Bougainville. In Nigeria, revenue streams from the oil rich Niger Delta have historically filled the coffers of a small minority and propped up a series of repressive regimes. Throughout the 1990s, inequities, environmental degradation, pollution, and health problems stemming from the oil industry generated substantial grievances among local communities in the Niger Delta, including the Ogoni people. In the mid-1990s, the military dictatorship in Nigeria responded to Ogoni protests with repression and the instigation of interethnic violence (Renner 2002, pp. 45-47; Watts 2001).

Finally, abundance and scarcity combine to pose development challenges for resource dependent countries. In many respects, neo-Malthusians and neoclassical economists speak past each other because they ignore the notions of time and sequence that are implicit in their analyses. To see how both logics may operate and actually reinforce one another, consider three idealized temporal stages in a country whose economy is dependent on local supplies of natural resources: (1) initial abundance; (2) emerging scarcity; and (3) the time at which exploitation of the scarce local resource is no longer economically viable, forcing diversification and a search for alternative supplies and substitutes. Neo-Malthusians and neoclassical economists should *both* agree that the second phase holds the highest risk of internal war.⁷

The logic of the honey pot effect, for example, applies much more during a time of emerging scarcity. After all, when natural resources are consumed or degraded at unsustainable rates, their value increases and rival social groups confront greater incentives to seize them. The renewal of civil war in the Sudan in 1983 provides a clear example here. By the end of the 1970s, environmental stress in northern Sudan, stemming in large part from mechanized farming, increased the value of water, land, and oil resources in the south. Northern elites, acting in support of allied northern mechanized farm owners, pushed south to capture these resources. This posed an enormous threat to the economic and physical survival of southerners, encouraging them to restart the war against the north. As the war raged on, oil exports became central to the north's ability to finance its campaign, encouraging it to seize and exploit oil deposits deeper and deeper into the south (Renner 2002, pp. 10 ; Sulliman 1992; Sulliman 1993). More generally, Klare's research on contemporary resource clashes in Angola, Indonesian and Malaysian regions of

Borneo, the Democratic Republic of Congo, Sierra Leone, and elsewhere finds that rising global demand and scarcity-driven price increases provide additional incentives for contending social groups and elites to capture control of valuable mines, oil fields, and timber stands, by force if necessary (Klare 2001, pp. 20-21, chap. 8).

If development is viewed as a sequence of temporal stages, a good case can also be made that the developmental pathologies of the resource curse and those emerging from rapid population growth, environmental degradation, and resource scarcity can all occur and interact with one another within the same country over time. During stage 1, when resources are abundant, a country may become highly dependent on these resources, and elements of Dutch Disease and rentier state politics may take hold. Then, during stage 2, demographic and environmental pressures may produce growing scarcities and undermine economic and political stability *precisely because* the country developed such a strong dependence on exporting natural resources in the first place. Finally, at stage 3, scarcity and economic crisis may force the government and the private sector to promote diversification as a means of resuscitating growth. This hypothetical sequence suggests that neoclassical theorists tend to focus on the logic involved in the leaps between these temporal stages without sufficiently recognizing the risks of transitional violence during the middle stage emphasized by neo-Malthusians.

By ignoring transitional dangers, neoclassical economists miss important contributors to civil strife. The experience of the world's poorest countries suggests that many are currently stuck in stage 2, where high dependence on natural resources, rapid population growth, environmental degradation, and emerging scarcity conspire to threaten political stability. Recent reports by both the UN Development Programme (UNDP) and the World Bank suggest that the least developed countries tend to be those that are most dependent on minerals, agriculture, forestry, fish and other natural resources (UNDP 2003, p. 123; World Bank 2003a, p. 119). Unfortunately, as the UNDP notes,

slow world market growth, unchanging technologies and often volatile and declining world prices for these commodities offer much too narrow a base for economic advance. Continued heavy dependence on a handful of primary commodity exports provides no chance of long-term success. This unfortunate situation afflicts much of Sub-Saharan Africa, the Andean region and Central Asia.

Exacerbating these structural problems is rapid population growth, which tends to be fastest in countries with the lowest human development. These challenges can seriously hinder the availability of farmland and increase

environmental degradation (deforestation, soil degradation, fisheries depletion, reduced freshwater) (UNDP 2003, p. 17; see also p. 123).

Different Resources, Different Risks

Different types of natural resources are likely to be implicated in different types of conflict. In fact, a close look at the conflict claims advanced by neo-Malthusians and neoclassical economists reveals that they are generally not talking about the same resources. Unlike the across-the-board warnings of their predecessors, contemporary neo-Malthusians primarily write of the dangers inherent in the degradation and depletion of renewable resources. In contrast, the logic of the neoclassical honey pot and resource curse claims apply primarily to nonrenewable mineral resources (with the partial exception of timber).

The broad grievance-based scenarios identified by neo-Malthusians are most likely when international demand, local population dynamics, unsustainable extraction practices, and unequal resource access interact to produce environmental degradation and emerging scarcities of renewable resources. Agriculture, forestry, and fishing contribute much more to employment than capital-intensive nonrenewable resource sectors. Moreover, access to arable land (or inexpensive food) and freshwater is vital to extremely poor individuals throughout the developing world. Degradation, depletion, and/or maldistributions of these resources can therefore directly implicate the survival of large numbers of people in rural areas in ways that nonrenewables usually do not. Of course, in some instances, the extraction of nonrenewable resources causes degradation, depletion, or unequal distributions of renewable ones (as the example of Bougainville suggests), but even here it is the impact on the surrounding renewable resource base that is likely to have the widest direct effect on the quality of life and related grievances.

Nonrenewable resources are much more likely to be implicated in the conflict scenarios outlined by neoclassical economists. Nonrenewable resources are likely to be central to violent conflicts in which natural resources themselves are the main prize to be captured, as opposed to conflicts emanating from the more diffuse social and economic effects of environmental degradation and renewable resource scarcity. According to the honey pot logic, the incentive and capability to capture nonrenewable resources is especially high because mineral resources tend to be much more valuable per unit of volume, geographically concentrated, and easily tradable than most renewable resources. These features make nonrenewable resources considerably more “lootable” (Le Billon 2001, pp. 569-70). It should come as no surprise, therefore, that the vast majority of honey pot-driven conflicts revolve around oil, diamonds and other valuable minerals (de Soysa 2000a, pp. 9-10; Ross forthcoming).

Economic and political components of the resource curse also apply much more to countries dependent on the export of nonrenewable resources. Here, several characteristics distinguish mineral-dependent economies and polities from countries dependent on renewables (again, with the partial exception of timber). Mineral countries tend to be economically dependent on a single resource. Consequently, their economies tend to be especially sensitive to price volatility (Karl 1997, pp. 47-48). Furthermore, mining countries are typically dependent on resources that generate extraordinary rents. This is especially true of oil, but is also the case with other minerals. As Sachs and Warner note, “we should distinguish minerals (which generally have high rents) from agriculture (which generally has low rents). In the same vein, perhaps processed agriculture should be distinguished from primary agriculture” (Sachs and Warner 2001, p. 831).

States in the developing world also exercise sole ownership rights over subsoil assets and, often, public forestlands. This means that export revenue from these resources is not mediated through domestic private actors, but instead accrues directly to the state and allied firms. This differs dramatically from the situation in most countries dependent on exports of agriculture since these resources tend to be privately owned (even if sometimes highly concentrated). Thus, since government officials have the ability to extract and control unusually high-income from nonrenewables, the pathologies of rentier state politics are likely to be much more acute than in countries dependent on most renewable resources (Auty 1998, p. 1; Karl 1997, pp. 15, 48-49, 52, 56-57; Ross 1999, pp. 311, 319-320).

The Importance of the State and Political Institutions

Demographic and environmental pressures are rarely if ever sufficient to produce conflict; there are many countries that experience these pressures yet avoid civil strife. Neo-Malthusians and neoclassical economists generally agree that demographically- and environmentally-induced civil wars are most likely in countries with weak governments and authoritarian political institutions.

As noted above, strong states are typically able to prevent, deter, or repress large-scale organized violence initiated by potential challengers. Strong states are also less vulnerable to conflicts initiated by state elites themselves because elites generally feel more secure and are able to advance their interests without risking society-wide warfare. State weakness, in contrast, makes the government vulnerable. This increases the prospects of rebellion and secession stemming from societal grievances and/or the predatory motivations of rebel organizations and regional warlords. A sense of insecurity may also tempt political leaders to instigate widespread

intergroup violence as a desperate means of diverting attention, crushing opponents, rallying supporters, and holding on to power (Kahl 1998; Kahl 2000, chap. 2).

Beyond the strength of the state, the character of the state's governing institutions also matters. Consolidated democracies are unlikely candidates for civil war and are less vulnerable to widespread upheaval during times of crisis. Democracies normally enjoy greater system legitimacy than authoritarian states and are better able to channel grievances into the normal political process. Democratic institutions also increase the transparency of political decisions and place constraints on executive authority, limiting the ability of state elites to instigate violence (Kahl 1998, pp. 90-91; Kahl 2000, pp. 75-80).

Quantitative studies suggest that many consolidated authoritarian states also avoid civil wars. Nevertheless, their stability typically relies on a high degree of coercive power and patronage, and these governments often generate substantial antistate grievances, especially among excluded social groups. Consequently, these states are vulnerable to rapid collapse and civil war during times of crisis or regime transition (Goldstone et al. 2000, pp. 14-16)

All told, when the strength of the state and the character of its political institutions are taken into consideration, it becomes clear that some political contexts are especially vulnerable to demographically- and environmentally-induced violence. The natural resource-civil war connection is likely to be particularly tight when population growth, environmental degradation, resource scarcity, and/or the pathologies of the resource curse contribute to state weakness and authoritarian institutions, or when demographically- and environmentally-induced grievances and honey pot effects occur in the context of states that are already weak and narrow or undergoing rapid regime transition.

Implications for the Future

Over the next half century, the UN medium projection estimates that the world population will increase from 6.3 billion in 2003 to 8.9 billion in 2050 (UNPD 2003). Population growth is projected to slow across the board, but differential growth rates between rich and poor countries are expected to persist. Indeed, by 2050 the population of the high-income countries is expected to be in the midst of a twenty-year population *decline*. In contrast, the population of developing countries is projected to increase from 4.9 billion in 2003 to 7.7 billion in 2050; over the same period, the population of the least developed countries is projected to more than double from 668 million to 1.7 billion (UNPD 2003: vi-viii, 1-9).

Economic growth and consumption are also projected to increase in the decades ahead, spurred on by continued economic globalization. The World Bank projects growth in global income of 3 percent per year over the next 50 years, suggesting a fourfold rise in global GDP (to

a total of \$140 trillion) by mid-century. Historically, higher income is associated with higher levels of consumption. Consequently strains on the environment are likely to accelerate “if there is too little attention to shifting consumption and production patterns” (World Bank 2003b, p. 4).

Although it is impossible to predict the future of any complex system, let alone a future based on the intersection of several complex systems (demographic, economic, political, and environmental), some have offered possible scenarios. Combining UN population growth estimates, Intergovernmental Panel on Climate Change (IPCC) estimates on future carbon dioxide emissions, and UN Food and Agriculture Organization (FAO) estimates regarding trends in the consumption of agriculture products (crops, meat, and dairy), forest products (including fuelwood), and fish and seafood, the WWF has projected humanities ecological footprint forward from 2000 to 2050.

Based on the UN, IPCC, and FAO reference scenarios, which assume slowed population growth, steady economic development, and more resource-efficient technologies, the world’s ecological footprint will continue to grow from 20 per cent above the Earth’s biological capacity to a level between 80 and 120 per cent above it. In these scenarios, 9 billion people would require between 1.8 and 2.2 Earth-sized planets in order to sustain their consumption of crops, meat, fish, and wood, and to hold CO₂ levels constant in the atmosphere (WWF 2002, p. 20).

Whether this scenario comes about obviously depends on future consumption habits and available technology. Rapid advances in technology that provide for significant improvements in resource efficiency, for example, could allow for long-term sustainability and continued advances in human welfare; however, without significant technological changes, projected consumption would become unsustainable (WWF 2002, p. 20).

Consumption will likely drive global patterns of resource depletion and pollution, but population growth and poverty will continue to have an important impact at the local level. Even as globalization raises the living standards of some countries and peoples, pockets of extreme poverty and yawning inequalities are likely to persist, placing their own strains on the environment. Current projections suggest that millions of people in the developing world will continue to rely on overcrowded and ecologically fragile lands where there is a real danger of becoming trapped in a vicious cycle of poverty and environmental decline. This is likely to generate substantial challenges for both human welfare and political stability.

Other dangers emerge from the opportunities globalization provides to profit from the control over, and exploitation of, valuable natural resources. As Klare notes,

The increasing vigor of globalization has . . . contributed to the persistence of resource contests in the developing world. With industrialization spreading to more countries than ever before, the worldwide demand for many basic materials—including minerals, gems, and timber—is growing rapidly, thereby increasing the monetary value of many once-neglected sources of supply. . . .

Globalization has also expanded the roster of corporations with both the means and the incentive to procure resources from remote and undeveloped areas—even if this means dealing with warlords and/or transporting valuable commodities through areas of conflict (Klare 2001, pp. 194-95; See also Renner 2002, p. 21).

It should be remembered, however, that none of these demographic and environmental changes will take place in a political vacuum. In this regard, the continued spread of democracy (the political side of globalization) is cause for both hope and concern. Hope springs from the prospect of greater democratic consolidation and the potential for both long-term stability and justice that such consolidation may bring about. However, it is also well documented that the transition to democracy is fraught with difficulties. Sudden democratization puts the political rules of the game up for grabs, potentially threatening existing powerholders and their allies, and may produce substantial increases in political participation prior to the solidification of institutions capable of accommodating new demands. As a consequence, some democratizing states experience periods of turmoil, violence, and backsliding to authoritarianism (Goldstone et al. 2000, pp. 14-16; Snyder 1999; Zakaria 2003).

Severing the natural resources-civil war connection requires a series of behavioral and policy changes. High-income countries must commit to reducing their unsustainable consumption and pollution habits by altering lifestyles, developing cleaner and more efficient technologies, and assisting developing countries in gaining access to these technologies. Steps must also be taken to ensure non-coercive reductions in population growth. To achieve projected declines in fertility rates, more needs to be done to ensure that individuals in developing countries have greater access to family planning, public health services, and educational opportunities, especially for young girls and women.⁸ To mitigate the destabilizing consequences of natural resource dependence, developing countries should be encouraged to diversify their economies by promoting sectors that do not rely primarily on a handful of primary commodities but are still labor intensive. Greater efforts must also be made to provide a more equitable distribution of essential renewable resources, especially land, for those who remain dependent on the environment for their livelihood. Finally, the international community must move beyond the mere promotion of democracy to ensuring that democratic transitions, once started, actually bring

about responsive governing institutions. None of these steps are easy, but they are necessary if the international community is to come to grips with one of the greatest security challenges of the early twenty-first century.

¹ A third approach, political ecology, informs the discussion in this chapter but it is not reviewed in detail. Political ecology offers a radical critique of neo-Malthusianism and neoclassical economics that draws insights from Marxian theory and postmodernism. Specifically, political ecologists study the way in which international and local political, economic, social, and cultural processes constitute resources as “valuable” and distribute them in certain ways. To the extent that they discuss the natural resources-civil war connection, the political economy of resource access and control, rather than population growth or natural scarcity, are viewed as central. Political ecologists argue that strife can emerge from attempts by powerful actors to seize and exploit valuable natural resources and/or from violent acts of resistance on the part of oppressed groups. For a general introduction see Bryant and Bailey 1997; Peet and Watts 1997; Watts 2000. For analyses of the natural resources-violence connection, see Dalby 2002; Le Billon 2001; Peluso and Watts 2001; Sulliman 1999. For critiques of this literature, see Kahl 2002; Vayda and Walters 1999.

² Renewable resources are natural resources that *theoretically* regenerate themselves indefinitely through normal ecological processes. They can become scarce, however, if they are qualitatively degraded and/or quantitatively depleted at unsustainable rates. In contrast to renewable resources, nonrenewable resources do not regenerate in time scales that are relevant to human beings, making them for all intents and purposes finite.

³ Of these 54, 20 were in Sub-Saharan Africa, 17 in Eastern Europe and the former Soviet Union, 6 in Latin America and the Caribbean, 6 in East Asia and the Pacific, and 5 in the Middle East (UNDP 2003, p. 3).

⁴ Neoclassical economists generally have faith in the power of markets and social institutions to head off resource scarcities before they become too acute. The basic economic logic underlying this claim is straightforward: rising prices stemming from increased demand for, or decreased supply of, natural resources forces individuals, firms, and societies to adapt by diversifying, developing cheaper substitutes, deploying conservation methods, and utilizing more efficient means of extraction. Classics in this tradition include, Boserup 1965; Simon 1981; Simon and Kahn 1984; and Simon 1992. Although these claims have substantial merit, neoclassical economists tend to be overly optimistic about the prospects for adaptation. Markets and institutions have frequently adapted to population and environmental pressures at the global level and within wealthy industrialized countries, but serious local scarcities, especially of renewable resources, continue to emerge within developing countries for a number of reasons. First, in many developing countries, the markets, property rights, government policies, judicial (contract-enforcing) institutions, basic infrastructure, research facilities, extension services, and human capital required to transform price signals into adaptation are imperfect, absent altogether, or distorted in ways that actually compound resource problems. Second, critical renewable resources such as arable land and freshwater often lack cheap substitutes or easy tech-fixes. This leaves conservation as the major adaptation mechanism. Unfortunately, the economic practices and poverty that drive many environmental pressures in the first place also tend to undermine the capacity of individuals and governments to make timely and expensive investments in conservation. Finally, neoclassical economists tend to underrate the degree to which environmental systems become stressed in non-linear, rapid, and irreversible ways, producing sudden surprises and scarcities that are difficult to respond to, at least in the short-term. Therefore, adaptation, even if it eventually occurs, may be too late to head-off significant

transitional difficulties and conflicts. See Ahlburg 1998; Homer-Dixon 1995; and Homer-Dixon 1999, chap. 3.

⁵ This figure includes 518 million in arid regions with no access to irrigation systems; 430 million on land with soils unsuitable for agriculture; 216 million in slope-dominated regions; and more than 130 million in fragile forest ecosystems (World Bank 2003b, p. 60).

⁶ Neoclassical economists contest the connection between population growth and economic decline. The positive effects emerging from economies of scale, larger labor forces, and induced innovation and technological change are argued to balance out the negative effects of capital shallowing, higher dependency ratios, and environmental degradation. Moreover, neoclassical economists argue that government policies are much more important than population growth in determining prospects for economic development. Unfortunately, in of the world's least developed countries, government policies have encouraged capital-intensive industries that underutilize abundant supplies of labor. Governments have also adopted other policies ill suited for labor-intensive agricultural sectors, such as high taxes on farm inputs and outputs. Compounding matters, economic policies have tended to overemphasize urban areas at the expense of investments in rural development. Thus, development strategies have often been incompatible with the promotion of economic growth in an environment of rapid population growth. Moreover, "[w]hile it can be demonstrated that 'population problems' are largely due to inappropriate government policies, it is also clear that, *given* these policies, population growth can exert a stronger adverse impact." (Kelley 2001, pp. 42-43, emphasis in original). This all suggests that the effects of population growth are likely to vary from context to context. In some cases, the effects may be negligible or even positive. But in other cases, the effects are likely to be negative, sometimes profoundly so. For excellent reviews of the debate over the economic consequences of population growth, see Kelley 2001; and Kelly and Schmidt 2001.

⁷ Some may object by pointing to the statistical evidence presented by Collier et al. and Sachs and Warner that, according to the authors, suggests that stage 1 is the most dangerous period. However, both Collier et al. and Sachs and Warner measure abundance by calculating primary commodity exports as a percentage of GDP. Ultimately, this is measure of resource dependence, not of abundance. In and of itself, the measure says nothing about resource endowments or changes in those endowments over time. Thus, it is perfectly conceivable that resource dependent countries face higher risks in general, but that risks escalate during stage 2 when scarcities begin to emerge but before the country is forced to break its dependence. For a similar argument, see de Soysa 2000a, p. 11.

⁸ Absent this access, there is the potential for considerably greater population growth. If fertility rates were to remain at their current levels, for example, the estimated world population in 2050 would balloon to 12.8 billion. And even if women were to have, on average, only about half a child more than the current medium projection assumes, world population could increase to 10.6 billion in 2050 (UNPD 2003, p. vi).