ENVIRONMENTAL IMPACTS OF DEVELOPMENT PRACTICES OF THE WORLD BANK

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ABSTRACT

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Some of the most ecologically diverse and threatened areas of the world are within developing nations. This thesis will provide an historical and economic context for environmental problems that currently characterize the developing world. There is an intimate connection between world trade and economic development across nations. Habitat destruction in biodiversity hotspots, as well as world population growth, hinges on the problems of underdevelopment and globalization. Citizens of the First World often lament decisions made by the Third World without a proper understanding of how rich nations are complicit by virtue of their terms of trade and conditionality requirements through Bretton Woods institutions such as the World Bank and International Monetary Fund. Since the late 1980s, the World Bank has attempted to be more environmentally savvy; however, there is little research assessing the Bank's ability to change. The World Bank has attempted to rectify this legacy with new money-lending practices such as the Global Environment Facility. The likelihood for the success of these changes will be assessed. Major sources of data include the Conservation International web portal for hotspots, *Biodiversity Hotspots*; publications, internal papers, and websites of the World Bank; *The World Bank: Its First Half Century* by Kapur et al.; and *A New Green Order?* by Young. Major findings include a statistically significant relationship between economic status and the presence of biodiversity hotspots, as well as selective targeting of the stages of economic development outlined in W.W. Rostow's *The Stages of Economic Development* by Bretton Woods institutions.

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LIST OF ABBREVIATIONS AND ACRONYMS

CBD	(United Nations) Convention on Biological Diversity
COP	Conference of Parties
DRS	Debtor Reporting System
DS	Debt Service
EIA	Environmental Impact Assessment
G-77	Group of 77 Countries
GATT	General Agreement on Tariffs and Trade
GDP	Gross Domestic Product
GEF	Global Environment Facility
GNI	Gross National Income
GNP	Gross National Product
HIPC	Heavily Indebted Poor Countries
IBRD	International Bank for Reconstruction and Development
ICSID	International Center for Settlement of Investment Disputes
IDA	International Development Association
IEPP	Independent Evaluation of the Pilot Phase
IFC	International Finance Corporation
IMF	International Monetary Fund
IPAT	Imapct (environmental) = Population * Affluence * Technology
LDCs	Least Developed Countries
MIGA	Multilateral Investment Guarantee Agency
NAM	Non-Aligned Movement
NATO	North Atlantic Treaty Organization
NGO	Non-governmental Organization
OPEC	Organization of the Petroleum Exporting Countries
PRINCE	PRogram for measuring the INcremental Costs for the Environment
PRSPs	Poverty Reduction Strategy Papers
PVDS	Present Value of Debt Service
QAG	Quality Assurance Group
SAP	Structural Adjustment Program
STAP	Scientific and Technical Advisory Panel
UN	United Nations
UNCBD	United Nations Convention on Biological Diversity
UNDP	United Nations Development Program
UNEP	United Nations Environment Program
UNFCC	United Nations Framework on Climate Change
UNICEF	United Nations Children's Fund
USAID	United States Agency for International Development
WEOG	Western European and Others Group
WWF	World Wildlife Fund

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1 Chapter 1: Introduction

1.1 Overview

Biologist E.O. Wilson notes that there are only two major categories of environmental problems: Those that alter the physical environment, making it uncongenial to life, and those that cause the irrevocable loss of genetic and biological diversity. Because the latter encompasses losses that cannot be redeemed, the loss of biodiversity is an environmental crisis characteristically different from other types of environmental degradation.[1] Though both categories of environmental problems demand attention, the second is arguably more urgent to address as species slip away.

Some of the most ecologically diverse and threatened areas of the world are within developing nations. Citizens of industrialized countries often assume that the environmental destruction occurring in poorer nations is due to a lack of appreciation or poor education on the part of locals. Though substandard housing, schools, and infrastructure are often a reality in the developing world, to assume that dilapidated conditions alone give rise to environmental degradation considers only part of a much larger and more complex picture. By looking specifically at the institutions which have a hand in development – namely the World Bank – and their governing philosophies relating to development, trade, and the roles they should play, this thesis will provide an historical and economic context for environmental problems that currently characterize the global South.

The research hypothesis of this thesis contains three arguments. First, biodiversity loss negatively impacts human societies in significant ways – by destabilizing ecological services and dwindling medicinal, nutritional, and cultural resources. This argument is discussed in *Chapter 4: Impacts and Mechanisms of Accelerated Biodiversity Loss*. Second, these losses are most pronounced in least developed economies, so much so that there is a likely link between these losses and the business of how international development has been practiced. This argument is discussed in *Chapter 5: Links Between Biodiversity Hot Spots and International Development*, and *Chapter 6: A Critical Look at One of the World Bank's Reinventions: The Global Environment Facility*. Third, though many stakeholders believe that international development ought to be conducted in a different way, leading institutions such as the World Bank face significant challenges to institute change. These challenges are both philosophical and institutional as explored in *Chapter 3: Rostovian Development Theory*, and *Chapter 2: A Brief History of The World Bank and International Development*.

These three arguments could be encompassed in the question, "Can institutional changes in the World Bank with respect to development practices slow or eventually stop destruction of biodiversity hotspots?" This question is inspired by two claims advanced by E.O. Wilson in his book, *The Diversity of Life*. Writing about possible solutions to the biodiversity crisis, Wilson first states,

> Today the poorest countries are rapidly decapitalizing their natural resources and unintentionally wiping out much of their biodiversity in a scramble to meet foreign debts and raise the standard of living. By perceived necessity they follow environmentally destructive policies that yield the largest short-term profits.[2]

A few pages later, Wilson writes,

> The richest countries set the rules for international trade. They provide the bulk of loans and direct aid and control technology transfer to the poor nations. It is their responsibility to use this power wisely, in a manner that both strengthens these trading partners and protects the global environment.[3]

1.2 Methodology

A number of suppositions must be explored to determine if Wilson's observations are accurate and hence to answer the research hypothesis. First where is biodiversity most rapidly being decapitalized? Biodiversity hotspots are selected as a point of focus because they are regions that top the priority list of conservation efforts. Recognized as having the highest concentrations of both species endemism and habitat destruction, hotspots are naturally a focus for any discussion regarding loss of biodiversity. Hotspot data was collected from Conservation International's *Biodiversity Hotspots* website. A catalog of 129 countries and territories housing hotspots was constructed from maps and geographic descriptions of the 34 hotspots identified by Conservation International in February of 2005.

Second what is the economic status of these countries? This will be investigated by consulting income and indebtedness classifications for the 129 aforementioned economies, where applicable, retrieved from the World Bank's Data and Statistics website.

Third, does the income status, debt status, or both of a nation really have a bearing on habitat destruction? This will be investigated with a Pearson chi-

square statistical test on the data collected from Conservation International and the World Bank.

Fourth, are rich countries really in a position to "set the rules" of international trade such that they protect biodiversity, or are trends in international trade subject to a more chaotic process determined by history and the political-economic jockeying of multiple players? This will be investigated through literature review. Organizations that are considered catalysts for the development of the world economy are the Bretton Woods institutions of the World Bank and the International Monetary Fund (IMF). Though industrialized donor economies wield tremendous influence as well, this influence is typically channeled through one of the aforementioned entities. It is for this reason that the Bretton Woods institutions take center stage in this thesis. Since the IMF is considered a lender of last resort, the World Bank has been much more involved in development projects of all types. Thus the World Bank is the institution explored in detail in this study.

Another reason the World Bank is the organization of focus in this study is that it is has been the poster-child for the funding and sanctioning of international development efforts. The World Bank is also the primary multilateral institution that classifies world economies with respect to income level and indebtedness. Through a review of the institutional history of The World Bank, and of literature published by both The World Bank and its critics, this thesis will uncover both

the institutional structure of The World Bank and its philosophical rationale for its approach to international development.

Though colonialism from a far earlier time undoubtedly played a role in influencing trade relationships, development priorities, and biodiversity loss, this study focuses on the role of recent development activity. It also narrows its focus to that time period after the inception of the World Bank following World War II. Additionally this thesis introduces the intimate connection between world trade and international development as discussed by W.W. Rostow in *Chapter 3: Rostovian Development Theory.* Consequently environmental problems such as habitat destruction in biodiversity hotspots, as well as world population growth, hinge not only on the problem of international development, but also on globalization.[4]

Citizens of the First World often criticize environmental management decisions in the Third World without a proper understanding of the ways in which rich nations are complicit. Complicity is generated primarily on two fronts: First, demand for inexpensive goods and services by rich consumers in the First World encourage environmentally destructive practices such as mining, clear cutting, and over-harvesting in the developing world. Second, monetary policies, such as the IMF's structural adjustment programs (SAPs), designed by financiers in the North to maintain the international monetary system and combat poverty in the South, have been documented as drivers of environmental degradation. Sensitive to these findings, the World Bank has attempted to be more

environmentally savvy in its most recent macroeconomic restructuring programs such as Poverty Reduction Strategy Papers (PRSPs). PRSPs are penned by development experts from developing countries; however, there is little evidence that shows these types of reinventions to be substantial.

1.3 Origins of The World Bank

The World Bank was conceived in 1944 during a conference of world delegates in Bretton Woods, New Hampshire near the end of World War II. The conference's primary aim was to assemble international economic safeguards to prevent another world war.[5] Prior to World War II, depressed economies worldwide spurred massive unemployment and political unrest. Conference attendees hoped that designing proper international supports could stave off future global depressions that would again lead to global war. Here the roots of globalization were planted.

Arguably the "star" proposals Bretton Woods delegates discussed were the IMF and the General Agreement on Tariffs and Trade (GATT). The chief architects were American economist Harry Dexter White and British economist John Maynard Keynes. The IMF would oversee a system of fixed exchange rates, promote currency convertibility, and serve as a "lender of last resort" for countries with balance of payments problems – potentially saving them from depression. The GATT set rules for global trade that aimed to reduce trade barriers over time. In order to make good on the GATT, however, the war-torn economies of

Europe had to be rebuilt. Thus the World Bank, then called the International Bank for Reconstruction and Development (IBRD), was born to rebuild Europe.[6]

In sum, Bretton Woods was a system of rules, institutions, and procedures that were instituted to regulate the world economy. The chief features of the Bretton Woods system were, first, an obligation for each country to adopt a monetary policy that maintained the exchange rate of its currency within a fixed value in terms of gold; and, second, the acceptance of macroeconomic provisions by the IMF to gain funds that would bridge any temporary payments imbalances. Until the early 1970s, the Bretton Woods system was effective in controlling conflict and in achieving the common goals of the leading states that had created it – especially the United States and Europe. In the face of increasing economic strain during the 20th century, however, the system eventually collapsed in 1971 following the United States' suspension of convertibility from dollars to gold.

During the 1980s and 1990s, key Bretton Woods institutions – especially the World Bank and the IMF – came under heavy criticism for the high social and environmental tolls paid by developing nations in the name of their balance-of-payments. Since the 1990s, the World Bank has attempted to rectify its negative humanitarian and environmental legacy with new money-lending practices such as the Global Environment Facility (GEF), a special program designed to support projects commensurate with the goals of United Nations (UN) conventions on biodiversity and climate change.

As will be shown, significant relationships exist between economic classifications and hotspot status. This implies that changes in development practices at The World Bank may, in fact, be able to play a great role in slowing, stopping, or even reversing economic trends that have influenced land use decisions leading to serious habitat destruction and biodiversity loss. At the end of this thesis, the likelihood for the success of these changes will be briefly discussed in the context of the larger global economic framework.

2 Chapter 2: A Brief History of The World Bank and International Development

To understand why the World Bank, international development efforts, and international trade could be assigned some level of culpability for habitat destruction, one must understand some history. This chapter is organized into five sections. The first section, *Current Structure of The World Bank*, describes the five institutions of the World Bank Group and introduces the reader to the World Bank's decision-making structure. The second section, *Early History, 1945 - 1950s: Reconstruction and the Beginning of the Cold War*, explains the role of the Bank during its first 15 years of existence. The third section, *Middle History, 1960s - 1980s: The Rise and Fall of the Developing World*, details how industrialized and developing countries viewed international development efforts before the Energy Crisis and structural adjustment programs. The fourth section, *Late History, 1980s - Present: The World Bank Attempts to Reinvent Itself*, recounts how the Bank has tried to be more responsive to social justice and environmental critics. Concluding thoughts comprise the last section.

It is important to remember that from the outset, the World Bank functioned as the "development" arm of a larger, international monetary stabilizing mechanism - the Bretton Woods system. Such a dual role was bound to create some tension, as the Bank must champion causes for the neediest segments of the world while it is also designed to serve the wealthiest.[7] Despite the Bank's most recent transformations to increase its social and environmental accountability, its

dual role – and the tension that comes with it – continues to this day.

2.1 Current Structure of The World Bank[8]

The World Bank is comprised of two institutions: the International Bank for Reconstruction and Development (IBRD) and the International Development Association (IDA).[9] The IBRD lends money to governments that are considered creditworthy. Though low-income countries can be deemed credit worthy, the IBRD typically lends to middle-income countries. The IDA works exclusively with poor countries granting them interest-free loans that are referred to as credits. Unlike the IBRD, funds for disbursement through IDA are approved every three years by the governments of rich, donor countries.[10] Though some see this approval process as an accountability mechanism, others see politicization of international development. This is a valid concern, since unlike other international bodies such as the United Nations, where each country has an ambassador and five permanent Security Council members have veto power, voting power in the World Bank is determined by the percentage of shares each member country holds in the Bank. In both the IBRD and IDA, the US holds the largest amount of shares and thus the US executive director wields the greatest amount of voting power at 16.41% and 13.9% respectively. Japan's executive director comes second with 7.87% and 10.92%. Only eight of the member countries have direct representation on the Board of Executive Directors: the US, Japan, Germany, France, the United Kingdom, China, Saudi Arabia, and Russia.

Sixteen executive directors represent constituencies of the remaining 156-176 member countries.

The Board of Executive Directors is comprised of 24 executive directors with the Bank president, who has always been an American, as chairman.[11] Executive directors make regular decisions for the Bank; however, once a year during the World Bank Group - International Monetary Fund Annual Meeting, all member countries are represented by their own ministerial representatives who are called Governors. The Bank aims to be accountable to its member countries through its Board of Governors, as the Board of Executive Directors is, in theory, beholden to the Board of Governors. The Bank hierarchy is shown in Figure 1.

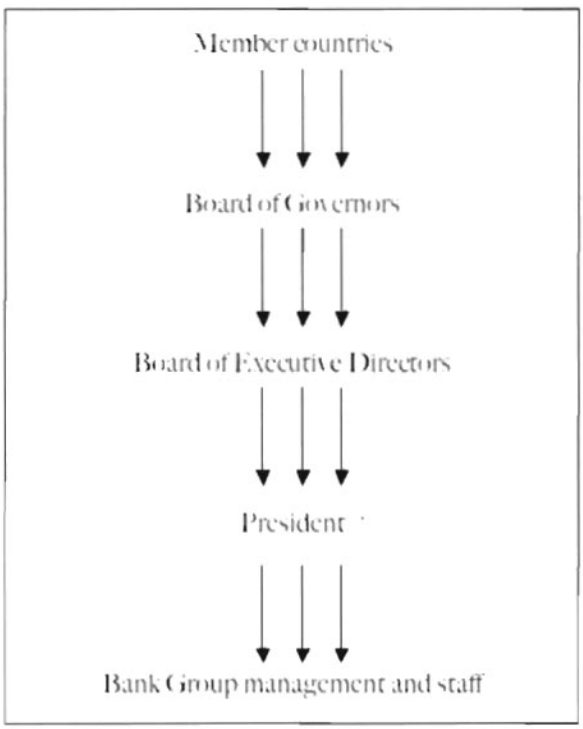

Figure 1. Relationship schematic of member countries and the World Bank Group. Reproduced from The World Bank, *A Guide to The World Bank*, 8.

Executive directors are responsible for policy decisions affecting the Bank Group's operation and the approval of all loans. They normally meet twice a week

to oversee Bank Group business. Voting power by region[12] is shown below in Figure 2 and Figure 3. As can be seen in the graphs, the number of votes each director has at his disposal is not equal. Europe (excluding the Russian Federation) and North America together control over half the votes in both the IBRD and the IDA.

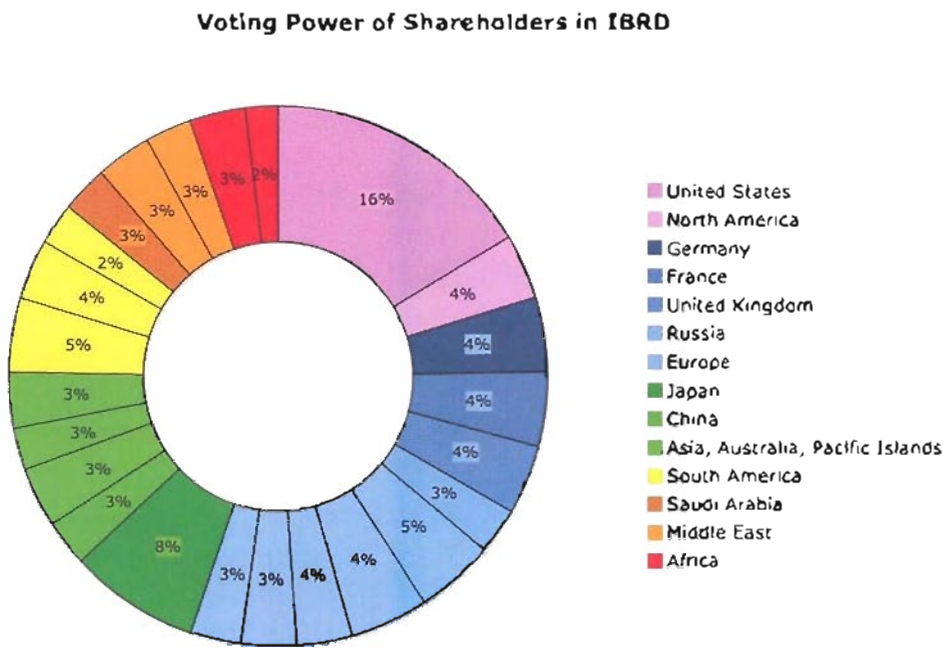

Figure 2. Voting power of the 184 shareholder countries in the IBRD, 2003.[13] Each sliver of the chart represents the voting power of each IBRD executive director. Voting power is colored by region, and shaded slivers represent executive directors that cast votes for only one country.

Though it is only the IBRD and IDA that technically make up the World Bank, three other organizations, together with the IBRD and IDA, make up the World Bank Group. These other sister organizations are the International Finance Corporation (IFC), the International Center for Settlement of

Investment Disputes (ICSID), and the Multilateral Investment Guarantee Agency (MIGA).

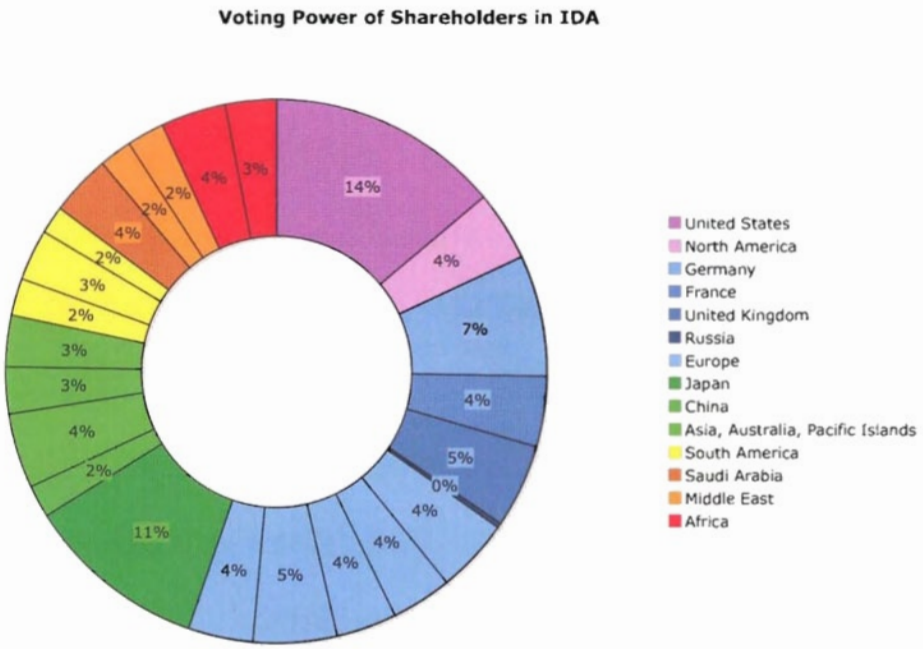

Figure 3. Voting power of the 164 shareholder countries in the IDA, 2003.[14] Countries and constituencies are listed in the same order as Figure 4. Each sliver of the chart represents the voting power of each IDA executive director. Voting power is colored by region, and shaded slivers represent executive directors that cast votes for only one country. The Russian Federation controls 0.28% of IDA votes.

Unlike the World Bank, which must lend to governments, the IFC directly finances businesses and initiatives undertaken by the private sector in developing countries. In keeping with Rostovian development theory, which will be discussed in chapter 3, the IFC's particular focus

> ...is to promote economic development by encouraging the growth of private enterprises and efficient capital markets in its member countries.... IFC also advises governments in developing countries on how to create an enabling business environment, and it provides guidance on attracting foreign direct investment.[15]

The ICSID is considered an autonomous international organization, but its Secretariat is financed through the World Bank. It provides international facilities for conciliation and arbitration of investment disputes between states and foreign investors. It also conducts research and publishes scholarly work on arbitration and foreign investment law.

MIGA underwrites overseas investors' noncommercial risks such as expropriation, currency inconvertibility and transfer restrictions, war and civil disturbance, or breach of contract. MIGA refers to itself as "an umbrella of deterrence" against government actions that could disrupt foreign investments. The World Bank explains, "MIGA's capacity to serve as an objective intermediary enhances investor confidence that an investment in an emerging economy will be protected against noncommercial risks."[6] Though Rostow says little about the importance of politically insuring foreign investments in developing economies, the assumption at the World Bank is that uncertainties about the stability of political environments make foreign investors skittish. MIGA attempts to address these uncertainties perceived by foreign investors through underwriting, technical assistance, and legal services.

Together the aim of the World Bank Group is to provide funds to governments and private investors for infrastructural and institutional development in developing countries, to provide support for foreign direct investment that might otherwise seem too risky to investors, and to resolve foreign investment disputes. However middle- and high-income countries dominate the

voting structures of the IBRD, IDA, IFC, and MIGA, and if the organizations are not funneling donor money, they are handling the concerns of foreign investors. Though these artifacts of the World Bank Group's structure may have helped the Bank achieve its goals, over the past 25 years, they have come to be seen by World Bank critics as liabilities.[17]

2.2 Early History, 1945 - 1950s: Reconstruction and the Beginning of the Cold War

The IBRD was formally recognized as an independent specialized agency of the UN in 1947.[18] Though the express purpose of the IBRD was to rebuild Europe, the fact that it was a lending institution actually hampered the pace of reconstruction. The booming US economy would only be kept alive if it soon found viable markets outside its borders, so the Marshall Plan of 1947 - primarily a package of grants as opposed to IBRD loans - was implemented to speed reconstruction.[19]

By the 1950s, the European economies were recovering, and the joint operation of the IBRD and the US Marshall Plan was seen as a success. As a result of this success, and perhaps as a result of continuously growing Western economies needing additional "viable markets," American concepts of "development" broadened beyond war-torn Europe. In his 1949 inaugural address, President Harry S. Truman laid out the groundwork for his Point Four doctrine extolling the benefits of scientific and industrial progress. He declared that these

benefits should be made available to "underdeveloped" areas both to alleviate human suffering and to battle Communism.[20]

The influence the Cold War had on the tone of international efforts during this time cannot be overemphasized. Though the USSR was an Allied force, former British Prime Minister Winston Churchill was leery of it and delivered a 1946 speech in which he referred to the USSR as an "iron curtain" that had "descended across the [European] continent."[21] Though the Soviet Union participated in the Bretton Woods conference, it did not ratify the Articles of the Bank or of the IMF. During a 1947 meeting of the UN General Assembly, the USSR actually referred to these organizations as "branches of Wall Street" and argued that the Bank was "subordinated to political purposes which make it one instrument of one great owner [the United States]."[22] With relations between the West (the US and Great Britain) and the USSR - all members of the United Nations Security Council - rapidly deteriorating, the newly formed UN could no longer exist as a body solely for international security. Countries worldwide began allying themselves with one of the superpowers - either the US or the USSR. The North Atlantic Treaty Organization (NATO), a security alliance of Western European and North American countries was established in 1949,[23] while the Warsaw Treaty, a security alliance of European Eastern bloc countries and the USSR, was signed in 1955.[24] With much of its membership divided along ideological lines by the 1950s, the UN decided to ground its work in combating poverty to prevent international turmoil, and the IBRD followed suit.[25] The

IBRD established its first sister organization, the IFC, in 1956 to promote economic development through private enterprises in developing countries.

Aside from the Cold War, another geopolitical development that foreshadowed complexities to come was the Bandung Conference of 1955. The United Kingdom was severely weakened during World War II, and following this war, the age of colonialism was coming to an end. As colonies transitioned to statehood, some Asian and African leaders believed it would be best to resist alignment with either NATO or Communist countries. These leaders organized the Bandung conference to build solidarity and establish an alternative alliance for social, political, and economic security among young countries.[26] In the words of Maggie Black, writer and journalist on development issues,

> This [conference] was the genesis of the 'Third World': an attempt to assert a group identity separate from both the capitalist West – the 'First World' and the Communist Eastern bloc – the 'Second'. As a geopolitical entity, the Third World never stood a chance. But that was not obvious at the time.[27]

2.3 Middle History, 1960s – 1980s: The Rise and Fall of the Developing World

The concept of a "developing world" gained steam by 1960, as 17 African colonies declared independence[28] and, in 1958, the Organization of the Petroleum Exporting Countries (OPEC) was formed.[29] Soon after, in 1961, the first official summit of the Non-Aligned Movement (NAM), inspired by the Bandung Conference, was held.[30]

For developing nations, the 1960s was a decade of promise – in more than one sense of the word. W.W. Rostow's *The Stages of Economic Growth* was published at the start of the decade,[31] and economists were optimistic that with enough monetary aid, new countries could easily be brought up to speed and integrated in the world economy much the way war-torn Europe had been. In 1960, richer nations also made promises of assistance: The UN kicked off its Decade of Development,[32] and the IBRD established the IDA – its new lending arm specifically for the poorest countries.[33] A year later, the US instituted its own humanitarian programs: the Peace Corps, the Alliance for Progress, and Food for Peace.[34]

The political view from the perspective of the Third World also likely appeared promising, since NAM membership more than doubled from 1961 – 1970. By the time of its third summit in 1970, the NAM comprised 54 nations,[35] and during each summit since 1961, members continued to affirm the principles of peaceful coexistence, support for movements of national independence, and resistance to Cold War military alliances.[36]

Even within the UN, developing nations were making statements of solidarity. The Joint Declaration of the Seventy-Seven Countries, signed in 1964, was an agreement among member countries to promote collective economic interests and create joint negotiating capacity in the UN, and the Charter of Algiers, the Group of 77 Countries' (G-77's) first set of economic and development demands, was signed in 1967.

At this time, the Third World very well could have been seen as a force with which to be reckoned. It was home to nearly 75% of humanity by 1970,[37] replete with natural resources, and establishing its political clout.[38] Developing countries were certainly seen by the US and USSR as ripe opportunities for alliances or extensions of their respective "spheres of influence." With the Cold War functioning as the geopolitical backdrop, one hardly wonders why the superpowers (the US and the USSR) became particularly interested in establishing friendly (or intimidating) terms with new states.[39]

This reality would cause trouble for international development efforts. Though professionals in the development industry initially believed that newly independent nations could become significant players in the global economy by the end of the 1960s,[40] their commitment to "neutrality" in the face of both state-to-state dealings and domestic strife (often condoned and/or financed by one of the superpowers) may have been what palled development efforts.

Within a number of developing countries, a combination of civil unrest, difficulty in balance of payments, and corruption made donor countries skeptical that their development monies were truly part of a worthy cause. Without a doubt, these problems occurred in some developing states because of their relationships with the US or USSR,[41] but neither the World Bank nor the UN wished to get involved in the dealings of sovereign nations. The World Bank Group did introduce ICSID to settle disputes between developing States and foreign investors in 1966, but this did not address the skittishness of donor

governments. As a result of the apparently exceedingly slow progress in international development, enthusiasm in donor countries for funding international aid dwindled toward the end of the 1960s. Aside from decreasing aid allocations, donors also began calling for policy reforms in the Decade of Development program. In response to these measures, in 1967 then World Bank President George Woods called for a "Grand Assize," or serious review, of how international development had been done.[42]

The Pearson Commission delivered what Woods called for in its 1969 report, *Partners in Development*. It reported that development results were mixed: International aid had been successful in growing Asian economies, but there was still much to be done for other geographic regions and the poorest sections of the world population.[43] Additionally Pearson concluded that successful development efforts went beyond economic growth and included social progress, redistribution of wealth, efficient administration, political stability, and democratic participation.[44] All the while, new World Bank President Robert McNamara brought the issue of poverty alleviation to the fore of the Bank's agenda.[45]

Unfortunately before much could be done on the recommendations of the Pearson Commission, changes in US monetary policy would turn the tide of international development. For the US, the combination of expensive military engagements abroad – both overt and covert – kept the military-industrial complex running at home. Meanwhile the increasing availability of inexpensive

goods from "Asian tiger" economies kept American dollars flowing through the global economy. Though this type of foreign and trade policy proved beneficial to the US during the late 1940s through the 1960s (as the international economic system was hungry for its anchor currency - US dollars), by the end of the Vietnam War, the Nixon administration became concerned about the US trade deficit, rampant government spending on both domestic social justice programs and military campaigns, and what appeared to be an international dollar glut. In 1971 the administration decided to end the fixed relationship between gold and the US dollar that had been in place since the creation of the IMF and IBRD at Bretton Woods.[46] It was this change in US monetary policy that would inadvertently spark both triumph and tragedy for the Third World.

Once the dollar no longer had its value fixed at $35 per ounce of gold, international financial markets promptly devalued it. As a result, all goods that had their value pegged to the dollar also dropped in price. One of those goods was oil. Oil-exporting countries felt the blow of the weakened dollar in their reduced purchasing power, and Middle-Eastern countries already upset over US support of Israel during the Yom Kippur War called for a temporary boycott of oil exports in 1973. The boycott was wildly successful: Oil prices quadrupled, and so-called "petrodollars" flooded the coffers of oil-producing nations.[47]

The developing world saw the oil shock as its cue to get highly industrialized nations to renegotiate international trade and financing on their terms. Through its weight of numbers, the G-77 called for a New International

Economic Order during two special sessions of the UN General Assembly in 1974 and 1975.[48] Success seemed within grasp. As Black notes,

> No less a figure than Henry Kissinger, then US Secretary of State, said that the industrialized world was ready to enter negotiations with the developing nations on a restructuring of global financing and trading institutions.[49]

This marked the high point of international relations as far as the developing world was concerned. As the decade wore on, however, no further action was taken, and the level of developing world unity inspired by the 1973 oil shock was never repeated.

Black explains this likely occurred for two major reasons. First, few resources compare to oil in terms of indispensability, so no other resource-based embargoes caught much attention. Consider that few alternatives exist for oil today - let alone during the 1970s. Second, during this time, the economic gulf between low-income and middle-income developing nations widened dramatically, and their interests naturally began to diverge. So much money was made by oil-exporting nations during the oil shock that revenue simply couldn't be spent faster than it was generated. Subsequently most of these petrodollars were deposited into banks, and this flood of new monies set the stage for dependency and crisis for low-income developing nations.[50] Once poorer developing nations assumed "debtor nation" status in the 1970s, this put nails in the coffin for the dream of a united and powerful Third World.

Economies rich with petrodollars didn't simply put them away in banks for a rainy day; they expected returns on their investments. This posed a challenge to banks, since bank profits are based on the difference between interest income generated through loans and interest payments made out to investors with accounts. Once petrodollars entered the international banking system, bankers were rushing to find lenders to make good on their advertised rates to investors (and to keep the banking system running). Stagflation put a crimp on demand for loans in industrialized nations, but willing borrowers existed in Latin America, Africa, and Asia. Not only were these non-oil-exporting economies "up-and-coming" and eager to improve their infrastructures, but also they were doubly hit by the oil shocks. They needed loans to cover the cost of expensive oil imports, and they were losing money on their non-oil exports. Just as industrialized countries didn't have much appetite for loans, demand for exports from the least developed countries (LDCs) was low as well.[51] Put succinctly, banks were awash with petrodollars, and loans to developing economies were a way to put them to work. Additionally international aid contributions were still low at this time, so loans made available by private banks seemed to make up for the difference.

Another oil shock occurred in 1979, and it was perceived by many in the industrialized world as another stunt by OPEC to maximize profits.[52] Though it was actually the result of instability in Iran, it acted as a catalyst for conservative rankling in the US and elsewhere - most notably Great Britain with the rise of Margaret Thatcher and her brand of economic conservatism. However it was

actually the conservative anti-inflation policies of the Reagan administration in the US that probably did more than anything to "light the fuse" of the debt crisis in the 1980s.[53] US unemployment rates were driven to their highest since the Great Depression - again decreasing demand for LDC exports. At the same time, the Federal Reserve increased interest rates to double digits.[54]

Petrodollar loans held by developing countries had variable interest rates, so the dramatic changes in US monetary policy doubled - even tripled - the debts of LDCs practically overnight.[55] By 1982, Mexico became the first LDC to publicly announce that it could no longer keep up with its interest payments. All other Latin American debtors (except Colombia) and many other foreign debtors soon followed.[56]

A new crisis was before international monetary experts: What would happen if the big loans to LDCs from big transnational banks turned out to be bad? Believing that the debt crisis threatened the entire international financial system, experts called upon the IMF to provide emergency loans so that debtors could continue making their interest payments. Though monetary and trade policy in the West played a significant role in the situation, the prevailing philosophy of the IMF was to treat debtors' balance of payments problems as debtors' problems solely.

This viewpoint can actually be traced back to the Bretton Woods conference. British economist John Maynard Keynes and US economist Harry Dexter White disagreed on the approach the IMF should take for addressing

balance of payments problems.[57] Keynes advocated that both creditor and debtor nations adjust their policies to fix trade imbalances, but White was more concerned about inflationary pressures. He believed that balance of payments deficits could be fixed within deficit countries through austere policy changes.

Consequently in the 1980s, the IMF viewed the economic problem of deficit nations as one of excessive demand in their respective domestic economies. The way the IMF prescribes to alleviate excessive demand is known as "structural adjustment": The troubled economy must cut back on imports and government spending, and it must increase exports. What this meant for many deficit nations was if they wanted to preserve their credit and obtain funds from the IMF to continue making their loan payments, they would have to make drastic cuts in government spending on public services such as healthcare and welfare. Government-owned industries were also sold off to the highest private bidders.[58] Resource extraction projects - which bode well for increasing exports but not for environmental health - would also have to quicken pace. Such conditions were specified by the loans offered by the IMF and termed "structural adjustment programs" (SAPs).

The IMF was well aware that SAPs would need time to help indebted countries out of the holes they were in, and the World Bank played a supporting role in offering economic advice and providing additional loans. The IMF's goal in approving structural adjustment loans was actually to bring deficit nations' debts to a "manageable" level - and not to save them from the predicament of

which they were victims. Sadly, many World Bank staff were aware that structural adjustment would bear a heavy human toll over the years to come, but their warnings fell upon deaf ears in the US Treasury and Reagan administration.[59] Primary concerns of structural adjustment architects were (1) that the international banking system should avoid collapse, (2) that indebted developing countries learn fiscal responsibility, and (3) that international banks not receive a "handout" from the IMF and World Bank for making speculative loans.[60] Though these points may seem reasonable enough, it remains questionable if the human suffering within indebted LDCs has been worth it.

From 1980 - 1989 the IMF and World Bank approved and/or managed structural adjustment loans and/or programs for at least 43 countries.[61] Over this period, the total external debt burden of all developing countries more than doubled from $660 billion to over $1.5 trillion.[62] Additionally for the first time, net financial transfers between rich and poor nations went into reverse; debt repayments from developing countries surpassed the inflow of aid, investment, and private lending from wealthy countries.[63]

The reasons for the drop off in aid contributions were likely twofold. First the debt crisis shook faith that aid would, in fact, benefit citizens that most needed it. Second the neoliberal philosophies of the Reagan and Thatcher administrations also set the tone for decreased aid from the West in general. As Black observed,

> [T]he use of public funds for investment in other countries' social and economic infrastructure was [seen as] way out of line. Under Prime Minister Margaret Thatcher, the UK aid budget was only given the kiss of life after it was pointed out that it was useful for strategic leverage with allies, and that much of it went to the British end of the development industry - UK companies, consultants and academic institutions.[64]

The 1980s became known as the "Lost Decade" of international development for both the huge financial outlays LDCs were required to make and the meager aid contributions of donor countries. As a result, the plight of the poorest populations in LDCs worsened, as fewer funds were available for government assistance, health care, education, and in some cases, even domestic food production.[65]

2.4 Late History, 1980s - Present: The World Bank Attempts to Reinvent Itself

By the end of the 1980s and the start of the 1990s, the World Bank - as a development institution - was viewed with a critical eye by many governmental and nongovernmental aid organizations including Oxfam, the UN Children's Fund (UNICEF), and the US Agency for International Development (USAID). The Bank's poor reputation among parties that should have been its allies in international development troubled many World Bank staff and Bank presidents Barber Conable (1986 - 1991) and James D. Wolfensohn (1995 - 2005).[66] The Bank already knew from previous scares in the 1960s and 1970s that a poor public image could seriously threaten the inflow of development donations from wealthier countries. Thus throughout the 1980s and 1990s, the Bank underwent dramatic bureaucratic transformations in an attempt to be more responsive to the

charges of its critics. It tried to both increase its transparency and exercise greater environmental conscientiousness in its development efforts.

First the Bank established a Small Grants program in 1983 to promote cooperation among nongovernmental organizations (NGOs) working in development, government, academia, and the media. A year later, The NGO Working Group was established to provide a forum for development issues and to build consensus among organizations regarding the efforts of the World Bank. Significant institutional changes came under the leadership of President Conable in 1987, when all staff members were reorganized from two previous camps - "Programs" and "Projects" - into combined Country Departments. Regional and Central Environment Departments were also created that year.[67] It was hoped that this change would shift the Bank's focus away from money moving and application processing and instead toward developing regional awareness for the strengths and weaknesses of the projects proposed for financing.

In 1988 MIGA was established to guarantee foreign investors against noncommercial losses. The need for this type of agency might have been particularly important during the 1980s, since it was over this time that the Bank and many of its funded projects were particularly unpopular. The bank's involvement in high profile, environmentally destructive projects, such as the Polonoroeste highway program in Brazil and the Narmada Valley Dam in India, won the disdain of environmental advocates.[68] Prior to the environmental awakening of the Western world in the late 1960s, environmentally destructive

infrastructural projects were considered a fact of life; toward the end of the 20th century, however, such projects came to be viewed as politically unacceptable.

The Polonoroeste project – also known within the Bank as the Northwest Integrated Development Program[69] – became a lightning rod issue in the 1980s due to the rapid deforestation of Brazilian rainforest and local conflicts that result. Indeed the popular interest of the West in the condition of South American rainforests eventually lead to a full-blown Congressional hearing in 1989 on the environmental impacts of World Bank projects.[70]

During the hearings it was found that though the Bank had adopted a policy mandating environmental impact assessments (EIAs) for its projects back in 1978, shortcomings to how assessments were conducted diminished their effectiveness. Rather than have independent contractors or the Bank do the assessment itself, the governments of site countries were to be responsible for the EIA.[71] Since many LDCs lacked both adequate funding and technology to do accurate assessments, EIAs were little more than a formality. As a result of these hearings, the US Congress decided to impose additional environmental conditions on money donated to the Bank.[72]

Critical internal reports also showed reformers how much needed to be done to make the Bank work even on its own terms – giving ammunition to more damning opposition embodied in the '50 Years is Enough' alliance calling for abolition of the Bretton Woods institutions altogether. Mass popular protests, particularly those against the Narmada Valley dam project in India, undermined

the Bank's position that it could be a responsible development player in the name of sustainable development. These pressures, fed into the Bank through its major shareholding governments (as was the case for the US Congressional hearings) forced further attempts at reform.

On the heels of the Congressional hearings, the Global Environmental Facility (GEF), a fund designed to support UN multilateral environmental conventions on biodiversity and climate change, was established in 1990. The mission of the GEF and the challenges it faces are discussed in more detail in *Chapter 6: A Critical Look at One of the World Bank's Reinventions: The Global Environment Facility.* The GEF is of particular interest because funding for any projects designed to mitigate environmental impacts on biodiversity from development sponsored by the World Bank come from this entity.

In 1992 the Bank's annual World Development Report focused on the environment.[73] This apparent greening of the Bank was likely inspired by the Rio Earth Summit of 1992.[74] This momentum for environmental conscientiousness probably also helped the Bank institute greater measures for accountability from 1992 - 1993. In 1992, the Bank agreed to conduct an independent investigation of its involvement in the highly controversial Sardar Sarovar project in India (and as a result, the World Bank withdrew its support of the aforementioned Narmada dam in 1995). In 1993, the World Bank established its own Inspection Panel to investigate external complaints from groups negatively impacted by Bank-funded projects. Additionally the IFC, the arm of the World Bank Group promoting

private enterprise in developing economies, began environmental training for financial intermediaries.[75]

Despite these efforts, the Bank remained unpopular due to its slower developments in transparency and continued support of the IMF's SAPs. 1994 marked the 50th anniversary of the World Bank, and the Bank was well aware of its tarnished public image. Hoping to enhance its reputation, the Bank opened its Public Information Center in Washington, DC during that year. In keeping with its public relations efforts, President Wolfensohn established additional landmark programs between 1996 and 2000.[76] In 1996 the Quality Assurance Group (QAG) and the Heavily Indebted Poor Countries (HIPC) initiative were launched, while in 1997 the Government Action Plan and adaptable lending were instituted.

Through the QAG, Bank accountability was brought to a new level through self-monitoring of advisory services and project supervision. Reports made on projects to the Board of Executive Directors acted both to inform member countries of project progress and to curb corruption and waste - issues that were never of great concern to the Bank during the Cold War.[77] Meanwhile the HIPC initiative aims to move the poorest, most indebted countries past endless debt restructuring toward lasting alleviation of debt. In 1999 part of the HIPC initiative granted approximately $34 billion in debt-service relief.[78]

As another departure from the Bank's previous laissez-faire stance on human rights violations and government corruption, the Governance Action Plan drives clean government initiatives in developing countries. From 1997 - 1999 over

600 initiatives were started in nearly 100 borrower countries. Meanwhile adaptable lending instruments gave client economies more say in how World Bank monies were to be used.[79]

In 1998 and 1999, the IFC revisited and strengthened its existing social and environmental policies, and the Bank announced its new mission: "Our dream is a world free of poverty." The Bank also dramatically changed its approach to poverty-reduction strategies at this time. With the adoption of the Comprehensive Development Framework, the World Bank and the IMF agreed to implement poverty-reduction strategies that were penned by client countries as opposed to those that were prescribed by Western experts.[80]

All of these changes, however, did little to improve the Bank's image. During the year 2000, its Annual Meeting in Washington, DC drew huge protests. Perhaps in response to this pressure, the Bank delivered $34 billion in debt-service relief to 22 countries. During this year it also launched the Global Development Gateway – a web portal where users could research and contribute information, resources, and development tools.[81]

2.5 Conclusion

It would appear that in the last decade, the Bank has made significant changes for the better. It adopted social and environmental policies for its projects, became more transparent and decentralized, and launched initiatives for

heavily indebted poor countries and new approaches to poverty reduction strategies.

The World Bank, however, remains a tool of the international monetary system and a proponent of world trade. These ends do not always mesh well with effective poverty reduction or environmental conservation. Fundamentally the World Bank was born to rebuild war-torn economies so that they could return as players to the global economic system. Once that was achieved, the Bank moved on to "underdeveloped" economies with the same goals in mind.

However underdeveloped economies were quite different from war-torn Europe, so the development strategies that worked in the past did not transfer directly. The massive waste of development project funds that characterized development efforts during the Cold War were completely unanticipated. Development experts failed to appreciate the lack of experience or knowledge former colonies had with Western economic theory and technology, and the profound influence of the Cold War was never fully recognized. Unlike Western Europe, developing countries had to forge their political identities and international relationships in Cold War environs: They could align themselves with the capitalist West (First World), the Communist Eastern Bloc (Second World), or join the NAM (Third World).

At the time, US foreign policy was oriented toward the "containment" of Communist ideology – typically overshadowing other development efforts. Thus to the US, even the rumblings of self-determination among Third World political

and intellectual leaders sounded suspiciously like alignment with the Communists. Thus during the Cold War, both the US and the USSR threw their support behind regimes each perceived as "friendly" to secure their respective spheres of influence - even if corruption and serious human rights violations were rampant. Both superpowers also funded military action against parties perceived as ideological threats. Multinational aid agencies such as the UN and the World Bank were aware that many developing countries were politically unstable, but they didn't intervene in any significant ways so as to appear neutral to the superpowers. As a result accountability for development projects was low and much international aid was lost to rogue governments.

The fallout from unilateral changes in US monetary policy in 1971 was also wholly unanticipated. When the US decided to devalue the dollar to bring its deficits into line, this decision acted as the domino that depressed oil prices on the world market, angered petroleum-exporting nations, sparked the oil embargo of 1973, and quadrupled the price of oil for the better part of the decade. Aside from making petroleum-exporting nations tremendously rich in a very short time, the international banking system was flooded with petrodollars that needed to be recycled as loans to someone, somewhere - and the recipients ended up being developing nations. Initially, ubiquitous, cheap loans seemed to be another funding option for cash-strapped, growing economies - particularly since donor countries were actually decreasing allocations for international aid. But once the interest rates on the large, variable-interest loans skyrocketed, international

monetary experts realized that they could have a debtors cartel on their hands threatening confidence in the entire global monetary system. To avoid collapse and keep business running smoothly, the IMF and World Bank were charged with providing emergency loans and SAPs for flagging debtor economies. Structural adjustment called for austere measures that cut government funding within debtor countries for social welfare programs – a move with humanitarian, demographic, and environmental implications as will be discussed in *Neo-Malthusian and Neo-Marxian Views on the Mechanisms of Environmental Destruction.* In keeping with the IMF prescription for "excessive demand" and Rostovian development theory, Bretton Woods also pushed for increased natural resource exports – another environmental pressure on top of the desperate humanitarian condition. Such macroeconomic adjustments were advocated so that indebted economies could find the money to continue making their interest payments. Over this time from 1980-1989, the total external debt burden of all developing countries more than doubled from $660 billion to over $1.5 trillion. Debt repayments from developing countries surpassed the inflow of aid, investment, and private lending from wealthy countries, and the 1980s became known as the "Lost Decade" of international development.

Though the Bank is well aware that the conditions of today's world economy are quite different from what existed immediately after World War II, only recently has it attempted to transform its approach to international development. These transformations appear to have been motivated by the Bank's

negative reputation among social and environmental professionals that it instead hoped would be international development allies. The Bank's negative reputation was due to its supporting role in the IMF's SAPs, which gave debtor economies strict guidelines for macroeconomic adjustments. In the Bank's most recent program designs, client countries are instead given more of a say in plans for macroeconomic restructuring and in the application of World Bank funds for projects. However the following questions remain: Though debtor countries are given more of a say in the fund disbursement process, does their participation matter during negotiations, or do rich donor countries continue to make the most substantive decisions? Do World Bank policies that aim to preserve accountability, environmental quality, and social welfare actually achieve these ends? Answers to these questions can be uncovered by looking more closely at World Bank programs and policies. A special World Bank program specifically designed to preserve biodiversity, the Global Environment Facility, will be considered in greater depth in *Chapter 6: A Critical Look at One of the World Bank's Reinventions: The Global Environment Facility.*

Before looking more closely at the connection between the World Bank's development practices and environmental destruction, however, it is important to understand the Bank's governing development philosophy. Whether or not one agrees with the global economic agenda of the World Bank, its actions do rest upon some economic theoretical assumptions. Those assumptions are discussed in the next chapter.

3 Chapter 3: Rostovian Development Theory

Humanitarians, development experts, and globalization advocates have at least one interest in common – the eradication of world poverty. Though their primary motivations for addressing poverty may be divergent, the benefits of poverty alleviation are broad. Over the last century, it is the advocates of globalization who have cornered the marketplace of ideas on how economic development ought to be practiced. Rostovian development theory – named after its architect, W.W. Rostow – has guided both the Bretton Woods Institutions and international aid agencies in their development efforts for decades.

Rostovian development theory[82] is rooted in neoclassical growth theory and is a formal representation of US economic development policy following World War II to the present. Generally speaking, the fundamental neoclassical model[83] assumes that for a given economy, production exhibits constant returns to scale. This means that as more workers are employed and factories are built, the economy grows, and a growing economy is what increases the wealth and well-being of the population.

This is not all, however, as economic efficiency is also important for increasing the rate growth. Efficiency, or output per worker, depends on the stock of the capital per worker – that is the amount and quality of capital (e.g. buildings, machinery, software) available to each worker to produce goods. Thus the primary question in neoclassical development theory is how to increase the stock of capital.

The amount of capital can be increased through additional expenditure on tools, machinery, and other labor saving devices; however, the quality of capital is dependent on technological innovation. As a result, neoclassicists focus their energies on ways to encourage capital accumulation, expenditure, and innovation. Neoclassical economics assumes that the amount of money an economy saves is a good approximation for the amount that is spent on capital, thus wealth creation and the establishment of social norms and institutions amenable to finance are important pieces of the neoclassical agenda. But neoclassical economics is silent on the details of exactly how institutions, organizations, government interventions, or other programs should be launched to ensure success.

To address these details, in his most notable, influential, and controversial work on international development economics, *The Stages of Economic Growth*, W.W. Rostow advances a five-part theory for development. Rostow spoke to both economic and non-economic indicators, and the chronological stages of his theory are (1) the traditional society, (2) the preconditions for take-off, (3) the take-off, (4) the drive to maturity, and (5) the age of high mass consumption. Based upon an historical economic analysis of different economies and when their Industrial Revolutions occurred, it is Rostow's prescription of these stages and their transitions that remain highly influential to the World Bank.[84] Each stage and its transitions are summarized below.

3.1 Stage 1: The Traditional Society

In the first stage, an assumption is made that technological application and advancement is *ad hoc* and hardly an economic priority to the society. It is actually the lack of widespread technology and technological advancement, as well as the prevalence of the agricultural sector, that characterizes Rostovian traditional societies. During the middle of the 20th century, many former colonies fit this description.

3.2 Stage 2: The Preconditions for Take-Off

In the second stage, Rostow noted that there are economic and non-economic changes that must occur. On the economic side, Rostow acknowledged the importance of increasing the rate of investment and of increasing per capita output; however, he did not agree that these increases alone lead to sustainable economic development. He added that a demand for greater technological investment must be established, and he argued that the drivers for technological demand are trade as well as the development of urban and suburban populations. In order to grow these new sectors of the economy, agricultural and extractive sectors (such as mining or logging) must rapidly expand to generate enough surplus for export as well as to feed burgeoning urban and suburban populations. This pressure to grow is thought to likewise incur pressure to innovate. Additionally the pressure to innovate creates a feedback loop between the natural resource and technological sectors. In order to increase agricultural yields, rates of

harvest, and rates of extraction, surplus income from natural resource sectors will necessarily be invested in technology that only the technological sector can provide. It is important to note that in the Rostovian description of this stage, natural resource sectors form the foundation for the developed economy - it is from a flourishing natural resource sector that technological sectors develop. What this means is that from a Rostovian point of view, subsistence activities in agricultural and extractive sectors by definition cannot be sufficient for an economy to industrialize. This explains why proponents of globalization - many of whom are quite active in the World Bank - and proponents of environmental sustainability through subsistence living fundamentally cannot see eye-to-eye.

On the non-economic side, the government has an important role to play in providing infrastructure and education. Rostow also made some statements about what he believed are necessary social preconditions for successful industrialization. He believed that the economy's leadership must value technology, and that the society as a whole must embrace change and specialized function. One of Rostow's most interesting beliefs about social preconditions is that nationalism may be another prerequisite. Rostow argued that healthy visions of national glory, as well as resentment of foreigners, could inspire local talent to pursue modernization. Additionally, nationalism could inspire political agendas for increased education, research, and technological design.

3.3 Stage 3: The Take-Off

The third stage, "the take-off" into sustained economic growth, is defined by three conditions: (1) a substantial rise in the rate of productive investment as a percentage of national income or net national product; (2) the development of at least one substantial manufacturing sector, where "manufacturing" includes the processing of agricultural or raw materials by modern methods (the assumption is that the said manufacturing sector's processes set in motion a chain of further modernization requirements that provide external economic effects industrial in nature); and (3) the existence or emergence of an institutional framework that exploits and sustains the economic take-off such as an efficient transport system. The take-off is uniquely characterized by the first two conditions, while the third condition also plays a fundamental role in the fourth development stage, "the drive to maturity."

Rostow admitted that the paths to take-off have differed historically across economies, but some general patterns could be described. The development of the first condition, a substantial rise in the rate of productive investment as a percentage of national income or net national product, is typically characterized by the rise of an investment class that does less hoarding and more productive investing. Additionally the extension of financial institutions and expansion of long-range financing often precede take-off periods. Of note, Rostow believed that increased demand for productive investment – that is investing in banking

companies - could be more decisive for industrial take-off than the supply of loanable funds.

Strategies for inspiring more productive investment have manifested in two major ways. One approach is land reform, where land ownership is transferred from the hands of "hoarding" landowners – those who keep their surplus resources to themselves – to the State. The State then redistributes land to working-class landowners – of which some later become entrepreneurial elites that drive economic take-off and later, sustained economic growth. This explains why the World Bank has supported the sale of lands that previously were tribal commons.[85] Yet another productive investment strategy is to increase effective demand for domestically manufactured consumer goods, providing incentives to business owners to increase production and innovate.

Generating sufficient demand to incentivize increased productive investment lies at the heart of Rostovian development theory, and Rostow believed that it would be very difficult to generate this demand without expanding export markets. He also argued that foreign capital could play an important supporting role, though he stated that a developing economy must be able to generate the capital initially required for economic take-off on its own for its transition to be successful. Thus Rostow envisioned foreign capital as most useful for large overhead projects such as necessary infrastructure. Indeed it is to infrastructure projects that most World Bank monies go.

Regarding the second condition for take-off, the development of at least one substantial manufacturing sector (where "manufacturing" includes the processing of agricultural or raw materials by modern methods), Rostow first elaborated on what he believed are the essential sources of local entrepreneurship during take-off. Social motivation and market reorganization in the agricultural sector are posited as necessary preconditions.

For social motivation, Rostow stated that the rise of an entrepreneurial class would occur not only once a rising entrepreneurial class valued technology, but also if the aforementioned class felt conventional routes to social success were limited and if the prevailing social structure was flexible (or weak) enough to allow material acquisition by commoners for upward mobility. Market reorganization in the agricultural sector could be a catalyst for the rise of such an entrepreneurial class, but the entrepreneurial class itself could also bring about market reorganization through nonviolent or violent demands on its government.

According to Rostow, once an entrepreneurial class was mobilized, growth sectors in the economy could be grouped into three categories: primary, supplementary, and derived. Primary growth sectors were most important during economic take-off and drove the economy's transition from traditional to industrialized. Both supplementary and primary growth sectors derived momentum from changes in the cost-supply environment and technology diffusion, while derived growth sectors were linked to changes in demand.

Primary growth sectors are defined as sectors that set in motion expansionary forces elsewhere in the economy due to their rapid growth. Historical examples include the cotton-textile industry in Britain; railroads in the United States, France, Germany, Canada, and Russia; timber in Sweden; meat and dairy in Denmark; and the silk industry in Japan. Thus when the World Bank considers whether or not to fund a project, it also attempts to judge the project's expansionary economic potential.

Supplementary growth sectors likewise advance, either as a requirement of, or in direct response to, primary growth sectors. An historical example is the development of coal, iron, and engineering industries to support the expansion, development, and maintenance of railroads.

Derived growth sectors advance in relation to the growth of total real income, population, industrial production, or some other modestly increasing parameter. Typical examples include food output in relation to population and housing in relation to family formation.

Since there is no formula for economic take-off (different types of industries have historically acted as the primary growth sector), Rostow identified four basic factors of successful economic transitions. First an enlarged effective demand for the primary growth sector's products must exist, yielding a foundation for rapid growth in output. Second new production functions (e.g. technology) as well as expansion of capacity must be introduced to the primary growth sector. Third the society must be capable of generating the initial capital required for

take-off independently, and there must be a high rate of plough-back by private or state entrepreneurs controlling modes of production, as opposed to hoarding. Fourth impressive growth alone will not characterize a sector as one that can kick-start economic take-off; the expansion and technical transformation of a primary growth sector must induce a chain of requirements for increased capacity in other sectors to which the society progressively responds.

Though Rostow believed the economic and social influence of economic take-off could be felt rather quickly, he acknowledged that this stage of economic development requires a massive set of preconditions that may take a very long time to materialize. Rostow's vision of the necessary preconditions for take-off are both entrenched and far-reaching, spanning across a society's economic organization, its politics, and its scale of values. Moreover Rostow believed that take-off bears two additional notable social effects: enlarged urban areas and political struggle between traditionalists and entrepreneurs. In Rostow's view, urbanization is necessary and beneficial because it enables both a large population of labor and an organized market structure that sustains industrialization. Likewise he believed that the triumph of modernists over traditionalists would bring sustained growth to the economy, as well as the everyday benefits of modern technology.

Many elements of Rostow's vision for this stage serve as additional points of contention for globalization and social justice proponents. Advocates of the Rostovian view see slums and riots as necessary stages on the path to

development, while social justice advocates see such conditions as unnecessary. Though Rostow might be correct that such conditions occurred in the past, social justice advocates argue that development in the 20th and 21st centuries could be achieved more humanely.

Additionally although Rostow's necessary economic conditions for sustained growth have informed most international development efforts since the 1960s, there are implicit assumptions that the World Bank and IMF have appeared to ignore (and unfortunately never fully acknowledge). Consider that the role of substantial government investment should be not only in infrastructure but also in public education, in which the Bretton Woods institutions do not invest. Additionally Rostow believed that technology transfer programs would have to be adequately funded and executed. Rostow finally became explicit about these points in the preface to the third edition of *The Stages of Economic Growth*[86].

3.4 Stage 4: The Drive to Maturity

Rostow defined this stage of economic maturity as that in which society applies the range of modern available technologies to the bulk of its resources. He also believed this stage would be characterized by significant differentiation across sectors.

Historical examples of societies stage four include the post-railway US, German, and French economies, with the rise of steel and differentiation that took place in engineering at the turn of the 20th century. Additional examples include

Sweden and Japan, both of which systematically applied technology to their natural resource bases. From 1890 – 1930, Sweden shifted from timber to wood pulp, planed board, and matches; developed its mining industry; and began producing goods domestically it formerly imported. From 1880 – 1940, Japanese agricultural output expanded, urbanization picked up pace, and land reform redistributed wealth so that developing modern and financial sectors could utilize it. Likewise new industries took hold such as railways, shipbuilding, cotton manufacture, silk cultivation and manufacture, coal and pig iron production, and arms production. Note that historically it has taken societies approximately 60 years to make the transition from take-off to maturity. Nevertheless the World Bank and its donor countries had been optimistic that such gains could be achieved in a fraction of the time with properly targeted interventions.

Though the aforementioned historical examples can give the reader some concept of what Rostow meant by "the drive to maturity," Rostow admitted that the definition of this stage of economic development is a bit hazy. He agreed that heterogeneity always exists in societies, so some regions will fully realize the benefits of modernization (typically large metropolitan centers) while others may remain technologically backward (such as rural areas or pockets of the populace that value cultural traditions over modernity). Rostow also noted that during this stage, income per capita – and typically consumption per capita – rises, but there is no fixed connection between technological maturity and either per capita real consumption or uniformity of per capita income. In other words, Rostow

understood that this stage of economic development would be likely to leave some people behind.

On this note, Rostow made some interesting observations. He conceded that the path to economic maturity bears "within it the seeds not of its undoing – for this analysis is neither Hegelian, nor Marxist – but the seeds of its own modification."[87] He noted that the makeup of the work force must change, and that under modern reorganizations, workers are likely to perceive the benefits of unionizing. He also stated that this economic stage lays the basis for political and social pressures that will lead to a long succession of humane economic modifications such as a minimum wage, paid vacation time, and other progressive reforms. He also argued that the mentality of successful political leadership must change from ambitious buccaneering to shrewd professional management of a bureaucratized and differentiated social system. Despite Rostow's observations on these points, critics of the World Bank and the IMF see Bretton Woods institutions as fixated on ambitious, economic buccaneering at any human cost.

Lastly Rostow referred to the rise of opponents to the human costs of industrialization such as the muckrakers, Continental social democrats, John Stuart Mill, and Marx, as a symptom of "the society... becom[ing] a little bored with the miracle of industrialization."[88] In keeping with the position of many of today's globalization advocates, it seems that Rostow's position on the question of whether or not any human costs of industrialization are worth it is that said costs are inevitable, and it is pointless to question them.

3.5 Stage 5: The Age of High Mass-Consumption

Once an economy became mature, Rostow believed that the society would have to make choices among three ends to which the mature economy could be put: (1) the national pursuit of power and influence with other territories; (2) the development of a welfare state to achieve human and social objectives that the free-market process did not; and (3) the expansion of consumption beyond basic food, shelter, and clothing. Historically, different societies have struck a balance between these three ends in different ways, but it is attention to these ends – rather than to problems of supply and demand or production – that characterize the final stage of economic stability.

3.6 Conclusion

Boiled down to their most essential distinguishing characteristics, Rostow's five stages of economic growth can be summarized as follows. The first stage, that of the traditional society, is heavily dependent on agriculture. Societies in the second stage, that of pre-condition for take-off, increase their technological investments and push to modernize usually beginning with their natural resource sectors. Societies in the third stage, that of take-off, develop at least one substantial manufacturing sector along with an infrastructural framework that hastens and sustains the take-off. A mobilized entrepreneurial class is also a necessity. Because there are many infrastructural and cultural requirements for successful take-off, this stage takes the longest to realize. Societies in the fourth

stage, the drive to maturity, apply modern technology to the bulk of their resources and differentiate across sectors. Looking at the history of industrial societies in the fourth stage, Rostow concluded that the transition from stage three to stage four is approximately 60 years. This stage is also characterized by unionization and the rise of economic management. Societies in the fifth stage, the age of high mass consumption, turn their attention away from problems of production and demand and toward choices among ends to which the mature economy could be put: the pursuit of power, the development of a welfare state, or the expansion of consumption beyond basic needs.

A number of things are notable about Rostovian development theory and how it has been put into practice by the Bretton Woods institutions. The first is that Bretton Woods followed Rostow's recipe for economic development only selectively – on some points, his observations were not heeded at all. In violation of Rostovian development theory, investment in local educational infrastructures (to grow local talent) has focused at the primary education level. Though it is important to increase literacy levels in developing societies, it is also important to provide knowledge opportunities for the best and brightest once primary education is completed.

Bretton Woods may also rely too much on foreign capital for detonating take-off. This observation is based upon the fact that, while the World Bank lacks special organizations for educational infrastructure, it has three for international investors.

Unlike Bretton Woods, Rostow was keenly aware of the need for governments to play an important role in the development process – namely for the purposes of infrastructural investment, education, and responsiveness to the populace during painful transition periods. Rostow believed that a system of governance resembling democracy would be important for successful economic development to occur – a condition that Bretton Woods turned a blind eye to during the Cold War. Rostow noted in the closing of his book,

> [S]ocieties must do more than have a creed. They must solve their problems.... If we and our children are to live in a setting where something like the democratic creed is the basis of organization for most societies... the problems of the transition from traditional to modern status in Asia, the Middle East, and Africa – the problems posed by the creation of the preconditions and the take-off – must be solved by means which leave open the possibility of such a humane, balanced evolution.[89]

It is precisely on this note where development efforts during the latter half of the 20th century went terribly wrong. During the Cold War, industrialized nations paid little attention to the governance structure of developing economies. Within the World Bank, concerns with "clean governance" developed only recently. Ignoring this component of successful take-off set development efforts back for a number of reasons: societies were not ripe for providing opportunities of upward mobility, and elites hoarded resources for themselves instead of investing in primary growth sectors.

Rostow could not have foreseen the many ways in which international economic development would be done wrong when he first published his theory in 1960. He was unabashedly optimistic about the efforts of industrialized

countries in international development despite the raging Cold War. He went so far to say, "The willingness of the governments of industrialized nations to contemplate enlarged soft loans and grants constitutes... a potential compensation for the diversionary and disruptive consequences of the Cold War."[90] Unfortunately the disruptive consequences of the Cold War were great and reverberate to this day. Additionally even the willingness of donor countries to contemplate aid has waxed and waned, and oftentimes their donations have been tied to their own interests. As will be seen in the Global Environment Facility case study, the tension between donor country and developing country interests continue.

What this all means for the World Bank is that during the Lost Decade of Development, its development practices went astray – much further away from a Rostovian development perspective. Institutionally it also resembles an entity that is built more for the protection of investors and donors than for the interests of developing economies. Yet even if the Bank did follow the Rostovian development framework more closely, Rostow clearly viewed the environment as a resource base and not as a precious resource in and of itself. With such a perspective, it is no mystery why rainforest would be cleared to make way for ranches or freeways.

Poor environmental management can bear serious consequences – particularly where biodiversity is concerned. Thankfully the World Bank instituted the Global Environment Facility in 1990 as a funding mechanism for

projects to guard against biodiversity loss in developing countries. Preservation of biodiversity and specific habitats upon which many unique life forms depend has become more widely recognized as important. The reasons why are discussed in the next chapter.

4 Chapter 4: Impacts and Mechanisms of Accelerated Biodiversity Loss

Environmental problems that are characterized by the irrevocable loss of genetic and biological diversity (e.g. species extinctions) are urgent to address for many reasons. First, there are existential losses that cannot be redeemed when species are extinguished. Second, knowledge of the natural world and our place in it is also compromised. Third, ecological services – such as climate modulation and water purification – risk destabilization with the loss of biodiversity. Fourth, potentially lucrative medicinal and agricultural goods could be lost as well.

Biodiversity is the variety of living things in the world, including the variety of ecosystems in which those things live.[91] The global pattern of the world's biodiversity is such that as one approaches the equator, the gradient of species diversity increases, and these geographic areas are comprised primarily of developing countries. As E.O. Wilson notes,

> So immense are the insect faunas alone in [tropical rainforests]... overwhelming even the opulence of the coral reefs, that on this basis alone it is reasonable to suppose that over half of all species are found there.[92]

Some areas not only hold great concentrations of endemic species – which means that these species can be found nowhere else on earth – but these areas are also under extreme threat of destruction. Such places are known as "hotspots" and were labeled as such by Norman Meyers in 1988.[93] Though collectively the hottest spots occupy only 2.3% of the planet's land surface, they alone are the exclusive home of over 50% of identified plant species and 42% of terrestrial vertebrates.[94] As will be shown in *Chapter 5: Links Between Biodiversity Hot Spots and*

International Development, the vast majority of these areas are located in the poorest economies.

Environmental scientists have tried to explain why habitat destruction by humans occurs. There are two main schools of thought on the issue: neo-Malthusianism, which is based upon the demographic viewpoints of Thomas Malthus, and neo-Marxianism, which is based upon the economic retort to Malthusianism penned by Prussian economist Karl Marx. In short, neo-Malthusians believe that environmental tragedies are the results of a natural process that must be managed, where human populations expand until they outstrip their resource base. Neo-Marxians, on the other hand, believe that both environmental destruction and overpopulation are symptomatic of political and/or structural injustices in society as opposed to being inherent impacts of human population growth. Both viewpoints, and the scientific ideas which underpin them, such as different population models, pronatalist and birth reduction pressures, and the IPAT identity, are explored in section 4.2, *Neo-Malthusian and Neo-Marxian Views on the Mechanisms of Environmental Destruction.* The research question of this thesis – whether institutional changes at the World Bank could slow or eventually stop destruction of biodiversity hotspots – is neo-Marxian in nature, since it assumes that the human factors behind development play a role just as important as, if not more important than, human fertility.

4.1 The Scale of the Problem of Biodiversity Loss

The two most significant drivers in modern extinctions are habitat destruction and the introduction of non-native or exotic species.[95] Yet another driver may soon be climate change.[96] In any case, both habitat destruction and the infiltration of exotic species can be tied directly to development efforts, since it is not uncommon for virgin land to be converted for infrastructure projects or agriculture (and with agriculture comes non-native, domesticated species ideal for export). Even if such projects are not the direct results of internationally sanctioned programs, they are the indirect results of global market forces.

Though it is difficult to know *exactly* how many species are lost (or are in danger of being lost), estimates from biologists, taxonomists, and ecologists place us on the verge of another wave of mass extinction. Mass extinctions have been documented five times through the geologic record – the last of which was the mass extinction that marked the end of the dinosaurs. Back then at the end of the Cretaceous Period, it was estimated that half of all species went extinct. What is so different about the current wave of extinction is that its strongest drivers are clearly related to the activities of one species – *homo sapiens*. If present trends of environmental mismanagement continue, it is estimated that one-third to two-thirds of all species will be extinct.[97]

It would seem that this revelation alone should be enough to sound a worldwide alarm. What complicates matters is that the importance of threatened and extinct species aren't realized until their populations are in dire straits or are

completely gone – if their importance is realized at all.[98] Only about 1.4 million species have been identified, but 10 to 100 million species are thought to exist.[99] Under these odds, it does not seem improbable that we lose many species before they are discovered.

Additionally though the loss of species is startlingly rapid, it also occurs imperceptibly. This paradox occurs because people are rarely cataloging, let alone monitoring, the ecological effects of land use decisions.[100] When people do notice changes in the distribution of species, it is because they are already gone. Wilson explains,

> Extinction is the most obscure and local of all biological processes. We don't see the last butterfly of its species snatched from the air by a bird or the last orchid of a certain kind killed by the collapse of its supporting tree.... We hear that a certain animal or plant is on the edge, perhaps already gone. We return to the last known locality to search, and when no individuals are encountered there year after year we pronounce the species extinct.... In order to know that a given species is truly extinct, you have to know it well.... You have to look long and hard without result. But we do not know the vast majority of species of organisms well; we have yet to anoint so many as 90% of them with scientific names.[101]

4.1.1 The Benefits at Stake

Though extinction is a natural process, as noted above, the rates at which species are currently disappearing have dramatically increased. The significance of biodiversity loss is also at times disputed, since the species that matter most to us – those that are farmed and/or used for landscaping – are in no danger of becoming extinct because of their proprietary value. How could the extinctions of wild, noncommercial species impact humanity if at all?

First it is important to understand the different types of biodiversity and how they are interdependent. There are three types of biodiversity: ecological, special, and genetic. Ecological diversity refers to the richness and complexity of a biological community, including the ability of that ecosystem to recycle materials within its system. Special diversity describes the number of different types of organisms within communities and ecosystems. Often the robustness of an ecosystem depends on its special diversity, so special diversity is important to maintain to keep ecological diversity optimal. Finally genetic diversity refers to the variety of different versions of the same genes within a species. Stable populations of species - those that are free from birth defects and are resistant to disease - depend on genetic diversity.[102]

Ecological and special diversity play significant roles in the sustenance and advancement of human society; however, these two types of diversity are dependent on genetic diversity. Thus entire populations of individual organisms must be protected to ensure adequate genetic diversity making for both healthy species and the preservation of ecological diversity.

4.1.1.1 Benefit 1: Ecological Services

Ecological biodiversity is what guarantees mundane, yet essential, services that we take for granted. Some examples of ecological services include provisions (breathable air, topsoil, pollination, seed dispersal, cycling of nutrients, and a habitable climate), detoxification (including decomposition of wastes and

purification of air and water), and protection (from harmful solar ultraviolet radiation, from erosion, and from the vast majority of disease-causing agents and potential agricultural pests).[103] In conservative estimates, attempts at accounting for the value of ecological services places their total value at $33 trillion *per year* (more than double total world gross national product, or GNP).[104]

The aforementioned dollar value of ecological services helps one see how expensive it would be to find technological substitutes for the services nature provides "free of charge" to the market system. This alone is sufficient reason to properly steward ecological diversity. Nevertheless it is also worth noting that relying on technology to bail humanity out of situations where one or several ecological services collapse is precarious; most cannot be replaced. A telling example comes from Biosphere 2, a $200 million project launched in 1991 that aimed to test whether or not an entirely man-made, closed system could sustain eight humans for two years. Eighteen months into the test, oxygen levels in the atmosphere dropped from 21% (normal levels) to 14% (oxygen levels below 14% could lead to death), while carbon and nitrous oxide levels skyrocketed. Pollinators also went extinct, which would have dramatically reduced agricultural capabilities over the long term. Geoffrey Heal noted,

> [I]n spite of great expense and the use of the most sophisticated technologies, the designers of Biosphere 2 were unable to... replicate some of the most basic and essential services that natural ecosystems provide...."[105]

It is for these reasons that ecological biodiversity must be preserved to keep ecological services properly functioning.

4.1.1.2 Benefit 2: Medicine and Other Health-Related Benefits

Species diversity is what gives us much of our medicine and provides other health-related benefits. Over 40% of pharmaceuticals are organism-derived rather than synthetic,[106] and the United Nations Development Programme estimates that pharmaceuticals derived from plants, microbes, and animals living in the global South are worth over $30 billion per year.[107] Some examples of organism-derived medicines include aspirin, numerous anticancer treatments, the antidepressant glaziovine, caffeine, codeine, the contraceptive diosgenin, ergonovine for migraines, menthol, morphine, the Parkinson's disease suppressant L-Dopa, and penicillin.[108] Such useful compounds are not simply found by chance; they are naturally engineered.[109] By learning about different species and observing what roles they play in nature, we can find ways to use their traits. The uses of leeches to control bleeding in surgery, and the isolation of chemical compounds from their saliva to treat hemorrhoids, rheumatism, thrombosis, and contusions serve as perfect examples.

Surprisingly, known medicines represent only a small fraction of what may be available. As an example, fewer than three percent of flowering plants in the world have been researched for medical application.[110] Though pharmaceutical companies are now making more concerted efforts to prospect tropical countries for useful chemical and genetic discoveries, this does not come without its own set of complications.[111] With estimates of extinction rates as high as 27 species lost *per day*,[112] even modern bio-prospecting becomes a race against time.

Aside from providing the aforementioned medicinal benefits, species diversity also protects us from up to 95% of potential pests and disease-carrying organisms.[113] Natural predators and species-to-species competition keep many disease-vector populations in check. A real-world example of how extinction can give rise to outbreaks occurred with Lyme disease. When passenger pigeons inhabited North America, they competed with mice and deer for acorns. Interspecies competition kept both the mouse population in check and the deer from frequenting the same food sources as the disease-carrying mice. Once the bird was gone, mouse populations exploded. Both mice and deer began frequenting the same areas for acorns, and disease transferred much more readily between mice and deer. As a result, Lyme disease could be more easily transferred to humans."[114]

In short, species diversity is important to preserve for two major health-related benefits. First, individual species may be medicinally valuable to humans, and second, species can play special roles in maintaining public health. Since each species is a component of a larger ecosystem, these points serve as additional reasons for preserving ecological biodiversity to benefit humanity.

4.1.1.3 Benefit 3: Food

As is the case with medicines, the gastronomic potential of biodiversity is woefully underutilized. Though it is obvious that all of our food comes from other organisms, less thought may be given to the fact that only 20 species provide 90%

of the world's food."[115] Estimates for edible plants range from 30,000 – 50,000 species, and only 7,000 are known to have been cultivated by someone, somewhere, at some point in time."[116] Nevertheless the curious dearth of variety in the global diet is due primarily to tradition and history. Consider amaranth, which is now making an entrance in the US market 500 years after its widespread use by the Aztecs. Had it not been banned by Spanish conquistadors for religious reasons during the 16th century,"[117] perhaps it would be as popular as corn. Wilson points out, "The old ways of using the land, chained to markets handed down by the traditions of conquistadors and the vagaries of foreign markets, extract only a small portion of the wealth while discarding the rest."[118] From this perspective, a multitude of species with no current commercial value could be quite valuable – we simply have not yet realized their potential.

4.1.1.4 Benefit 4: Cultural Value

Particular species may be valued for their symbolism (such the bald eagle in the US), their spiritual status (eagles among Native American tribes[119]), or even simply for their existence. Existence value refers to the satisfaction one gains from knowing that a particular species has not become extinct, even if one never sees the species in real life.

Often such charismatic species sit at the top of their respective food chains, so their protection requires the protection of their habitats. Natural ecosystems are also quite valuable in and of themselves, as the annual economic value of

outdoor activities and ecotourism demonstrates. The US Fish and Wildlife Service estimates that Americans spend $104 billion each year on wildlife recreation, which is more than the $81 billion estimated to be spent each year on new automobiles.[120] At the end of the 20th century, tourism became the second most important source of outside income for Costa Rica, ahead of bananas and catching up to coffee. Similarly, ecotourism was the third most important source of income for Rwanda – closing in on coffee and tea.[121] Wilson notes,

> More and more people from developed countries are willing to pay to experience, however briefly, the prehuman earth.... Rain forests used for the purpose have become many times more profitable per hectare than land cleared for pastures and fields.[122]

Wilson goes so far as to argue that humans subconsciously seek connections with the rest of nonhuman life.[123] He terms this phenomenon *biophilia* and cites the human propensity for natural phobias; our hard-wired responses to and cultural associations with snakes; our desire for beautiful landscaping; and the draw to zoos and aquariums (which in North America outpaces the draw to all professional athletic events combined), to vistas, and to beaches as evidence. Wilson concludes,

> Signals abound that the loss of life's diversity endangers not just the body but the spirit. If that much is true, the changes occurring now will visit harm on all generations to come.... We should judge every scrap of biodiversity as priceless while we learn to use it and come to understand what it means to humanity.... An enduring environmental ethic will aim to preserve not only the health and freedom of our species, but access to the world in which the human spirit was born.[124]

4.2 Neo-Malthusian and Neo-Marxian Views on the Mechanisms of Environmental Destruction

Whether or not Wilson is correct about biophilia, the most recent acceleration in biodiversity loss is certainly connected to human activities. What is it about the way that humans interact with their environments that leads to so much destruction? Is species loss inevitable for human survival? Foraging, agriculture, fishing, hunting, and energy use are inevitable activities that humans do for survival. Depending on the society, commerce would also be added to the aforementioned list. Why is it that some human societies have denuded their forests, polluted their water- and airways, and allowed their populations to suffer? In what ways do human factors – psychosocial, demographic, and sociopolitical – influence environmental destruction?

Though psychosocial factors such as personal and cultural values or religious beliefs play likely roles in how humans interact with their environments, these are not a central focus of this thesis. Instead more attention is paid to the dueling viewpoints of neo-Malthusianism and neo-Marxianism. These viewpoints are considered in detail for two reasons. First they offer explanatory models for the interactions between demographics, economics, and environmental impacts. Second, though Malthus and Marx coined their theories long ago, these perspectives influence both economic and environmental policy to this day – including decisions made by modern-day institutions like the World Bank.

4.2.1 Malthusian and Neo-Malthusian Views

Thomas Malthus published his paper, *Essay on the Principle of Population*, in 1798. In it he argued against a number of prevailing theories of the day regarding population.[125] He used a mathematical application regarding rapid, unchecked population growth compared to what could be expected for agricultural output. He showed that increases in agricultural yields would be arithmetic (linear) at best, while he expected population to increase geometrically (exponentially). His conclusion was that any institutional efforts to increase the population, improve wages, or offer welfare would have the unpalatable effect of giving rise to a population that could not be fed.[126]

Malthus did not stop there, though, as his essay leads to a generally negative view on the demographic fate of humanity. He also concluded that human populations have a natural tendency to outstrip food supply, giving rise to "misery," and even if a society tried to control its own population, the inevitable result would be "vice." Misery is described as war, famine, pestilence, or plague for the case of a population that gets out of control. Vice entails "lengthy postponement of marriage [that] would probably be associated with a rise in moral depravity and unnatural attachments" in the case of a population that attempts to control itself.[127]

No one maintains now that Malthus was wholly correct in his assessment. Aside from his many dubious assumptions regarding human nature,[128] there are other factors he simply could not foresee. Technology and trade have greatly

enhanced the capacity of nations to provide food for their citizens. Additionally demographic transitions and reliable contraception have stabilized populations in many areas of the world.[29]

Yet there is something familiar about Malthus' warnings regarding overpopulation. On a planet that holds over six billion humans (and counting) with shrinking doubling times, elements of his 18th century argument remain. In ecology, all ecosystems have a carrying capacity - the maximum number of individuals that can be supported by the ecosystem's resources – for each species living within.[30] Once a population shoots beyond its carrying capacity, diebacks are inevitable. Could Earth be approaching its carrying capacity for humans, and if so, are we bound for famine, pestilence, plague, and/or resource wars? Are human-induced mass extinctions just something that happens along the way?

People who believe that the answer to those questions, in some form, is yes are known as neo-Malthusians. At the heart of neo-Malthusianism is a belief that human overpopulation gives rise to overcrowding, sprawl, pollution, disease, resource depletion, starvation, poverty, crime, misery – even war.[31] In countries where the aforementioned problems are very much a reality, ballooning populations are considered an undeniable culprit. Thus neo-Malthusians believe that the most essential component of any strategy for global environmental stewardship must contain efforts to control human population and its rate of growth.

In societies with developing economies, most neo-Malthusians believe that aid should be provided to those living now, and for the future, developing countries should launch effective family planning programs. The World Bank has not yet dabbled in matters like family planning, but it does collect data on the literacy rates of girls and other information, which reflects an institutional interest in social factors linked to population trends. Nevertheless in the social justice and environmental quality debate, there are still neo-Malthusians that practically echo Malthus:

> Each rich nation amounts to a lifeboat full of comparatively rich people. The poor of the world are in other much more crowded lifeboats.... [T]he poor fall out of their lifeboats and swim for a while, hoping to be admitted to a rich lifeboat, or in some other way to benefit from the goodies on board.... We cannot risk the safety of all the passengers by helping others in need. What happens if you share space in a lifeboat? The boat is swamped and everyone drowns. Complete justice, complete catastrophe.[132]

4.2.2 Marxian and Neo-Marxian Views

In Volume One of *Das Kapital*, published in 1867, Marx took Malthus' arguments head on. He argued that Malthus was wrong on both fronts of his two-pronged population argument. He first disagreed that humans were subject to the same abstract population laws thought to exist for animals. He also believed that science and technology would soon be applied to agriculture, dramatically improving crop yields.[133]

On the point of population growth, Marx advanced, "[E]very special historic mode of production has its own special laws of population, historically valid within its limits alone."[134] He argued that in the crowded slums of 19th century

Europe, what was being observed was not human overpopulation in Malthusian, absolute terms. What was being observed was the creation of a surplus labor population that could not be absorbed into the labor market. Marx believed that the creation of this redundant, poor population was a necessary condition for, and an inevitable result of, the capitalist mode of production.[135] Thus Marx argued that the specter of a Malthusian population crash was both illusory and misguided.

Though Marx did not outline an alternative population model to Malthus' exponential model, an alternative population model does exist. Though Malthus' model of exponential growth intuitively makes sense, there is another ecological model that might better describe human population dynamics – the logistic model of population growth developed by mathematician Pierre François Verhulst in 1838.[136] Under the logistic model, populations approach carrying capacity but never reach it. As the population approaches carrying capacity, reproduction slows pace, and the population levels off. This type of population growth pattern is common for K-adapted species, which ecologists consider humans to be.[137]

Returning specifically to Marx's responses to Malthus, Marx had the foresight to predict the application of science and technology to agriculture to increase crop yields. Marx wrote,

> In the sphere of agriculture, modern industry... annihilates the peasant... and replaces him by the wage labourer. Thus the desire for social changes... [is] brought to the same level in the country as in the towns. The irrational, old fashioned methods of agriculture are replaced by scientific ones.[138]

In sum Marx believed that technological advances were bound to occur, raising agricultural output sufficiently to satisfy any demand by an expanding population.

Though Marx was right about the Green Revolution, his claims about the byproducts of capitalist modes of production continue to be controversial, and it is not the intent of this thesis to explore Marxian critiques of capitalism in detail. However opposite the Malthusian view, where the human drive to reproduce creates more people than resources – ultimately leading to poverty and other ills – Marx argues that social factors which *create poverty* give rise to overcrowding in slums, starvation, disease, misery, and violence.[139] This subtle distinction in the role of *poverty* as the driver for multiple humanitarian and environmental ills is not entirely lost on the World Bank, since the phrase, "a world free of poverty" has been part of its mission statement since 1998. What has been lost, however, is a genuine effort by Bretton Woods institutions to alleviate poor social conditions in developing countries while they undergo economic transitions. Under IMF structural adjustment, domestic government programs designed to soften the blows of economic transition were actually dismantled.

4.2.3 Neo-Malthusian and Neo-Marxian Views in Contrast

Neo-Marxian environmentalists have taken their cues from Marx's writings, though Marx, perhaps, would not agree with elements of the neo-Marxian agenda himself.[140] Nevertheless neo-Marxian environmentalists are quite unlike neo-Malthusians who believe that population control is paramount for

averting environmental collapse. Neo-Marxians instead call for technological development in poor nations and social justice to eradicate poverty believing that by addressing these injustices, Malthusian "misery" and its related environmental impacts can be forestalled.

Two process-flow diagrams, shown in Figure 4, contrast the neo-Malthusian and neo-Marxian views. While both viewpoints recognize the social and environmental pressure exerted by ballooning human populations, neo-

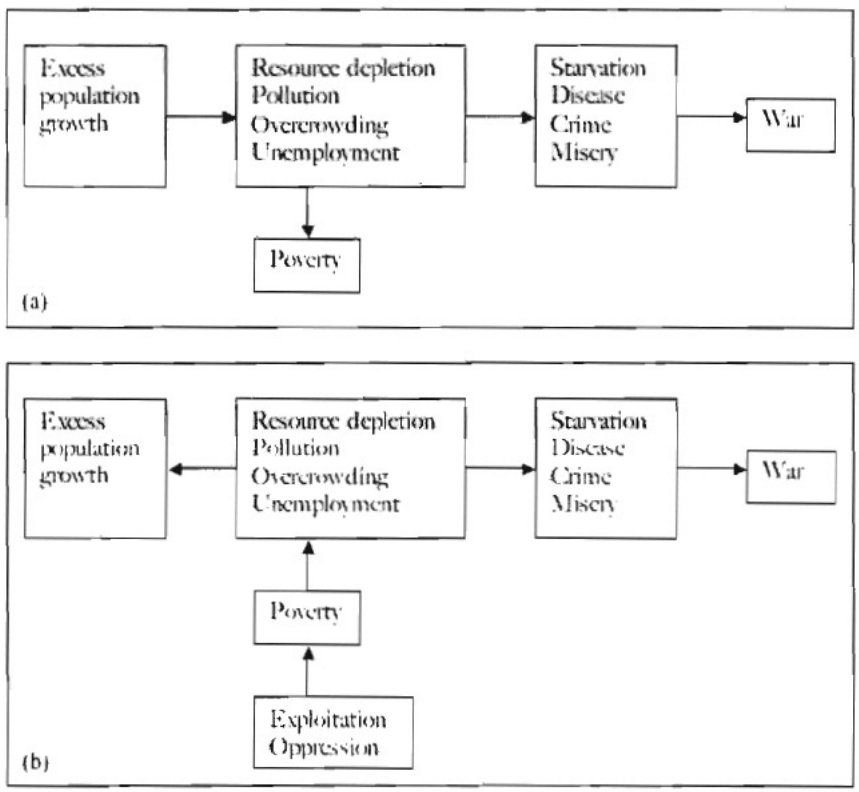

Figure 4. Malthusian and Marxian models for social and environmental problems. In (a) Malthus argued that excess population growth was the ultimate cause of many social and environmental problems. In (b) Marx argued that oppression and exploitation were the real causes of poverty, and it was poverty that gave rise to desperate material conditions (including environmental degradation) which act as pronatalist pressures and the seeds of other social problems. In Marx's view, population growth is a symptom or result of other problems, not the source. Reproduced from Cunningham & Cunningham, 79.

Malthusians see overpopulation as the result of an unchecked natural process (box (a)). Neo-Marxians instead argue that under unjust, dire social conditions (box (b)), people are pushed into a desperate mindset to obtain resources by any means and hence bear more children – since more children often means more on-hand, free labor; another potential breadwinner; and/or increased insurance for care during old age.

Two models lend support to the neo-Marxian view over the neo-Malthusian. First demographers have noted that pronatalist and birth reduction pressures do exist, as shown in Table 1.[141] Note that these pressures are closely linked to social justice issues such as distribution of wealth and reproductive rights. Societies characterized by poverty and a lack of reproductive rights have strong pronatalist pressures, while societies characterized by greater wealth and reproductive rights have lower birth rates.

Though the World Bank does not design or support social programs, its agnostic position on pronatalist social conditions may not help developing economies escape the demographic trap. For example, funding infrastructural projects and mining companies in a country where female literacy remains low may put the cart before the horse, since social conditions encouraging large families remain. Under such a situation, per capita gains in wealth that might be due to the World Bank's investment remain modest, since the country's population continues to grow.

Pronatalist pressures	Birth reduction pressures
• No/weak social security system • High infant mortality rate • Little opportunity for upward mobility (children are source of status, sense of purpose) • Additional source of income • Additional source of labor (agrarian communities) • High death rate • Cultural/religious values that encourage childbearing • Cultural values that hold children of one gender in higher esteem (parents may have more children than they desire to produce a child of the "right" gender) • Lack of reproductive rights (women are unable to decide how many children they would like to have)	• Social security system • Low infant mortality rate • Opportunities for upward mobility – especially for women • Women have access to alternatives to childrearing (education, professional opportunities, etc.) • Women are able to make substantial contributions to household income • Low death rate • Women have the option to limit childbearing

Table 1. Pronatalist and birth reduction pressures. Pronatalist pressures increase people's desires to have children, while birth reduction pressures discourage them. As economies improve, birth reduction pressures gradually give rise to demographic transition.

Second, from the perspective of environmental impact, the IPAT identity, a succinct model developed by researchers who also conducted *The Limits to Growth* study at MIT, shows that population growth alone cannot be considered the most significant driver of environmental degradation. The identity is given by

$$I = P \times A \times T,$$

where I is environmental impact, P is population size, A is a measure of affluence (typically material throughput or capital stock per capita), and T represents the environmental impact of technology (typically measured as the environmental

impact per unit energy used to produce the material throughput).[142] John Bellamy Foster notes,

> The equation shows that environmental degradation is not the result of increased population, or increased accumulation, or the introduction of less environmentally benign technology. It is a product of all three.... In contemporary discourse, environmental problems are most often blamed on Population growth (P), even though levels of Affluence (A) and Technology (T) almost always play a role. Affluence * Technology (AT) is shorthand for the socioeconomic (as opposed to the demographic) causes of environmental degradation, and together they far outweigh the impact of P alone.[143]

The IPAT identity remains controversial because it insinuates that rich, technologically advanced societies with relatively small populations (such as the United States) can do just as much environmental damage as poor, technologically backward economies with many people. It also suggests that significantly increasing the wealth and technology use of developing, populous nations could spell environmental disaster - particularly if demographic transition is a long way off or never occurs.[144]

For the context of this thesis, the important thing to understand about the IPAT identity is that the habitat destruction and its related impacts on biodiversity discussed in *Chapter 5: Links Between Biodiversity Hot Spots and International Development* are not due to population dynamics alone. An environmental impact such as biodiversity loss, especially in developing nations, is due to the confluence of continuing disparities in income, high rates of population growth, and the application of more sophisticated technology to hitherto undeveloped regions.

Though the neo-Marxian view is more nuanced than the Malthusian, and though the science behind it is compelling, solving the poverty-population problem to better preserve biodiversity is not easy. Indeed decades of effort and billions of dollars to developing countries from international development agencies and rich governments alike has not completely solved the poverty-population issue, and in some cases, Bretton Woods' development practices have been seen as the enemy of the very people and places that it aims to improve. This was particularly case for countries where structural adjustment programs - which rolled back governmental programs of all types from social security to health care - were mandated by the IMF and endorsed by the World Bank.

4.3 Conclusion

At the start of the 21st century, we are observing rates of extinction so rapid that ecologists believe we are in the midst of a human-induced mass extinction. The two most significant drivers of species loss are habitat destruction and the introduction of exotic species – two drivers that can easily be linked to human activities of land conversion. Paradoxically species loss has been both quick and imperceptible. This makes responding to the problem in an effective manner challenging.

Some people believe that preserving space for endangered species should be enough; however, to maintain healthy communities of a species, entire habitats must also be maintained. In biodiversity hotspots, multiple species are in danger,

which makes preservation of entire ecosystems all the more important. Additionally preserving ecosystems is important for the stabilization of ecological services and medicinal resources necessary for human survival. Other benefits of biodiversity include nutritional and cultural resources.

It is often assumed that population pressures alone are what lead to habitat destruction and the introduction of exotic species as human populations move into virgin territory. This is a neo-Malthusian view of the problem. But this view is incomplete, as human population growth responds to other social constraints such as the presence of a social welfare system, mortality rates, and opportunities for upward mobility. Because the absence of these stabilizing, social factors act as pronatalist pressures, a discussion of environmental protection cannot be had without a discussion of social justice and culture, and such a discussion will not occur outside of a neo-Marxian perspective.

As has been documented over the previous chapters, within the World Bank, concern for the environment has developed only recently. Though the Bank appears to be agnostic over the neo-Malthusian and neo-Marxian perspectives on environmental impacts, approaching economic development as if it exists independent of demography and the environment is wrongheaded. Unfortunately this is exactly what Rostovian development theory does, and it is Rostovian theory that guides the Bank. To further investigate why the neo-Marxian perspective offers an appropriate frame for the problem of biodiversity loss, the links between loss of biodiversity and economic poverty are explored in the next chapter.

5 Chapter 5: Links Between Biodiversity Hot Spots and International Development

As was mentioned in *Chapter 4: Impacts and Mechanisms of Accelerated Biodiversity Loss*, areas that both hold great concentrations of endemic species - which means that these species can be found nowhere else on earth - and are under extreme threat of destruction are known as biodiversity "hotspots." Though collectively the hottest spots occupy only 2.3% of the planet's land surface, they alone are the exclusive home of over 50% of identified plant species and 42% of terrestrial vertebrates.'[145]

The two most significant drivers in modern extinctions are habitat destruction and the introduction of exotic species.'[146] Yet another driver may soon be climate change.'[147] In any case, habitat destruction and the infiltration of exotic species can be tied directly to development efforts, since it is not uncommon for virgin land to be converted for infrastructure projects or agriculture (and with agriculture comes non-native, domesticated species ideal for export). Even if such projects are not the direct results of internationally sanctioned programs, they are the indirect results of global market forces. As will be shown, there is a statistically significant relationship between whether a territory houses at least one biodiversity hotspot and economic poverty.

5.1 Biodiveristy Hot Spots: What and Where Are They?[148]

A seminal paper published in 1988 by biologist Norman Myers first identified ten tropical forest "hotspots" characterized both by exceptionally high levels of plant endemism and by serious levels of habitat loss. In 1990 Myers added eight more hotspots, including four Mediterranean-type ecosystems. Conservation International, a non-profit non-governmental organization (NGO), adopted Myers' hotspots as its institutional blueprint in 1989, and in 1996, the organization reassessed the hotspots concept including an examination of whether or not key areas had been overlooked. An extensive global review was undertaken in 1999, which introduced quantitative thresholds for the designation of biodiversity hotspots. To qualify as a hotspot, a region must meet two strict criteria: It must contain at least 1,500 species of vascular plants (plants with true leaves, stems, and roots) as endemics (1,500 species is greater than 0.5% of the world's total), and it has to have lost at least 70% of its original habitat.

From the 1999 analysis, 25 biodiversity hotspots were identified. Collectively these areas held, as endemics, no less than 44% of the world's plants and 35% of terrestrial vertebrates in an area that once covered only 11.8% of the planet's land surface. The habitat of this land area had been reduced by 87.8% of its original size - decreasing the wealth of this biodiversity to only 1.4% of Earth's land surface.

The latest reanalysis of biodiversity hotspots was completed in early 2005. Over the past six years, the number of biodiversity hotspots has grown to 34.

Overall, the 34 hotspots once covered 15.7% of the Earth's land surface. Now 86% of the hotspots' habitats have already been destroyed. Thus, intact remnants now cover only 2.3% of the planet's land surface. Over 50% of identified plant species and 42% of identified terrestrial vertebrates reside in these hotspots.

Despite the nominal land area of hotspots, as can be seen in Figure 5,[149] they cover a much larger area geo-politically. No fewer than 129 nations and territories house hotspots, and hotspots can be found across the globe within diverse countries and economies. Nevertheless the vast majority of hotspots are found within lower-income, indebted states. This will be shown by cataloging the territories in which hotspots are housed and comparing the catalog to the World Bank's official income and debt classifications for world economies.

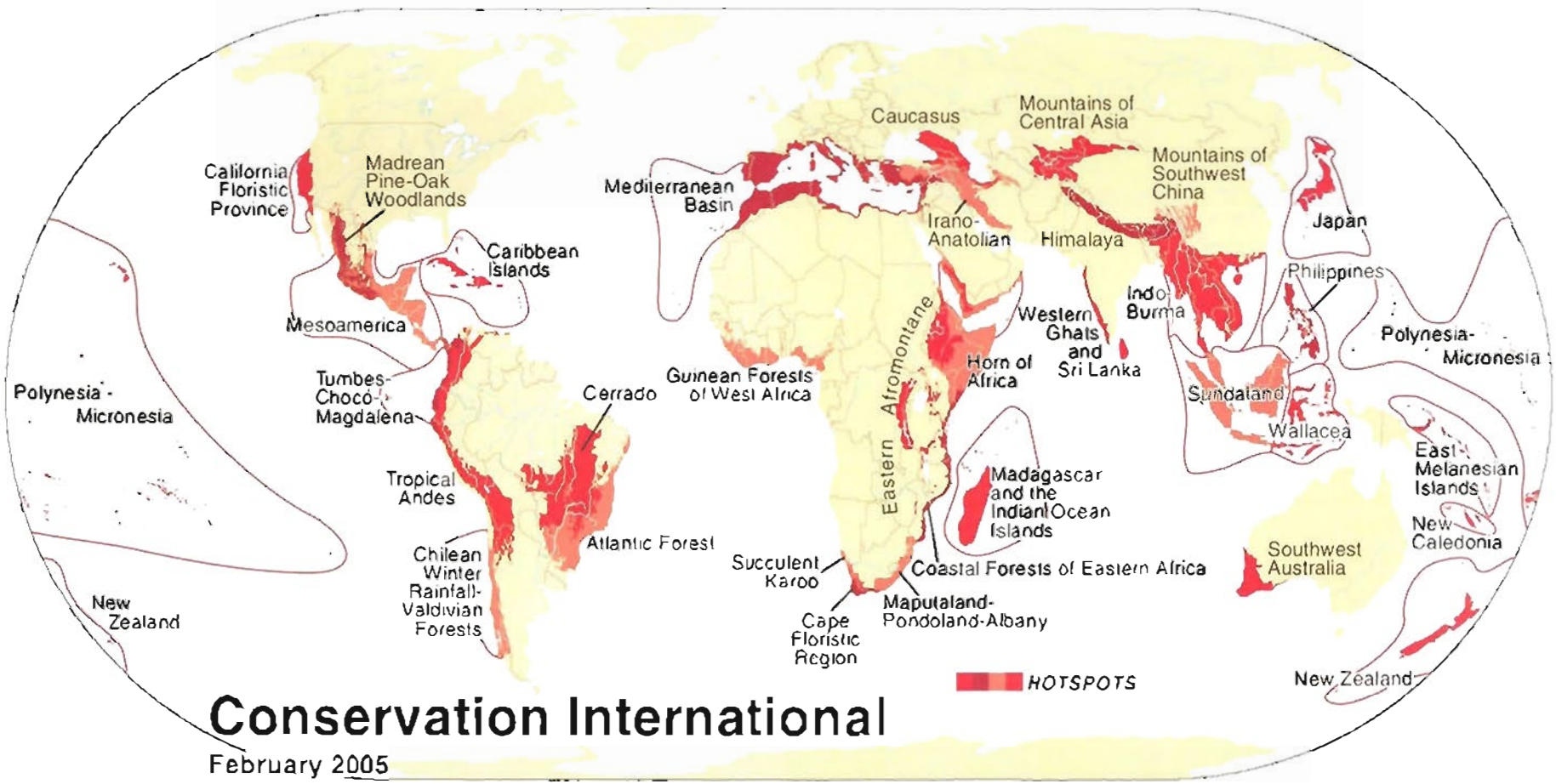

Figure 5. Map of biodiversity hotspots, 2005. Courtesy Conservation International. Red areas denote biodiversity hotspots. Differences in coloring correspond to different ecosystems.

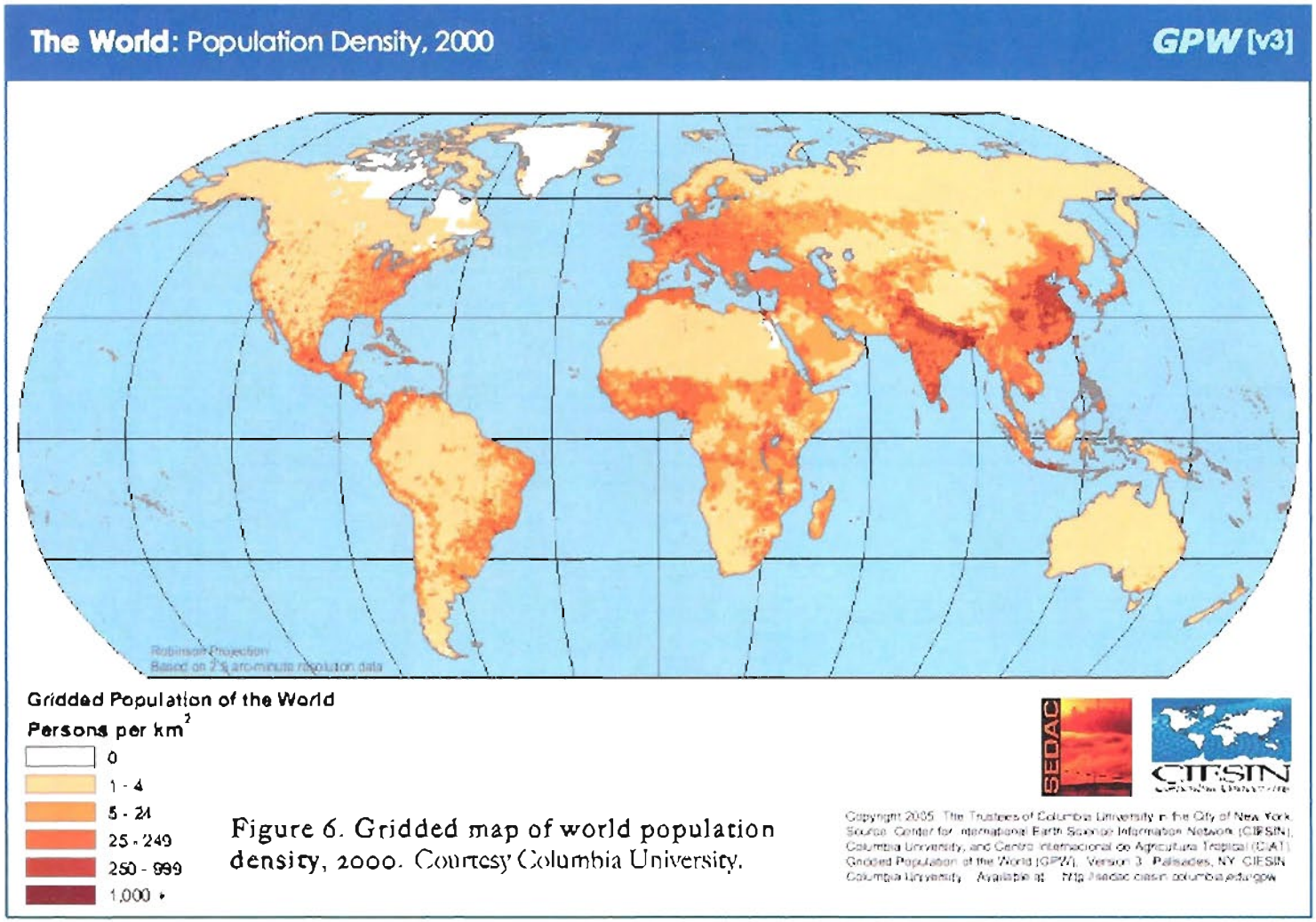

Figure 6. Gridded map of world population density, 2000. Courtesy Columbia University.

5.2 Distribution of Biodiversity Hotspots by World Bank Income and Indebtedness Classifications

As the world's foremost multilateral development agency, the World Bank defines both the income and debt classifications of world economies. Thus, World Bank income and debt classifications[150] were consulted to identify which countries are "poorest," both in terms of gross national income (GNI) and debt burden. These income and debt classifications were then compared to a catalog of Conservation International's mapping of biodiversity hotspots to ascertain the validity of the second argument of the research hypothesis: that biodiversity losses are pronounced in least developed economies, so much so that there is a likely link between these losses and the business of how international development has been practiced.

5.2.1 Distribution of Hotspots by Per Capita Annual Income

According to the World Bank's April 2005 classifications, income delineations are as shown in Table 2. The Bank's analytical income classifications

Income Classification	Per Capita Annual Income
Low	$\leq$ US$765
Lower-Middle	US$766 $\leq x \leq$ US$3035
Upper-Middle	US$3036 $\leq x \leq$ US$9385
High	$\geq$ US$9386

Table 2. World Bank income classifications for world economies, April 2005. Income classifications are based on annual per capita income in US dollars.

(low, middle, high) are based on the Bank's operational lending categories (civil works preferences, types of loan eligibility, etc.). GNI, a broad measure of gross domestic product (GDP) plus the net flows of factor income (such as rents, profits, and labor income) from abroad, was considered the best single indicator of economic capacity and progress; therefore, GNI per capita is the Bank's main criterion for classifying countries.

The term "developing economies" is often used in general discussions in Bank reports. It denotes the set of both low- and middle-income economies. Bank publications with notes on the classification of economies state that the term "developing economies... does not imply either that all the economies belonging to the group are actually in the process of developing, nor that those not in the group have necessarily reached some preferred or final stage of development."[9] Thus any economy that cannot be classified as high income is considered "developing." This is why in the "Cumulative Percentage of Hotspot Economies" column of Table 3, low-, lower-middle-, and upper-middle-income economies can together be referred to as "developing" economies.

When a catalog of the territories containing biodiversity hotspots is compared to the economies' income classifications, the hypothesis that biodiversity losses are significantly pronounced in least developed economies is supported (Pearson chi-square, df = 3, α for test < 0.005). Though only 38% (still the largest segment) of all economies housing hotspots fit the Bank's classifications for poorest economies, relatively poor economies (low-income and

lower-middle-income combined) make up 71%. When the Bank's definition of developing economies is also considered, a whopping 84% of hotspot economies are accounted.[152] Clearly an undeniable, statistically significant relationship exists between lack of prosperity and habitat destruction. These facts lend support to a neo-Marxian view of the biodiversity loss problem.

Income Classification	Percentage of Hotspot Economies	Cumulative Percentage of Hotspot Economies
Low	38%	Poorest : 38%
Lower-Middle	33%	Relatively Poor: 71%
Upper-Middle	13%	"Developing" : 84%
High	14%	
Not Applicable	2%	

Table 3. World Bank income classifications and hotspots status. The middle column shows the share of hotspot economies that fall in each income category. The column at right shows the cumulative percentage of hotspot economies included with each income classification. Low-income economies are the poorest, while relatively poor economies include low and lower-middle income economies. "Developing" economies include all economies that do not have a "High" income classification.

5.2.2 Distribution of Hotspots by Indebtedness

The World Bank determines debt classifications for many of its member countries, but a fair share are not classified. High-income economies do not have debt classifications, nor do countries for which indebtedness data is unavailable. For economies that are classified, the Bank primarily groups them according to one of two key ratios – either the ratio of present value of debt service to GNI or

the ratio of present value of debt service (PVDS) to exports. These ratios are determined through data reported directly to the Bank via the Debtor Reporting System (DRS). The Bank's 2005 indebtedness classifications for DRS economies are shown below in Table 4.

Indebtedness Classification	DRS Key Ratio 1	DRS Key Ratio 2
Severe	PVDS/GNI > 80%	PVDS/exports > 220%
Moderate	48% < PVDS/GNI ≤ 80%	132% < PVDS/exports ≤ 220%
Less Indebted	PVDS/GNI ≤ 48%	PVDS/exports ≤ 132%

Table 4. World Bank Indebtedness Classifications for DRS Economies, April 2005. These two key ratios are used to determine indebtedness classifications for economies that participate in the Debtor Reporting System (DRS). PVDS is the present value of debt service, while GNI is gross national income. GNI is the gross domestic product (GDP) plus the net flows of factor income (such as rents, profits, and labor income) from abroad.

Some economies, however, do not report detailed debt statistics to the DRS; thus present-value calculation is not possible. Instead four key ratios are calculated, each of them averaged over the past three years (in this case averages over 2001-2003): debt to GNI; debt to exports; debt service (DS) to exports; and interest to exports. If any three of four key ratios match the benchmarks listed below, economies are classified according to Table 5.

Indebtedness Classification	Non-DRS Key Ratio 1	Non-DRS Key Ratio 2	Non-DRS Key Ratio 3	Non-DRS Key Ratio 4
Severe	$\frac{\text{Debt}}{\text{GNI}} > 50\%$	$\frac{\text{Debt}}{\text{Exports}} > 275\%$	$\frac{\text{DS}}{\text{Exports}} > 30\%$	$\frac{\text{Interest}}{\text{Exports}} > 20\%$
Moderate	$\frac{\text{Debt}}{\text{GNI}} < 50\%$ but $> 30\%$	$\frac{\text{Debt}}{\text{Exports}} < 275\%$ but $> 165\%$	$\frac{\text{DS}}{\text{Exports}} < 30\%$ but $> 18\%$	$\frac{\text{Interest}}{\text{Exports}} < 20\%$ but $> 12\%$
Less Indebted	$\frac{\text{Debt}}{\text{GNI}} \leq 30\%$	$\frac{\text{Debt}}{\text{Exports}} \leq 165\%$	$\frac{\text{DS}}{\text{Exports}} \leq 18\%$	$\frac{\text{Interest}}{\text{Exports}} \leq 12\%$

Table 5. World Bank Indebtedness Classifications for Non-DRS Economies, April 2005. These four key ratios are used to determine indebtedness classifications for economies that do not participate in the Debtor Reporting System (DRS). DS is an abbreviation for debt service.

When a catalog of territories containing biodiversity hotspots is compared to economies' respective indebtedness classifications, the hypothesis that biodiversity losses are significantly pronounced in indebted economies is also supported (Pearson chi-square, df = 1, α for test < 0.005); however, the amount of indebtedness has no statistically significant bearing on a territory's hotspot status (Pearson chi-square, df = 2, α for test < 0.10). It is still noteworthy that the vast majority of hotspot economies (78%) are classified as indebted. Only 30% of all economies housing hotspots fit the Bank's classifications for severe indebtedness, but this segment remains the largest of all possible classifications. Moderately to severely indebted economies combined account for 52% of hotspots as shown in Table 6.

Indebtedness Classification	Percentage of Hotspot Economies	Cumulative Percentage of Hotspot Economies
Severe	30%	Severely Indebted: 30%
Moderate	22%	Moderately to Severely Indebted: 52%
Less Indebted	26%	Classified as Indebted: 78%
Not Classified	22%	

Table 6. World Bank Indebtedness Classifications and Hotspot Economies. The middle column shows the share of hotspot economies that fall in each debt category. The column at right shows the cumulative percentage of hotspot economies included with each debt classification. Severely indebted economies have the highest debt burden. Economies classified as indebted include all economies that do not have a "Not Classified" debt classification.

There are limitations to the conclusions that can be drawn from relationships between indebted territories and hotspot status, since World Bank debt classifications are simply not performed on high-income economies. Undoubtedly such economies fit somewhere in these classifications, as even the US has its share of national debt. Additionally some economies that might very well be severely indebted become part of the "Not Classified" category if indebtedness data is not reported to the Bank. There could be many reasons why an economy does not report debt information. For instance some member countries do not hold loans with the Bank, so they have no reason to share indebtedness information.

To complicate matters, it is unclear how relevant these indebtedness categories are to the research question in the first place, as these categories were

devised to help the Bank make loan and fund decisions – not to gauge the influence of debt on a state's social or environmental health.

5.3 Conclusion

The relationships between biodiversity hotspots and economic poverty and indebtedness were found to be statistically significant. Recall that biodiversity losses were most pronounced in least developed economies (Pearson chi-square, df = 3, α for test < 0.005) and most pronounced in indebted economies (Pearson chi-square, df = 1, α for test < 0.005); however, the amount of indebtedness bore no statistically significant relationship with hotspot status (Pearson chi-square, df = 2, α for test < 0.10). What this means is that connections neo-Marxians have drawn between environmental impacts – in this case, biodiversity loss – and economic poverty are not tenuous. Poor and indebted economies are indeed more likely to rapidly decapitalize their unique natural resources – unintentionally wiping out much of their biodiversity to meet foreign debts and raise the standard of living – just as E.O. Wilson suggested. Additionally, bearing in mind the history of the World Bank and the IMF, many of the economies that are still categorized as indebted and developing have the debt crisis of the 1970s and structural adjustment of the 1980s to thank for their economic situation. It is for these reasons that the way in which international development has been handled bears environmental impact on biodiversity loss.

One might argue that economic poverty simply acts as a proxy for population stress, since both Malthus and Marx identified a close relationship between poverty and overpopulation. However an investigation of Figure 5 and Figure 6[13] demonstrates that population stress alone is insufficient for explaining biodiversity loss. Only hotspots in central and southeast Asia overlap with high population density; all other hotspots beg for an explanatory mechanism.

With a neo-Malthusian explanation to the biodiversity problem shown to be insufficient, and with the statistically significant relationships between biodiversity hotspots and poor economic conditions demonstrated, a neo-Marxian perspective on the biodiversity problem has been shown to be more relevant. Only with such a perspective would one even begin to investigate how biodiversity loss in less developed countries may be due to international development and how it has been practiced. In the next chapter, one special program of the World Bank specifically designed to guard against biodiversity loss will be considered as a case study – the Global Environment Facility.

6 Chapter 6: A Critical Look at One of the World Bank's Reinventions: The Global Environment Facility

As mentioned in chapter 2, the Bank's supporting role in SAPs gave it a negative reputation among social and environmental professionals that the Bank instead hoped would be international development allies. Thus, throughout the late 1980s and 1990s, as hot-button development issues changed from economic stability to humanitarian and environmental impacts, the Bank underwent dramatic bureaucratic transformations in an attempt to be more responsive to the charges of its critics. In its most recent program designs, client countries are now given more of a say in plans for macroeconomic restructuring and in the application of World Bank funds for projects. However it remains to be seen if World Bank policies aiming to preserve accountability, environmental quality, and social welfare actually "have teeth," or if other elements of the world economic system undermine the Bank's best intentions. Bank policies as they relate to issues of biodiversity in particular will be explored by looking at The Global Environment Facility (GEF).

As a special office of the World Bank, the GEF was created by a cohort of World Bank staff and Western European ministry officials in 1990 to finance projects supportive of UN conventions on biological diversity and climate change.[154] A global environmental finance fund of this type was not without precedent, since the Montreal Protocol, the UN agreement to curb the

production and use of ozone-depleting chemicals, was funded by the UN-managed Multilateral Fund.

However the GEF is quite different, for it is an interim financial mechanism of the World Bank. Unlike the Multilateral Fund, which was controlled by all signatories of the Montreal Protocol, the parties with the most power over the GEF are the largest shareholders of the World Bank mentioned in chapter 2 - the US, Japan, Germany, France, and Great Britain.[155] Additionally GEF funds are replenished every three to four years,[156] so this gives the GEF the opportunity to reflect on its progress toward its environmental goals and to modify its operations. As a part of the fund renewal process, the GEF is subject to numerous third-party evaluations as will be discussed.

The GEF is rather sizeable in comparison to other international governmental funds available for environmental protection. For instance, the United Nations Environmental Program (UNEP) had only a third of the GEF's monies available for environmental projects in 2002.[157] Funds for sustainable development, environmental protection, or environmental mitigation projects up to $10 million can be allocated within the Bank, but funds above that amount have to be linked to other World Bank loans and referred to the Bank's governing board, which meets once a year as described in chapter 2.[158]

As a trustee for the environment in the UN system, the UNEP sought to plan priorities for the GEF. Writing from within the agency in 1997, Sheila Aggarwal-Khan expressed the hope that the GEF would be used less as an "add

on" to development projects and more as a transformative facility ensuring that loans for the "least cost option" would be decided on the basis of "total costs to society." The optimism behind this hope was that the GEF could help solve global environmental problems by serving as an example that took account of both social and ecological costs and benefits for reforming the lending process.[159]

To make some account of social and environmental costs for World Bank projects, the Program for Measuring the Incremental Costs for the Environment (PRINCE) was developed in the GEF Secretariat. This process employed a number of mainly UK-educated experts and environmental economists to assess nature's worth and calculate algebraic formulae for incremental costs analyses.[160] Some critics have seen the work of these experts and economists as more of the Bank's old habits – employing technocratic specialists of the West to dictate economic priorities to poorer nations without regard to complex, human realities on the ground.

On the question of representation, as has been characteristic for any World Bank program, the GEF attempts to strike a balance between its best intentions and its image with donor countries.[161] Thus, although it seeks the input of environmental scientists and experts, it also defers to the desires and judgments of representatives for industrialized nations. Similarly the GEF's efforts at transparency and the incorporation of civil society is also a double-edged sword, since NGOs make up a large share of "citizen" representation. However, much like corporations, NGOs are also funded privately by donors. In this sense,

NGOs can also be seen as "beholden" to whomever hands them the largest gifts. It is in this way that spaces granted to NGOs at the table for World Bank funding decisions may unfortunately filter, marginalize, or – at worst – shut out local democratic representation altogether. This could be the case when a limited number of stakeholders are invited to participate in some decision-making process, and the spaces that would be available to local citizen groups are instead snapped up by Washington NGOs.

On its face the GEF shows both promise and shortcomings. Its goals – "[to help] developing countries fund projects and programs that protect the global environment... [supporting] projects related to biodiversity, climate change, international waters, land degradation, the ozone layer, and persistent organic pollutants"[62] – are laudable as are its aims to better represent civil society in funding decisions. Additionally it aims to model funding decisions that could be made with decision criteria that extend beyond the traditional balance sheet. Yet the skewed representation of industrialized countries, as well as the World Bank's continued commitment to the Rostovian model for international development, pose challenges. As will be discussed, voting power within the World Bank has always been bought, and when this decision-making structure was transferred to the GEF, many stakeholders remained disenfranchised. Additionally the Rostovian development model views nature as a resource for economic ends, and not as a resource in and of itself. Therefore environmental management for conservation purposes remains elusive.

6.1 Difficulties During the Pilot Phase, 1990-1994

Evaluations completed by NGOs, academics, and partner organizations including UNEP, UNDP (the UN Development Program), and the World Bank during the GEF's pilot phase, showed the Facility to be falling short on a number of fronts. In the area of transparency, Caufield found "a consistent, biased exaggeration, if not falsification of the amount of consultation and participation with governments, NGOs and affected communities in the project documents."[163] The official Independent Evaluation of the Pilot Phase (IEPP), conducted by consultants for UNEP, UNDP, and the World Bank concurred that recipient countries rarely had as much influence as official GEF documents suggested.[164]

Evaluations also reported that the GEF fell short on integrity. Alex Wood of the Word Wildlife Fund (WWF) found more emphasis to be placed on speedy project approval and implementation than on applying a clearly defined, pro-environment rationale for which projects should most usefully be funded, or how they should be funded.[165] David Reed, another WWF associate, concluded that the GEF sponsored projects "of peripheral relevance to the central development issues that threaten the viability of the biosphere."[166] As an example he cited a GEF-assisted biodiversity project in Vietnam that aimed to mitigate the environmental impacts of previous development mistakes, while no apparent action was taken to prevent such problems in the first place. Fairman echoed that GEF's early international waters projects focused on providing grants for end-of-pipe solutions to pollution – such as treating ship wastes in new port

developments in China – but did nothing to address systemic sources.[167] The IEPP concurred that the GEF was being treated as an add-on to normal World Bank operations – which was precisely *not* what UNEP envisioned the GEF to be.

At a series of meetings spanning from December of 1992 through December of 1993, delegates representing governments participating in the GEF met to discuss replenishing GEF funds and the findings of the critical reviews. One issue that was particularly controversial was that of "efficient and harmonious" decision-making. Part of why decision-making remained so controversial was that the GEF maintained the decision structure of the Bank, where voting power was determined by the number of shares a voter had. A GEF background note for one of its participants meetings proclaimed that "balancing the plurality of interests implicit in universal participation, and the need to give due weight to donors' funding efforts" would be important.[168]

Delegates from developing countries would have liked to see a more representative balance of power in the GEF's decision-making body. They advocated for the major portion of the governing council's seats (20 out of 30 seats to represent developing nations), for the right to elect a chair for each meeting from the representatives present, and for the GEF's work to be subject to the authority of a universal assembly of all government members.[169]

During the December 1993 meeting in Cartagena, G-77 governments walked out of GEF negotiations.[170] Their actual reasons for doing so are shrouded

in some mystery, but one account states that French negotiators, supported by the Germans, were threatening to reduce their share of GEF funding if the governance structure was changed to the liking of developing countries. Later a French delegate, speaking on behalf of the Western European and Others Group (WEOG) of governments at the time, offered a resolution acceptable to G-77 negotiators. Communications overnight with the WEOG capitals revealed that the resolution was actually not acceptable to Western governments, so the next morning, the British delegation – whose turn it was to speak on behalf of the WEOG – retracted the offer. G-77 negotiators saw this as the last straw and called an end to the meeting in protest.

Somehow negotiations got back on track before the GEF pilot phase was set to expire. In March of 1994, the GEF was replenished with $2 billion and restructured such that operations would be reviewed every three years by a Participants' Assembly that represented all member nations. The governing council would be democratic, and the Secretariat would be independent; however, the GEF also retained a permanent co-chair, which would be the Secretariat's CEO, and the World Bank would host the GEF administratively and financially. The World Bank would also run most GEF projects – though the UNEP and UNDP would be considered equal implementing agencies.

6.2 Difficulties in the Restructured GEF

Though all of the aforementioned political details are important, scientific details, like how new dams might affect a local fishing industry dependent upon the ecological services of a river ecosystem, are important too. To ensure that a project is appropriately structured to realize desired environmental benefits, one would hope that the GEF has made room for scientific and technical advice. It has - but the effective integration of such advice is questionable.[171]

The Instrument for the Establishment of the Restructured GEF states that a Scientific and Technical Advisory Panel (STAP) shall serve as an advisory panel to the Facility, and UNEP shall serve as the GEF-STAP liaison. The STAP is a panel of 12 prominent scientists from around the world that meets a few times per year. It is noteworthy that the STAP is an advisory body only, and STAP members cannot make demands of the GEF. Additionally some STAP members have expressed that the GEF Secretariat "select[s] where to listen" to their advice.[172]

Comments from World Bank staff bolster this view. One donor council member stated, "The STAP is not crucial to the GEF."[173] Former World Bank Vice President of the Environment Ken Piddington stated at an Aberdeen conference in 1992 that the STAP was of value primarily because it had an environmental lawyer and an environmental economist as members[174] - no mention was made of the value of natural scientists as advisors, though it is only

natural scientists who are able to address specific questions about water quality, forest management, biodiversity, and the like.

Yet even if the GEF were to appropriately represent all major stakeholders and were to have the science right, interpreting which portions of projects ought to receive funding is not straightforward. This is because the GEF is designed to fund additional or "incremental" costs for environmentally friendly practices. As stated on the GEF web site,

> GEF funds the "incremental" or additional costs associated with transforming a project with national benefits into one with global environmental benefits; for example, choosing solar energy technology over coal or diesel fuel meets the same national development goal (power generation), but is more costly. GEF grants cover the difference or "increment" between a less costly, more polluting option and a costlier, more environmentally friendly option.[175]

Though this appears to be a simple concept, in practice identifying "incremental" costs of this type are quite challenging. Some GEF projects under the Climate and Biodiversity Conventions are entirely comprised of "incremental" costs, since the project would not even be done in the absence of such environmental conventions. This is particularly true for the issue of biodiversity loss, as one NGO observed, "[I]t is extremely difficult, many feel impossible, to distinguish in any measurable or otherwise credible way, between the global environmental benefits and domestic benefits of a biodiversity project."[176]

6.3 Tensions Between the GEF and the Convention on Biological Diversity.

As mentioned in *Difficulties During the Pilot Phase, 1990-1994*, the GEF, UNEP, and UNDP are considered equal "implementing agencies" for projects or portions of projects funded by the Facility. However the GEF has an intimate relationship with the UN Framework on Climate Change (UNFCC) and the UN Convention on Biological Diversity (UNCBD, or CBD) as well. For the purposes of this study, the relationship between the GEF and the UNCBD is of primary interest.

The UNCBD was drafted at the Rio Earth Summit in 1992 and is considered a special secretariat under the purview of UNEP.[77] At the time, rich nations envisioned that the new GEF could act as an interim funding mechanism for UNCBD's initiatives.[78] Within a few years, it became clear that what the GEF thought it should be doing - while under the administrative charge of the World Bank - was quite different from what the UNCBD thought it should. For instance, the UNCBD wanted to target GEF funds to biodiversity hotspots in countries such as Brazil, Indonesia, and Colombia; however, development agencies such as USAID and the GEF Council preferred that all countries receive a share of GEF funds regardless of how much rare biodiversity existed in their borders. Young commented,

> [W]ider implementation of the CBD could win broader political support than the more purely 'global' approach favored by... environmental scientists like Myers and... NGOs like Conservation International."[79]

McAfee added, "The Facility's effort to implement a policy for prioritizing 'global quality' biodiversity has run up against the political reality that the GEF and the CBD are organizations of states, not of scientists."[180]

The cultural divide between statesmen and financiers no doubt also played a role in the increasing tension between the GEF and the UNCBD. The CBD would try to offer the GEF guidance, and the GEF interpreted this vague guidance into something that made sense in economic terms – often taking actions that the CBD hardly intended. The CBD would then respond with pleas for reconsideration of GEF actions.[181] Young concluded,

> [W]hile the GEF's CEO was frustrated by the number of demands placed on his staff [by the CBD], the Convention bodies were even more frustrated... [with] GEF projects that they did not deem the best use of scarce environmental funds.[182]

The irony of the GEF is that it is recognized in the CBD as a financial "mechanism," while the GEF views the parent organization of the CBD – the UNEP – as an equal "implementing agency." During the third Conference of Parties meeting (COP-3) in Buenos Aires, GEF financiers made clear that "only by working with the GEF... could the CBD ensure funding for its global environmental purposes."[183] What this meant was that the CBD would have to be more deferential to the way the Bank did business. On the bright side, cooperation between the CBD Secretariat and the GEF Secretariat did increase after the COP accepted the GEF as CBD's permanent financial mechanism.

6.4 Tensions Between Thinking Globally and Acting Locally

The charge of the GEF is to fund incremental additions to localized projects that should enable global environmental benefits. But fundamental tension exists between local executors of projects and the global professionals of the GEF.[184] First there is the problem of experience. All too often the learned decision-makers of the GEF have limited experience with the locales impacted by projects. At times this ignorance can manifest in almost comical ways. In 1998 a GEF-NGO conference was held in New Delhi to discuss the *India Ecodevelopment* project. Indigenous people from Nagarhole, South India were invited to the proceedings, but they were not permitted to attend the opening reception because none of them had shoes.[185] Additionally there were no translation facilities for their language, so they did not hear the GEF CEO speak about the value of their participation.

Unfortunately the Nagarhole incident is representative of short-sightedness within the GEF. A GEF staff member commented,

> The GEF is not pro-active for indigenous communities.... It should instead target them as beneficiaries. GEF needs to do a lot more work... for example what to do about indigenous people who don't use monetary measures of value? Everybody here in the Bank thinks they know it all about issues like indigenous people and gender, but they rarely even take social scientists in project mission teams.[186]

Young sensed that despite the high hopes for the GEF, there would always be a ceiling to its progressive efforts, since as a relatively young supranational organization, there could be real political consequences for "empowering citizens at the grass roots at the expense of governments,

international consultants, and aid project managers."[87] Political consequences could include local upsets of governmental systems, which, in turn, upset project goals and donor countries. All of this implies that the GEF will always have its donors' interests in the back of its mind. A staff member with the UNCBD reflected,

> [T]he World Bank is well established and has more money than it knows what to do with, while the GEF is new and fragile, always with an eye on the next donor replenishment, so it can't be seen to step out of line.'[88]

6.5 Conclusion

As a case study, the GEF reveals that the tensions that have plagued the Bank since its inception continue to this day. Historically the Bank was created to help business do business on its own terms, and though the advocates of the GEF hoped that the Facility would give the Bank a green thumb, it has been little more than an add-on program that mitigates environmental problems created by primary infrastructural and investment projects inspired by the Rostovian development framework. The GEF maintains important administrative and structural ties to the World Bank, which dampens its ability to be as experimental as proponents seem to desire. This happens because, at all times, the GEF, both by political and structural necessity, must bear in mind the interests of its donor countries.

The integration of scientific and technical advice for achieving the ends of environmental conservation has also been spotty. World Bank institutions are not accustomed to heeding the advice of ecologists, let alone the advice of

anthropologists or sociologists who could shed light on the behavioral dimensions of human impacts on biodiversity. The GEF has shown itself to be no exception in this regard. Additionally the manner in which GEF funds are to be used is very specific, only for additional or "incremental" costs for environmentally friendly practices in projects that provide "global" as opposed to local benefits. Despite the specificity of this definition, it is notoriously difficult to interpret - particularly for projects designed to mitigate biodiversity loss.

Young concluded that the GEF simply may have been too ambitious a project because it was entrusted with conflicting objectives including offering financial support to UN Conventions, towing the line on Rostovian development theory, bridging the gap between the business world and civil society, and reforming both the 'efficient' World Bank and the 'democratic' UN "to give each more of the other's attributes - without undermining their comparative advantage."[89] She wrote,

> In this experimental context, risk aversion combined with the search for consensus and a good public image [meant] that the GEF Council had more money than it was effectively able to spend according to its own demanding rules.'[90]

Unfortunately the reality of these difficulties has been much pomp and circumstance with little result. In the words of former GEF CEO El-Ashry,

> ...[D]uplication, fragmentation and competition for scarce [fiscal] resources - fundraising gimmicks if you will. And despite all the fancy brochures and reports that fill our shelves, the state of the world environment continues to deteriorate.'[91]

7 Chapter 7: Conclusions

This thesis explores how biodiversity loss negatively impacts human societies, and establishes that biodiversity loss is most pronounced in least developed economies. Due to the links between a territory's economic status and the presence of biodiversity hotpots, this thesis also explores historical and philosophical reasons for why the very business of international development may be behind such environmental impacts. As one of the oldest and most influential development institutions, The World Bank is studied as a development actor and possible catalyst for making international development more environmentally friendly. In its most recent program initiatives, the Bank has attempted to be more environmentally conscientious, and The Global Environment Facility (GEF) is a case in point. Additionally the GEF is a particularly relevant case study for the biodiversity loss problem because it is a permanent funding mechanism for the enforcement of the UN Convention on Biological Diversity.

Under the GEF, changes in development practices have been largely superficial. Donor countries still control decisions for aid disbursement. Additionally tension surrounds what types of projects should receive GEF funding – projects that protect local biodiversity or "global" biodiversity. In biodiversity hotspots, these are one and the same, but so long as the GEF mulls over how to interpret its charge, no action is taken – allowing biodiversity to erode away.

Part of the difficulty may be that the biodiversity loss problem is often couched in neo-Malthusian terms, where human population pressure is believed to be the primary cause of environmental degradation. However this thesis demonstrates through a statistical analysis of the connection between poor economic conditions and biodiversity loss that a neo-Marxian perspective may be more useful. Population pressure alone was shown to be insufficient for explaining biodiversity loss worldwide, since many biodiversity hotspots lack high population densities. Instead economic conditions were found to hold a statistically significant relationship with biodiversity loss – demonstrating that a neo-Marxian view of the problem may be more appropriate.

With a neo-Marxian view of biodiversity loss, questions regarding social and economic justice must be part of the environmental discussion. With the relevance of this paradigm established, one can return to the historical and philosophical views of international development during the 20th century and glean more insights.

Though proponents of international development were quite ambitious during the 1960s (people thought the "developing world" would "take off" as quickly as formerly war-torn Europe), they lacked perspective on the necessity of fulfilling social preconditions for economic take-off such as fair terms of trade, humane development of urban populations, growth of a domestic technology sector (which in turn requires an educated portion of the local populace and technology transfer programs), and opportunities for upward mobility (which

were not possible in corrupt dictatorships). Instead development experts focused on other aspects of Rostovian development, such as establishing the institutional infrastructure for financing, attracting foreign investors, and developing natural resource sectors such as agriculture and mining. Additionally Rostovian development theory views the environment only as a natural resource base for economic activity. Careful management of this resource base is not explicitly discussed – implying that environmental management is not a priority of institutions that lend money for economic development either.

Development efforts went particularly awry during the Cold War because industrialized superpowers – the US and the USSR – were more concerned with expanding their spheres of influence than they were with actually helping newly independent nations develop. Thus no concerted efforts were taken by "neutral" development agencies or the superpowers themselves to battle corruption. As a result, many development funds were squandered by rogue governments, and the seeds of democracy – which Rostow also believed would be important for successful economic take-off – were never planted.

During the energy crises of the 1970s, shocks to the international monetary system hit poor, developing nations particularly hard, since many of them also held variable-interest loans from private banks. This changed the economic balance sheets of many developing countries overnight, further retarding their development efforts. Under the pressure of the IMF to continue paying back interest on these large loans, many countries actually backslid in their

development. Social programs designed to ease the social impacts of economic transition - such as government-sponsored health care in crowded slums - were scaled back or shelved. Public investments in government-owned industry were also forced to be sold under conditions outlined for emergency loans by the IMF.

Ever since the IBRD finished its development work with war-torn Europe, the World Bank has walked a fine line between its role as a development institution and its role as a major player in the international monetary system.[92] On many institutional fronts, the Bank appears to exist more for its donor countries' interests and less for developing countries. For instance, by tradition, the World Bank has always been headed by an American, while the IMF has always been headed by a European.[93] Bretton Woods has also remained steadfast to its historical position that any economies finding they require IMF help for any reason are subject to strict macroeconomic restructuring, making balance-of-payments problems solely the domain of troubled economies - and not of the parties who lent private funds.

What this all means is that if the Bank is serious about changing its development legacy and contributing meaningfully to the biodiversity loss problem, it must make changes on more fundamental levels. As the neo-Marxian perspective points out, alleviation of the social conditions that give rise to poor quality of life (and hence pronatalist pressures) must be addressed. This may require social impact assessments in addition to environmental ones. It also insinuates that social scientists, who are not just economists, be consulted.

Improving local quality of life will certainly require greater political accessibility by communities most affected by development projects to programs like the GEF. Currently the GEF does not take local outreach very seriously, and from a neo-Marxian perspective, this is a big mistake.

However some critics also argue that any internal changes the World Bank attempts will make little difference, since the Bank is only one player in a larger global economic system. As a development institution, the World Bank is eager to fund projects that help LDCs build infrastructure and establish an amenable climate for new investors and financial markets; however, the Bank is not the only funding source available to projects or start-up companies. Recently private investments have become the main source of funds to developing countries.[194] Thus although the World Bank has been a clear actor in the world economic system over the past 60 years, any immediate impact from its internal policy changes become questionable once its relatively small financial role in the large, globalized financing market is realized.

To complicate matters, the move of industrialized countries to "service economies" may characterize an entirely new focus of the market system.[195] What this means is that "the invisible hand" of the market could give rise to incredible, decentralized resistance against efforts to preserve biodiversity due to the nature of consumer demands in industrialized economies. The explosion of both low-cost and high-end retailing vis-à-vis stores such as WalMart and Whole Foods is a byproduct of the service economy transition and signifies what Weaver terms a

new economy based on *stages of labor* in addition to goods. Not only do consumers want material goods, but they want it at a substantial discount from the manufacturer's suggested retail price, available only from WalMart or Target. Meanwhile consumers able to afford more expensive products desire not only fresh romaine lettuce in the summer, but organic, pre-washed salad mix in the winter. This translates to a lifestyle that demands stages of labor that never existed before – labor that is superexploitable for cheap goods and labor in faraway lands that can deliver goods that are locally unavailable due to seasonality or other factors.

The only places where this type of labor can be bought are LDCs. Though the shift to a stages-of-labor economy provides benefits such as ubiquitous low-cost goods and economic development, it also poses challenges. Demand by consumers in rich nations for the aforementioned new-niche amenities drives the conversion of virgin land and subsistence communities in developing countries to agriculture and industry. Countries with unique natural resources – like mangosteens[196] in Indonesia or green iguanas[197] in South America – abandon cultivation of these local goods to instead push out more familiar products to Western consumers such as beef from cattle. Wille and Jukofsky noted,

> [I]f you're a farmer [living in the rainforest] with a family to feed,... you're likely more interested in chopping or burning down the trees on your land to make way for cattle or crops – something you can sell. After all, iguanas make a delectable dinner, but they won't keep the kids in clothes.'[198]

This serves as an example of the economic and environmental choices many people living in developing economies must make.

Taken together, the current structure of international financing and the direction of the new global economy reveal how daunting conservation of biodiversity hotspots will be. The forces that influence land conversion are highly decentralized and connected to international market fluctuations.[199] However it would be a mistake to think that institutional changes at an organization like the World Bank go unnoticed. Bretton Woods institutions have historically been at the center of institutional power on the world development scene, and Bretton Woods legitimizes certain ways of looking at States and markets. [200] As the guerrilla satirists The Yes Men have shown through their various antics – posing as representatives from the World Trade Organization and other organizations at professional conferences and in televised interviews – business and governmental leaders, as well as academics, take many cues for advancing globalization and economic development from these types of multilateral agencies.[201] What this means is that in its attempt to integrate social and environmental responsibility into its development practices by starting new programs like the GEF, the World Bank has taken a step in the right direction. But to truly make a difference, the Bank must remain vigilant in its transformations and be willing to make much more fundamental changes, since it has a long historical legacy and much institutional inertia to overcome.

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[3] Wilson, 328.
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[5] Wayne Ellwood, *The No-Nonsense Guide to Globalization* (Oxford: New Internationalist Publications Ltd, 2001; reprint, 2004), 24-27. Not all agree that this was the aim of Bretton Woods architects. It could also be argued that delegates were primarily concerned with saving capitalism, since the Great Depression and global recession showed how devastating economic failures under capitalism could be. See *Wikipedia, The Free Encyclopedia*, s.v. "Bretton Woods system," 5 June 2005, <http://en.wikipedia.org/wiki/Bretton_Woods_system> (6 June 2005).
[6] Ellwood, 28-32, and *Wikipedia, The Free Encyclopedia*, s.v. "Bretton Woods system."
[7] US Congress, House of Representatives, Committee on Foreign Affairs, "Environmental Impact of World Bank Lending (Vol. I)," 101st Congress, 1st Session, September 26, 1989, 58.
[8] The World Bank, *A Guide to The World Bank* (Washington, DC: The International Bank for Reconstruction and Development/The World Bank, 2003), 8-9.
[9] The World Bank, *A Guide to The World Bank*, 4.
[10] Zoe Young, *A New Green Order? The World Bank and the Politics of the Global Environmental Facility* (Sterling, Virginia: Pluto Press, 2002), 23.
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[12] Representation is primarily by region, though there are some countries that are represented by executive directors from outside regions. Countries for which this is the case include Algeria (Middle East), Cambodia (Australia), Ghana (Middle East), Guyana (North America), Ireland (North America) Israel (Europe), Korea (Australia), Maldives (Middle East) Mongolia (Australia), Spain (South America), The Philippines (South America), Timor-Leste (Europe), and Tunisia (Middle East). The World Bank, *A Guide to The World Bank*, 170-171.
[13] The World Bank, *A Guide to The World Bank*, 8-9, 169-171.
[14] The World Bank, *A Guide to The World Bank*, 8-9, 172-173.
[15] The World Bank, *A Guide to The World Bank*, 19.
[16] The World Bank, *A Guide to The World Bank*, 21.
[17] The fact that World Bank and IMF leadership have always been, by tradition, an American and a European is a point of criticism by authors Zoe Young, Wayne Ellwood, and Maggie Black, as well as by the non-profit advocacy group 50 Years is Enough - whose namesake was based upon the age of the Bretton Woods institutions when the advocacy group was founded.
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[23] *Wikipedia, The Free Encyclopedia*, s.v. "NATO," 25 Apr 2005, <http://en.wikipedia.org/wiki/NATO> (25 April 2005).

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[26] *Wikipedia, The Free Encyclopedia*, s.v. "Bandung Conference," 24 April 2005, <http://en.wikipedia.org/wiki/Bandung_Conference> (25 April 2005).
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[28] *Ibid.*
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[30] *Wikipedia, The Free Encyclopedia*, s.v. "Non-Aligned Movement," 24 April 2005, <http://en.wikipedia.org/wiki/Non-Aligned_Movement> (25 April 2005).
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[32] Black, 18.
[33] The World Bank, *A Guide to The World Bank*, 16.
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[35] *Wikipedia*, s.v. "Non-Aligned Movement."
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[37] US Census Bureau, International Data Base. 24 August 2006, <http://www.census.gov/ipc/www/idbagg.html> (17 March 2007). Table 001: Total Midyear Population, Area, Density; aggregated by Population and Region: World and Less Developed Countries.
[38] Noam Chomsky, *What Uncle Sam Really Wants* (Berkeley: Odonian Press, 1992), 19, asserts, "In one high-level document after another, US planners stated... that the primary threat to the new US-led world order was Third World nationalism...." He points to National Security Council Memorandum 5432 (1954) as evidence. He also elaborates this claim in his book, *On Power and Ideology: the Managua Lectures*, Lecture 1.
[39] Weaver, 207.
[40] As Black (19) puts it, "[T]he idea that a decade might see the task almost through... did not then appear so far fetched. Many a 20th-century miracle had been accomplished in less."
[41] The prolific Noam Chomsky has written at length about the Cold War relationships between the United States and many corrupt regimes in developing countries. See also Young, 23.
[42] The World Bank Group, "Pages from World Bank History: The Pearson Commission," 2005, <http://web.worldbank.org/WBSITE/EXTERNAL/EXTABOUTUS/EXTARCHIVES/0,,contentMDK:20121526~pagePK:36726~piPK:36092~theSitePK:29506,00.html> (5 May 2005), and Black, 20.
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[44] Lester Pearson and Robert C. Leffingwell lectures for the Council of Foreign Relations 1969 (Pall Mall Press, 1971), referenced in Black, 20.
[45] Kapur et al., 215-268.
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[47] Weaver, 214.
[48] Black, 23 and Ellwood, 38.
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[52] *Wikipedia, The Free Encyclopedia*, s.v. "1979 energy crisis," 25 April 2005, <http://en.wikipedia.org/wiki/1979_energy_crisis> (21 June 2005).
[53] Kapur et al., 598; also Weaver, 214.
[54] Weaver, 215.

[55] Ellwood, 43.
[56] Weaver, 215.
[57] Ellwood, 29, and *Wikipedia*, s.v. "Bretton Woods system"
[58] Ellwood, 46-48, and Weaver, 216.
[59] Kapur et al., 682.
[60] Weaver, 216.
[61] A listing of the 43 IMF-approved structural adjustment loans appears in chap. 14 of *Silent Revolution: The IMF from 1979-1989*, 674-676. Most structural adjustment programs overseen by The World Bank were joint projects with the IMF, but some countries worked solely with the Bank.
[62] Black, 24-25, and The World Bank, *World Development Report 1999/00* referenced in Ellwood, 48.
[63] Black, 24-25.
[64] Black, 25
[65] *Economic Justice Report*, Ecumenical Coalition for Economic Justice, Vol. X, No 4, December 1999 referenced in Ellwood, 47.
[66] For detailed discussions of how Bank presidents felt about the institutions poor reputation, see Devesh Kapur, John P. Lewis, and Richard Webb, *The World Bank: Its First Half Century, Volume 1: History* (Washington, DC: Brookings Institution Press, 1997).
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[69] John Garrison and Teresa Aparicio, "The Challenges of Promoting Participatory Development in the Amazon" in World Bank Publications on Civil Society Engagement, September 2005 <http://web.worldbank.org/WBSITE/EXTERNAL/TOPICS/CSO/0,,contentMDK:20098376~menuPK:277367~pagePK:220503~piPK:220476~theSitePK:228717,00.html> (17 March 2007). The Garrison Aparicio note can be accessed directly at <http://siteresources.worldbank.org/CSO/Resources/PlanafloroCaseStudy.pdf>.
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[71] US Congress, "Environmental Impact of World Bank Lending (Vol. I)," 51-56.
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[73] The World Bank, *A Guide to The World Bank*, 154.
[74] Young, 6.
[75] The World Bank, *A Guide to The World Bank*, 154.
[76] The World Bank, *A Guide to The World Bank*, 155.
[77] The World Bank, *A Guide to The World Bank*, 57-58.
[78] The World Bank, *A Guide to The World Bank*, 78-79, 156.
[79] The World Bank, *A Guide to The World Bank*, 155.
[80] *Ibid.*
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[82] W. W. Rostow, *The Stages of Economic Growth: A Non-Communist Manifesto*, 3rd ed. (New York: Cambridge University Press, 1990; reprint, 1993).
[83] Timothy J. Yeager, *Institutions, Transition Economies, and Economic Development* (Boulder, CO: Westview Press, 1999), 17-23.
[84] See John Cassidy, "Always with Us?" Interview with Jeffrey Sachs in *The New Yorker*, April 11, 2005.
[85] See Maggie Black's *The No-Nonsense Guide to International Development* (Oxford: New Internationalist Publications Ltd, 2002),

[86] Rostow, xxiii-xxiv.
[87] Rostow, 71.
[88] Rostow, 72.
[89] Rostow, 165.
[90] Rostow, 142.
[91] Wilson, 393, and William P. Cunningham and Mary Ann Cunningham, *Principles of Environmental Science: Inquiry and Applications*, 2nd ed. (New York: McGraw-Hill, 2004), 107.
[92] Wilson, 198-199.
[93] Wilson, 261-263.
[94] Conservation International, "Biodiversity Hotspots: Key Findings," 2005 <http://www.biodiversityhotspots.org/xp/Hotspots/hotspotsScience/key_findings/> (11 May 2005).
[95] Wilson, xvii, 253.
[96] Stephen H. Schneider, *Laboratory Earth: The Planetary Gamble We Can't Afford to Lose* (London: Weidenfeld & Nicolson, 1996), 103.
[97] Paul Ehrlich referenced in Cunningham & Cunningham, 111; also Wilson, 189, 280.
[98] Wilson, 281, 283, 287, 304-310.
[99] The wide spread in the estimation of existing species is due to the fact that most identified species are arthropods (insects, crustaceans, spiders) and plants. Additionally the microbiological world consists of great biodiversity still being discovered ("It is obvious that microbiologists will not run out of work for a couple of centuries." Jostein Goksøyr quoted in Wilson, 144). Also Wilson, 132-134.
[100] Wilson, 243-244.
[101] Wilson, 255.
[102] Cunningham & Cunningham, 107.
[103] Gretchen Daily, *Nature's Services: Societal Dependence on Natural Ecosystems* (1997) referenced in Geoffrey Heal, *Nature and the Marketplace: Capturing the Value of Ecosystem Services* (Covelo, CA: Island Press, 2000), 2.
[104] Cunningham & Cunningham, 110.
[105] Heal, 17-18 and Hearst Communications, Inc., "Recycling Biosphere 2," in *Popular Mechanics*, 1 August 1997 <http://www.popularmechanics.com/science/research/1281636.html?page=1&c=y> (8 May 2005).
[106] Wilson, 285.
[107] Cunningham & Cunningham, 108.
[108] Wilson, 286-287; Cunningham & Cunningham, 110; Heal, 95-96, 101-105.
[109] "Organisms are superb chemists. In a sense they are collectively better than all the world's chemists at synthesizing organic molecules of practical use. Through millions of generations... each species has experienced astronomical numbers... of genetic recombinations.... The experimental products thus produced have been tested by the unyielding forces of natural selection, one generation at a time." Wilson, 285.
[110] *Ibid.*
[111] For a discussion of the many cultural, legal, and political struggles that surround bio-prospecting, see Vandana Shiva's *Biopiracy: The Plunder of Nature and Knowledge* (Boston: South End Press, 1997).
[112] E.O. Wilson referenced in Cunningham & Cunningham, 111.
[113] *Ibid.*
[114] Heal, 108-110.
[115] Wilson, 287.
[116] Wilson, 287; Cunningham & Cunningham, 108.
[117] Jean L. Marx, "Amaranth: A Comeback for the Food of the Americas?" in *Science*, 198:40 (1977) referenced in Wilson, 293.
[118] Wilson, 304.

[119] *Wikipedia, The Free Encyclopedia*, s.v. "Eagle feather law," 4 Feb 2007, <http://en.wikipedia.org/wiki/Eagle_feather_law> (1 April 2007).
[120] Cunningham & Cunningham, 110-111.
[121] Wilson, 305.
[122] *Ibid.*
[123] Wilson, 349-351.
[124] Wilson, 351.
[125] William J. Barber, *A History of Economic Thought* (New York: Penguin Books, 1967; reprint, 1984), 57-58. Shortly before the publication of Malthus' paper, legislation was introduced to actually encourage large families. William Godwin, an advocate for population growth, claimed that more people with the ability to be happy increased total happiness. The prevailing assumption was that human population growth was slow ("...Gregory King, the pioneer national income statistician... predicted in 1696 that the population of England would be unlikely to double in less than six hundred years...."), and the first comprehensive enumeration of Britain's population wouldn't occur until 1801.
[126] Barber, 57-60.
[127] Barber, 59-60.
[128] Barber, 59, 73. Malthus believed that humans were naturally inclined toward debauchery and laziness. Though he sounded a cautionary note on the question of population, he was opposed to birth control because he believed a combination of low wages and family pressures helped people overcome their natural tendencies. He believed that marriage and parenthood inspired diligent work, while meager wages would prevent large families. However demographers now see limited upward social mobility as a condition that promotes childbearing.
[129] Barber, 63.
[130] Cunningham & Cunningham, 78; also *Wikipedia, The Free Encyclopedia*, s.v. "Charles Darwin," 8 May 2005, <http://en.wikipedia.org/wiki/Charles_Darwin> (10 May 2005). Carrying capacity is an ecological concept rooted in Darwinian ones such as natural selection, selective pressure, and density-dependent population limiting factors. Though neo-Malthusians often argue that biology and ecology is on their side, it is worth noting that Darwin's theories were actually influenced by Malthus' views on human population.
[131] Cunningham & Cunningham, 79.
[132] Garret Hardin quoted in Cunningham & Cunningham, 89-90.
[133] Barber, 127; Cunningham & Cunningham, 79; *Wikipedia, The Free Encyclopedia*, s.v. "Das Kapital," 27 Apr 2005, <http://en.wikipedia.org/wiki/Das_Kapital> (12 May 2005).
[134] Karl Marx, *Capital*, vol. 1 (1912): 692-693, quoted in Barber, 127.
[135] The details of what makes Marx's argument work are of course left out here. Barber, 117-162 offers a good primer on Marxian economics and the significance of this work.
[136] *Wikipedia, The Free Encyclopedia*, s.v. "Population modelling," 16 June 2007, <http://en.wikipedia.org/wiki/Population_modeling> (08 Aug 2007), and s.v. "Pierre François Verhulst," 01 Aug 2007, <http://en.wikipedia.org/wiki/Pierre_Fran%C3%A7ois_Verhulst> (08 Aug 2007).
[137] Ecologists have divided organisms into two reproductive categories: r-adapted and K-adapted. Organisms that are r-adapted reach sexual maturity quickly, reproduce often, and have many offspring. Typically the offspring of r-adapted species are not nurtured. Examples of r-adapted organisms include weeds, insects, and small rodents. K-adapted species are long-lived and take years to reach sexual maturity. They reproduce infrequently and have few offspring. Typically the offspring of K-adapted species are nurtured. Examples of K-adapted organisms include many top predators such as tigers and birds of prey. Other large megafauna such as elephants and panda bears are K-adapted. For more discussion see Cunningham & Cunningham, 63-64.
[138] Karl Marx, *Capital*, vol. 1 (1912): 554, quoted in Barber, 136-137.
[139] Marx argues specifically that it is the capitalist modes of production that create poverty.

[140] Barber, 141. Barber argues that Marx would have rejected market interventions, such as India's decision to restrict the introduction of modern technologies to products that do not compete with established manufacturing, because of his economic determinism. "Within [Marx's] perspective, policy measures designed to alter the course of history were inevitably fruitless and vain."
[141] Cunningham & Cunningham, 86-87.
[142] John Bellamy Foster, *The Vulnerable Planet: A Short Economic History of the Environment* (New York: Monthly Review Press, 1999), 30. By substituting definitions in for A and T, the identity becomes Impact = Population * (capital stock/person * throughput/capital stock) * (energy/throughput * environmental impact/unit energy). Environmental impact can be measured in many types of units. Examples include species loss, global warming potential, or tons of mercury.
[143] Foster, 30-31.
[144] According to The Gapminder World 2006 tool (accessed 10 Aug 2007), in 2004 the vast majority of the world averaged three children per woman or less – a huge improvement over the demographic state of the world in 1960, when many countries averaged about 6.5 children per woman. It is arguable that a worldwide demographic transition is already occurring, but it is far from complete. Note that by 2004, the United States averaged 2.04 children per woman, and Japan only 1.29 children per woman. Indian women by comparison, at 2.88 children per woman, still have 40% more children than Americans and 120% more children than the Japanese. For more see http://tools.google.com/gapminder.
[145] Conservation International, "Biodiversity Hotspots: Key Findings."
[146] Wilson, xvii, 253.
[147] Stephen H. Schneider, *Laboratory Earth: The Planetary Gamble We Can't Afford to Lose* (London: Weidenfeld & Nicolson, 1996), 103.
[148] Conservation International, Biodiversity Hotspots, 2005 <http://www.biodiversityhotspots.org/xp/Hotspots/> (11 May 2005).
[149] Conservation International, "Biodiversity Hotspots: Resources," 2005 <http://www.biodiversityhotspots.org/xp/Hotspots/resources/maps.xml> (11 May 2005).
[150] Income and debt classifications, as well as explanations for their calculations, were retrieved from The World Bank Group, "Country Classification," 2005, <http://www.worldbank.org/data/countryclass/countryclass.html> (27 May 2005).
[151] Quotation taken directly from The World Bank Group, "A Short History [of Country Classification]," 2005, <http://www.worldbank.org/data/countryclass/history.htm> (27 May 2005).
[152] Though developing economies should not be lumped together as the "poorest" economies in the world, they are likely to have goals for increased standards of living as common characteristics.
[153] SEDAC: Socioeconomic Data and Applications Center, Gridded Population of the World and the Global Urban-Rural Mapping Project, 2007 < http://sedac.ciesin.org/gpw/global.jsp# > (31 March 2007).
[154] The World Bank, *A Guide to The World Bank*, 154, and Young, 6, 16.
[155] Young, 6-7.
[156] Young, 81.
[157] Young, 8.
[158] Catherine Caufield, *Masters of Illusion: The World Bank and the Poverty of Nations* (London: Pan, 1996) referenced in Young, 57.
[159] Young, 59.
[160] Young, 78.
[161] Young, 10-11.
[162] Global Environment Facility homepage, 2006 < http://www.gefweb.org/index.html> (7 April 2007).
[163] Caufield referenced in Young, 82.
[164] Young, 85.

[165] Young, 60, 82.
[166] David Reed (ed.), *The Global Environment Facility: Sharing Responsibility for the Biosphere* (Washington, DC: WWF International Institutions Policy Program, 1991 (Vol. 1), 1992 (Vol. 2)) referenced in Young, 82.
[167] David Fairman, "Increments for the Earth: The GEF" in Marc A. Levy (ed.) *Institutions for Environmental Aid: Pitfalls and Promise* (Cambridge, Massachusetts: MIT Press, 1996) referenced in Young, 83, 2n.
[168] GEF/PA.93/97, "The GEF and the Evaluation: Learning from Experience and Looking Forward," background note for the GEF participants meeting, Cartagena, Colombia, December 1993 referenced in Young, 86.
[169] Young, 88-89.
[170] Young, 90.
[171] Young, 110-112.
[172] Young, 110.
[173] *Ibid.*
[174] Young, 111, 34n.
[175] Global Environment Facility, "Operational Policies," 2006 <http://www.gefweb.org/Operational_Policies/Eligibility_Criteria/Incremental_Costs/incremental_costs.html> (8 April 2007). See also Young, 116.
[176] RESOLVE, *Progress on Incremental Costs Issues Assessment: Incremental Cost Determination for GEF-Funded Projects*, GEF/C.12/Inf.4., 1998 referenced in Young, 117.
[177] Convention on Biological Diversity, "The Convention on Biological Diversity," n.d., <http://www.biodiv.org/convention/default.shtml> (8 April 2007) and United Nations Environment Programme, n.d., <http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=43&ArticleID=234&l=en> (8 April 2007).
[178] Young, 119-120.
[179] Young, 120.
[180] Kathleen McAfee, *Biodiversity and the Contradictions of Green Developmentalism*, 1999, PhD dissertation, University of California, Berkeley referenced in Young, 121.
[181] Young, 121-122.
[182] Young, 122.
[183] Young, 126.
[184] Young, 195-196.
[185] Young, 196-197.
[186] Young, 198.
[187] Young, 201-202.
[188] *Ibid.*
[189] Young, 210.
[190] *Ibid.*
[191] Young, 230.
[192] As discussed in US Congress, House of Representatives, Committee on Foreign Affairs, "Environmental Impact of World Bank Lending (Vol. I)," 101st Congress, 1st Session, September 26, 1989; "Environmental Impact of World Bank Lending (Vol. II)," October 4, 1989; and Devesh Kapur, John P. Lewis, and Richard Webb, *The World Bank: Its First Half Century, Volume 1: History* (Washington, DC: Brookings Institution Press, 1997).
[193] The World Bank, *A Guide to The World Bank*, 10.
[194] UNICEF and the World Bank, *State of the World 2002* in Black, 62.
[195] Weaver, 216 - 219.
[196] Cunningham & Cunningham, 109. Mangosteens have been called "the world's best-tasting fruit," but they are virtually unheard of outside of the tropics where they naturally grow.
[197] Wilson, 296. Wilson notes that green iguanas have been a traditional native food for 7,000 years.

[198] Chris Wille and Diane Jukofsky, "Savory 'Chicken of the Trees' Could Play a Role in Saving Forests," *Canopy* (Rainforest Alliance), Summer 1991, 7 quoted in Wilson, 295-296.
[199] Hilary F. French, "Investing in the Future: Harnessing Private Capital Flows for Environmentally Sustainable Development," World Watch Paper 139, 1998, 19-24.
[200] Gosovic (1992) in Young, 21, called the IMF and World Bank 'the centre of institutional power on the world development scene and the extension of the national policies and ideologies of their major shareholders.' See also Young, 28.
[201] The Yes Men, WTO, n.d., <http://www.theyesmen.org/hijinks/wto.shtml> (6 April 2007).