

SEEDS OF MODERNIZATION: CONFLICTING ROLES OF AGRICULTURE AS
THE CORE DEVELOPMENT AND GROWTH STRATEGY IN SENEGAL

A Thesis

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ABSTRACT

Modern development strategies, as defined by the World Bank, IMF, and other leading financial institutions, perceive agriculture as a viable source of economic growth in developing countries. However, in countries like Senegal which suffer from declining environmental conditions, agriculture is not a sustainable solution for economic growth.

Growth in industrial activity during the colonial era and in the decades following independence have affected rain patterns, soil quality, and water salinity in the Sahel region, making it unsuitable for continued mass production of colonial crops like cotton, groundnuts, and maize. As a result, economic growth has been challenging, and domestic food security has become a major concern. Indigenous knowledge of farming practices could be a solution to these problems by leveraging tradition and local understanding of the environment. Other industries like manufacturing and IT services could also be explored as alternative sources of growth for the economy.

However, the more common strategy has been to continue focusing on agriculture and using more fertilizers, pesticides, hybrid seeds, and in some cases, genetically modified seeds to boost agricultural production and thus meet development goals. Not only is the use of these products harmful to the environment and potentially to people who consume the products, but it is also harmful to the economy. Since most of these products are privatized and patented, traditional farmers are forced to purchase seed and other agricultural products every year from private corporations. Even though many times the increased agricultural production does positively affect the GDP, a major indicator of economic growth to development agencies, more and more farmers are finding themselves in debt. Therefore, the perceived success of

these development programs is at the expense of the livelihood of local farmers, who continue to experience a sub-par quality of life.

This thesis challenges the notion of development, especially as it relates to the African experience of capitalism. Agriculture, as a main vehicle of colonial expansion in Africa and many other places in the world, provides an interesting lens into the fundamental assumptions of capitalist expansion. Ideas of ownership, modernity, and tradition are questioned, using the history of Senegal and its role as a major agricultural hub during and after colonialization. Increasing biodiversity in agricultural practices and focusing mostly on domestic food security while turning to other industries to provide economic growth, such as IT services or manufacturing, may be steps in the right direction.

BIOGRAPHICAL SKETCH

Saira Raza received her B.A. in International Studies from Wells College in 2002 and completed course work for the M.P.S. of African and African-American Studies in 2004. In 2000, she spent six months in Dakar, Senegal, studying at Université Cheikh Anta Diop and working at Consumers International West Africa. She returned to Dakar in 2001 to work at Africare Senegal, developing literacy programs for women in the Casamance region. After moving to Brooklyn, New York in 2004, she joined Americorps and served as a college counselor at Pace University's Upward Bound Program, while attending CUNY Queens College's Graduate School of Library and Information Science. Saira worked as the technology research specialist in the corporate library and the Office of the Chief Information Officer at Lehman Brothers from 2005 until Barclays Capital acquired the company in 2008.

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LIST OF ABBREVIATIONS

ARAF	Association Régionale des Agriculteurs de Fatick (Regional Association of Farmers of Fatick)
AIDS	Acquired Immunodeficiency Syndrome
<i>Bt</i>	<i>Bacillus thuringiensis</i>
CRM	Customer Relationship Management
DISEM	Division de Semences (Senegal's Ministry of Agriculture's Division of Seeds)
FAO	Food and Agriculture Organization of the United Nations
FED	Fonds Européen de Développement (European Development Fund)
FMDR	Fond Mutuel de Développement Rural (Mutual Fund for Rural Development)
GATT	General Agreement on Trade and Tariffs
GDP	Gross Domestic Product
GIE	Groupement d'Interêt Général
GM	Genetically Modified
HDI	Human Development Index
HIPC	Heavily Indebted Poor Countries
HIV	Human Immunodeficiency Virus
HRV	High Response Varieties
HYV	High Yield Varieties
IBDR	International Bank of Development and Reconstruction (The World Bank)
IMF	International Monetary Fund
ISRA	Senegalese Institute for Agricultural Research

IT	Information Technology
NEPAD	New Partnership for Africa's Development
NRC	National Research Council
PDS	<i>Parti Démocratique Sénégalais</i> (Senegalese Democratic Party)
PPP	Purchasing Power Parity
PRSP	Poverty Reduction Strategy Paper
RISSO	Association des Jeunes RISSO (RISSO Youth Association)
SAP	Structural Adjustment Program
SEDAB	Sahéliennes d'Entreprises de Distribution et d'Agro-business (Sahelian Agribusiness and Distribution Business Organization)
TRIPS	Trade-Related Aspects of Intellectual Property Rights
UGIE	L'Union des GIE des Ententes des Groupements Associés du Sénégal
UN	United Nations
UNCAS	L'Union Nationale des Coopératives Agricoles du Sénégal (National Union of Agricultural Cooperatives of Senegal)
UNDP	United Nations Development Programme
USAID	United States Agency for International Development
WTO	World Trade Organization

CHAPTER 1

INTRODUCTION

Statement of Purpose

In the twenty-first century, contradictions in the capitalist system¹ as well as fundamental cultural clashes between Europe and its former colonial subjects have erupted into dual crises of debt and ecological destruction in Africa. These crises are affected by two significant debates within the international development community: 1) the role of the *private sector* in defining the goals, values, and methods of *development* (as a strategy to eradicate poverty); and 2) *privatization* of knowledge and land through (*intellectual*) *property rights* versus *indigenous knowledge*² and *the*

¹These contradictions are described in a number of critical works of Capitalism. One notable text is *The Origin of Capitalism*, by Ellen Meiksins Wood. In this book, which will be described in more detail in the following chapter, Wood challenges the commonly held notion that the mechanisms of Capitalism are part of human nature. The terms alone propose contradictory ideas, but often go unnoticed. For example, the term “market forces” is a commonly used phrase in modern Capitalist vocabulary, but the two words oppose each other in meaning. The word “market” connotes a sense of opportunity or choice, while the word “forces” connotes a sense of coercion. She writes, “what may not always be so clear...is that the distinctive and dominant characteristic of the capitalist market is not opportunity or choice but, on the contrary, compulsion” (Wood, p. 6). Ultimately, Capitalism inherently contradicts itself because it presupposes itself. Moreover, the “naturalization of capitalism,” in many ways exonerates it from accountability for the ecological, social, and political problems it creates. In *Spectres of Capitalism* (1998), Samir Amin warns, “History has proven that capitalism, like all social systems, is able at each stage of its expansion to overcome its own permanent contradictions, but not without worsening the violence with which they will be experienced by succeeding generations” (p. 11).

²*Indigenous knowledge* is a useful term to describe what Vandana Shiva refers to as “ways of knowing” (*Biopiracy*, p. 8), especially when it comes to science. She writes, “Indigenous knowledge systems are by and large ecological, while the dominant model of scientific knowledge, characterized by reductionism and fragmentation, is not equipped to take the complexity of interrelationships in nature fully into account. This inadequacy becomes most significant in the domain of life sciences, which deal with living organisms” (*Biopiracy*, p. 8). The term is particularly useful in assisting the effort to create an alternative paradigm of thinking about solutions for ecological, social, and political problems on the African continent. According to C. Tsehloane Keto, the contemporary “European-centered intellectual hegemony” (*Vision and Time*, p. 34) affects the identity of all people in society, especially those who do not have cultural origins in Europe. It is therefore necessary to create a framework for shifting the paradigm towards African-centeredness, if African people are to build a future that relies on its own complex past and not on the past of Europe or other external forces.

commons.³

Although the discourse of development has undergone many transitions since the 1950s—from modernization theory to human development to sustainable development—the capitalist impetus to achieve *growth* and *progress* remains a fundamental theme. Currently, there is a push from development institutions and their affiliates in the private sector for poor countries to increase wealth through agriculture, using innovations such as genetically modified seeds and other ‘improved’ seeds to increase crop yields. They substantiate their advice with laboratory results that indicate high survival rates of these crops despite exposure to various pests, weeds, chemicals and other factors that could contribute to low crop yield. Although the idea of having high-yield crops is appealing to most farmers, there are economic and ecological risks that are often understated in the marketing campaigns. In addition, the sale and use of privately produced and distributed ‘improved’ seeds destabilize the role and expertise of traditional farmers, who have for centuries developed their own methods for agricultural production consistent with the dynamic climate and conditions of their communities.

The problems associated with the use of these bio-engineered products demonstrate the incompatibility of neo-liberal market tendencies⁴ with the interests and culture of farmers in rural communities. While farmers throughout the world have always understood the importance of biodiversity, the effects of colonial agricultural practices have resulted in a strong presence of monoculture. For example, while the

³The *commons* refers to the widespread practice of knowledge-sharing and resource-sharing in communities, such as among farmers and in universities (Shiva, *Biodiversity*, p. 10). This practice has been threatened by multinational efforts like the Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS) and other legal arrangements that enforce ownership of things like ideas, music, art, seeds, and even women’s bodies.

⁴Neo-liberal economic tendencies are characterized by minimal involvement of the government in the market as its involvement is perceived as an obstacle for the market to reach its full potential. According to economist John Williamson, there are three institutions that mainly promote and, to some degree, enforce this thinking. Those are the IMF, World Bank, and the US Treasury Department – otherwise known as the “Washington Consensus.”

peanut or groundnut was not an indigenous plant to West Africa and may not have been an optimal choice for long-term cultivation in the region based on the soil composition and other factors, it was imposed as a major cash crop in the region to accommodate the desires of the European consumer. The groundnut gradually pushed other types of plants to the periphery of the domestic agricultural agenda in Senegal, specially, resulting in monoculture in many regions of the country. Although these monocultures are economically “efficient” in the immediate context of capitalist expansion, they are detrimental to the environment. Under obligations related to debt service, African nations continue to integrate their national economies into the global economy, at the risk of threatening the livelihood of peasant farmers, not only economically, but also culturally.⁵

In Senegal, farmers face the dim agricultural prospects of the land by turning to international financial institutions for loans, grants, and technical support as they continue to produce various cash crops (such as peanuts, cotton, rice, and maize) that are intended to increase their wealth and meet debt services. Genetically modified seeds and commercial hybrids have been proposed as an effective method for increasing crops yields and relieving poverty among rural farmers. However, there is overwhelming evidence that the use of these biotechnologies benefits the corporations that produce them more than the farmers that use them. For example, in India over one hundred farmers committed suicide when they were not able to pay back loans used to purchase pesticides for hybrid cotton crops.⁶

⁵“Let Nature’s Harvest Continue!: Response from All the African Delegates (except South Africa)” (paper presented at the FAO Negotiations on the International undertaking for Plant Genetic Resources, June 1998).

⁶See Vandana Shiva, *Betting on Biodiversity: Why Genetic Engineering Will not Feed the Hungry or Save the Planet* (New Delhi, India: Research Foundation for Science, Technology and Ecology, 1999); Vandana Shiva, *Stolen Harvest: The Hijacking of the Global Food Supply* (Cambridge MA: South End Press, 2000); Vandana Shiva et al., *Seeds of Suicide: The Ecological And Human Costs of Globalisation of Agriculture* (New Delhi, India: Research Foundation for Science Technology and Ecology, 2000).

Fortunately, farmers in Senegal have not yet experienced this level of desperation. However, contemporary development strategies in Senegal such as the Poverty Reduction Strategy Paper (PRSP) indicate a shift towards using advanced biotechnology that could potentially cause similar economic and ecological trends for rural farmers. The purpose of this study is to investigate the ecological and political impetus behind these efforts and to locate the challenges in the context of the local culture and ecology of Senegal. Ultimately, the challenges signify the continued location of Senegal and other developing countries within the periphery of the global capitalist system.

Background of Senegal

Senegal is located in West Africa, along the Atlantic coast. Within its borders lies the Gambia, a former British colony, which surrounds the Gambia River. To the north is Mauritania, which shares the use of the Senegal River. On the eastern border is Mali, and to the south are Guinea Conakry and Guinea Bissau. As part of the Sahel region, Senegal faces many environmental challenges such as desertification and salinization of the soil. The tropical climate is hot and humid most of the year, both during the rainy season of May through November and in the dry season of December through April.

Only 2% (4,190 sq km) of Senegal's total area (196,190 sq km) is water. Although most of the terrain is low plains, the southeastern region elevates to foothills. It is estimated that 12.51% (24,543.4 sq km) of the land is used to cultivate annual crops like wheat, maize, and rice. Only 0.24% (470.9 sq km) of the land is used for permanent crops like flowering shrubs, fruit trees, nut trees, and vines. The remaining 87.25% of the land accounts for urban areas, roads, pastures, and land not used for

agriculture, and 0.61% (1200 sq km) of the land is irrigated.⁷

Of its 12,521,851 inhabitants (estimated in July 2007), 94% are Muslim, 5% are Christian, and 1% practice indigenous religion. In terms of ethnic distribution of the population, 43.3% are Wolof, 23.8% Pulaar, 14.7% Serer, 3.7% Diola, 3% Mandinka, 1.1% Soninke, 1% European and Lebanese, and 9.4% are identified as “other”.⁸ Although French is the official language, most people speak Wolof. Pulaar, Diola, and Mandinka are also spoken, although not as widely as Wolof.

Senegal is ranked among the poorest countries in the world, with a per capita GDP (PPP) of \$1,800 (estimated in 2006). To put this number in perspective, the per capita GDP (PPP) of the United States is \$43,800. At 54%, more than half of the population lives below the poverty line, and 77% of the population is occupied in the agricultural sector. The national literacy rate for people over the age of 15 is 39.3%. While 51.1% of men are literate, only 29.2% of women are literate.⁹

Table 1. Selected indicators for Senegal, United States, and France¹⁰

	Senegal	United States	France
GDP per capita (PPP)	\$1,800	\$43,800	\$31,200
Percent of population below poverty line	54%	12%	6.2%
Literacy rate	39.3%	99%	99%
Unemployment rate	48%	4.8%	8.7%
Distribution of family income – Gini index ¹¹	41.3	45	26.7

⁷*CIA World Fact Book* [https://www.cia.gov/library/publications/the-world-factbook/] (Central Intelligence Agency, 4 October 2007 [cited 18 October 2007]).

⁸*CIA World Fact Book*

⁹*CIA World Fact Book*. It should be noted, however, that literacy in this case is defined as having the ability to read and write. Wolof and other indigenous languages of Senegal are not traditionally written languages. While there has been significant effort and progress in codifying a uniform written culture for the Wolof language and other indigenous languages, literacy, in the statistical sense, in Senegal is contingent on the person’s ability to understand French. Most people in the rural areas do not even speak French, much less read or write it. These facts call into question the meaning of *literacy* as an indicator of social development.

¹⁰*CIA World Fact Book* [cited 21 January 2008].

¹¹The Gini coefficient (expressed as a percentage in the Gini index) measures inequality in income distribution. A Gini coefficient of 0 indicates perfect equality in which everyone in the population has the exact same income. A Gini coefficient of 1 indicates perfect inequality in which one person has all

Until 1960, Senegal was a colony of France, and played an important role as the center of colonial government for all of French West Africa. Residents of Thies, Dakar, Rufisque, and Saint Louis were considered citizens of France, and many of Senegal's early independent leadership like Léopold Sédar Senghor and Blaise Diagne were educated in France. While socialist ideas served the newly independent nation's goals to create a sense of nationalism, in 2000 there was a major shift in political trend as the Senegalese Democratic Party (PDS) took control with the election of President Abdoulaye Wade. Since his election, the Senegalese government has developed a new constitution that decentralized power throughout the 10 existing regions of Senegal – Dakar, Diourbel, Fatick, Kaolack, Kolda, Louga, Saint Louis, Tambacounda, Thies, and Casamance – and created one new region, Matam, near Saint Louis. Elections for the president and for representatives to the National Assembly occur every five years according to the new constitution, and during these elections, candidates from the over twelve political parties actively engage in debates and campaigns.

Since the rise of the PDS, Senegal has taken on more neo-liberal economic and political strategies to deal with the problems of poverty and debt. Senegal was among the 42 countries identified as Heavily Indebted Poor Countries (HIPC) by the International Monetary Fund (IMF) in 1996, qualifying the nation for debt rescheduling and forgiveness. In 2005, the IMF approved a proposal for 100% debt relief to Senegal, which took effect in mid-2006,¹² causing Senegal's external debt to decrease dramatically from almost \$4 billion in 2005 to \$1.628 billion in 2006.¹³ In addition, Senegal has spearheaded major projects for African development, especially

the income and everyone else has no income.

¹²Andrew Balls. "IMF approves debt relief for poorest countries," *Financial Times* (December 21, 2005), <http://www.ft.com/> (accessed 21 January 2008).

¹³*CIA World Fact Book* [cited 21 January 2008]; *EarthTrends* [Online database]. World Resources Institute, 2007.

through the New Partnership for Africa's Development (NEPAD).

NEPAD is a collaborative effort of African nations to develop a strategy for reducing poverty and debt service in Africa through neo-liberal economic policies. In its plan for agricultural development, NEPAD proposes advancements in the use of biotechnology such as GM seeds. Although the use of biotechnology like GM seeds may appeal to the goals of NEPAD and structural adjustment programs, use of these products may have seriously dangerous consequences for public health, economic security, and ecological sustainability in Senegal. The use of GM seeds should be researched now, while potential harm can still be avoided and while there are still options for alternatives. These alternatives may lie in a deeper understanding of indigenous knowledge. Locating the vestiges of local, non-capitalist economies in Senegal may lead to an effective model for solving contemporary social problems like hunger and environmental degradation. Investigating development policies and practices through an Africa-centered¹⁴ lens, I will illustrate the ways in which the history and underlying assumptions and values of *development* are counterproductive when it comes to improving the quality of life in Africa.

Methodologies

After reading the works of ecologist and activist Vandana Shiva's, in which she revealed the hardship of Indian farmers in the face of corporate patents on seed technology, I began to investigate similar issues of intellectual property, agriculture,

¹⁴See C. Tsehloane Keto, *Vision and Time: Historical Perspectives of an Africa-Centered Paradigm* (Lanham MD: University Press of America, 2001). Here, he provides a theoretical framework for Africa-centered thinking, which "revolves around the simple argument that the African historical experience can rightfully provide a focus for scholarship that explains developments around the world through the prism of African eyes and experience" (Keto, p. 53). The ultimate goal is not to replace European intellectual hegemony, but rather to contribute to a "multicentered" perspective. This notion resonates with Samir Amin's idea of a polycentric world, which will also be discussed in subsequent chapters. See also, Samir Amin, *Delinking: Towards a Polycentric World*, (New Jersey: Zed Books, 1990).

and development in Senegal. Shiva began her work in indigenous community-based seed production and distribution after over one hundred Indian farmers committed suicide because of debt. As advised by the government and several non-governmental agencies, these farmers took out loans to purchase genetically modified seeds, which allegedly would increase crop yields and subsequently wealth. Unfortunately, the crops failed miserably, and the farmers were unable to pay their debts.¹⁵

In June and July of 2003, I conducted research in Senegal on the use of genetically modified seeds in agriculture. I began by establishing contacts with the West African Research Center and with non-governmental organizations with which I had previously worked, including Africare-Senegal. I established a network of researchers, scholars, and development professionals and proceeded to conduct interviews with them, discussing issues of development policy, ecological challenges in Senegal, and the role genetically modified seeds may play in the future of Senegalese agriculture. With the help of my colleagues, I was able to spend several days at the Bambeye Research Center of the Senegalese Institute for Agricultural Research (ISRA), where I accessed several reports of studies about seed production and distribution from the 1970s to the present day. I also spent several days at the Bureau of Statistics in Dakar, where I found documentation of agricultural production by region within Senegal.

Because of time constraints and shortage of resources, I was not able to conduct interviews with farmers in Senegal. Although these interviews would have enhanced the understanding of the real implications of development policy and the debates on biotechnology on the farmer, my study focuses mainly on the policy implications and some broader aspects of the acculturation process associated with

¹⁵See Vandana Shiva et al., *Seeds of Suicide: The Ecological And Human Costs of Globalisation of Agriculture* (New Delhi, India: Research Foundation for Science Technology and Ecology, 2000).

development ideology. This study will serve as a foundation for more extensive research on grassroots opportunities for achieving development goals.

Organization of the Thesis

In chapter 2, I review key literature on the fundamental topics addressed in this thesis—namely development and genetically modified seeds—which provide a theoretical framework for the discussion of agricultural prospects in Senegal. Within the language and behaviors surrounding the debate on the use of genetically modified seeds in Senegal are embedded cultural, economic, and ecological contradictions. The ideas behind biotechnology research and development objectives indicate specific cultural and social values that clash with indigenous knowledge and values.

In Chapter 3, I discuss these contradictions, focusing primarily on the role of nature within Wolof culture.¹⁶ Western ideas of development are challenged by the cultural resistance to Western ideologies of nature, including those that impose a gendered perception of nature and the notion of private property and ownership. Ultimately, the manufacturing, patenting, and sale of seeds indicate a new phase of colonization that threatens the livelihood of peasant farmers not only in Senegal, but all over the world.

Chapter 4 deals with the ecological history of Senegal and how this history accounts for the nation's current ecological state. The legacy of colonial agriculture is still quite visible in contemporary agricultural production. Because of its tendency towards monoculture, colonial agriculture destroyed much of the region's indigenous biodiversity and accounts for the poor quality of the soil today. Despite the serious

¹⁶While there are several other ethnic groups represented in Senegal, my language skills are limited to Wolof and therefore, I chose to focus on this culture as opposed to the many others. The Wolof account for 43%, of the population, and the language is spoken by most people in the country even if they are not Wolof. Further study would be required to ascertain differences in the role of nature between the different ethnic groups.

decline in agricultural production, the Senegalese government is putting much of the burden to increase national per capita wealth on the agricultural sector. Increased use of biotechnology, such as genetically modified seeds and commercial hybrids, is an attractive solution for meeting these expectations.

In chapter 5, I explore some of the proposed remedies to deal with Senegal's declining economy and ecology. As a response to the failure of the SAPs of the 1980s and the economic contraction of the 1990s, the Senegalese government has decided to comply with IMF pressure to implement the recommendations of the required Poverty Reduction Strategy Paper. This initiative relies heavily on increased agricultural production, which is contingent on the use of "improved" seed varieties, which have both economic and ecological consequences. Alternatively, there have been some developments in the services sector, which could be a viable solution to poverty reduction. However, without a holistic national approach to harnessing the impact of this growth, it could also create even greater disparity between the urban and rural economies. Samir Amin's idea of *delinking* provides a potential framework for developing a national strategy to gradually remove Senegal from the global periphery.

CHAPTER 2

REVIEW OF LITERATURE: POLITICAL ECONOMY, BIOTECHNOLOGY, AND AFRICAN DEVELOPMENT

Thirty-two of the thirty-eight HIPC identified by the IMF are in sub-Saharan Africa. The last twenty-three countries (of one-hundred seventy-seven countries) listed on the UNDP's Human Development Index (HDI) are located in sub-Saharan Africa.¹⁷ These statistics are a stark contrast to the vast natural resources that exist on the continent. So how is it that so many African people suffer from poverty? When did African people become poor? Who or what made them poor?

While there are many efforts among government and non-government organizations to improve development on the continent, there is a tendency among development professionals—the practitioners of development, progress, and forward motion—to forget to look *back* at history to see *how poverty happened*. This linear and binary notion of human nature, moving backwards or forwards, being traditional or modern, resonates in development practice and theory, and is rooted in the evolution of European consciousness since the rise of capitalism in fifteenth century England and its systemically inherent expansion. However, the philanthropic language of development often disguises its underlying mission to open markets and increase access to resources for the small fraction of the world's population who value material accumulation and wealth, much in the same way the idea of *mission civilatrice* justified colonial expansion in the eighteenth and nineteenth centuries. In order to discuss the meaning of biotechnology in Senegal, we must first understand the

¹⁷*Human Development Report 2006* [<http://hdr.undp.org/hdr2006/statistics/>] UNDP (Accessed 18 October 2007).

principles and history of capitalism, development, and biotechnology.

Capitalism and Development in Africa

To discuss the contemporary economic situation of African people, we must ask two questions: Does Capitalism exist in Africa? Or is Africa an appendage of a larger Capitalist system? Once we understand the origin of Capitalism and its relationship to the African continent, we need to consider the meaning of *development* within the historical context of colonialism and exploitation.

In *The Origin of Capitalism*, Ellen Meiksins Wood explains that concept of *private property* was the catalyst for the birth of capitalism in Europe.¹⁸ The nature of rural European land use and concepts associated with it made a very significant transition in response to the rise of social values of accumulation and wealth in the fifteenth century. In sixteenth century England, “Landlords and tenants alike became preoccupied with what they called ‘improvement,’ the enhancement of the land’s productivity for profit.”¹⁹ *Improvement* entailed developing more efficient farming methods including crop rotation, fallowing, and the use of more advanced technology in order to increase output for sale.

By the sixteenth century, under capitalism’s imperative to maximize profits, European landlords had to redefine the idea of property. Although it was clear that landlords possessed land and tenants did not, tenants did have certain customary rights to use the land as needed, thus claiming a type of ownership or command of specific plots of land. The birth of capitalism, according to Woods, was with *enclosure*. In Europe, enclosure was characterized by government endorsed and enforced restrictions on property ownership and usage. Instead of allowing tenants to use

¹⁸Ellen Meiksins Wood, *The Origin of Capitalism* (New York: Monthly Review Press, 1999).

¹⁹Wood, p. 80

common land for subsistence agriculture, it was enclosed to graze sheep or grow commercial crops. Agricultural production became commoditized, and was no longer for use, but for sale. *Thus what was formerly a social custom and cultural ideology became a politicized material indication of power and status as well as a means for expanding capital.*

Karl Marx provides an explanation for this transition with two distinct circuits of exchange. In a *simple commodity circuit*, commodities are exchanged at self-extinguishing value (C-M-C). But in a *capitalist circuit*, money is invested into a commodity in order to sell the commodity for profit. In this case, capital has a self-expanding value (M-C-M'). To achieve its goal of self-expanding value, Capitalism operates on three specific laws of motion: competition, profit maximization, and capital accumulation.²⁰

Capitalist culture crystallized in the Renaissance and the Enlightenment through two expressions: economic and political. The economic expression, mercantilism, and the political expression, absolute monarchy (as opposed to the prior feudal structure), created a social contract through the new governments of the Americas and post-revolution France.²¹ Eighteenth century Enlightenment thinkers enforced the transitioning concept of private property so that it became an ideology and standard model for European economic expansion into other parts of the world. Within this new way of thinking, opportunities for exchange were a liberating force, and expanding free markets was the most effective way of liberating the human being. Thus, Europeans justified their expansionist policies as a realization of their evolutionary human potential. John Maynard Keynes suggests that laissez-faire policies, in which the government limited its restrictions on trade, serve society the

²⁰Wood

²¹Samir Amin, *Spectres of Capitalism: A Critique of Current Intellectual Fashions*, trans. Shane Henry Mage (New York: Monthly Review Press, 1998).

best by both allowing full access to markets and consequently creating a more free society.²² *Progress* is only truly possible when people can participate in markets without restrictions from social orders or government. These neoliberal principles justified the European colonial project, and continue to inform contemporary development policies, which will be discussed below.

Wood identifies a very strong fallacy in the capitalist model—it begs the question by assuming capitalism and all of its components as natural. Thus, the model excludes the imperatives of capitalism from its explanation. It does not explain the nature of efficiency and its specific laws of motion: competition, profit maximization, and capital accumulation. These concepts are essential to the development of capitalism and have existed only for a short period of time. In fact, Woods states,

In order to explain capitalism's distinctive drive to maximize profits, they have presupposed the existence of a universal profit-maximizing rationality. In order to explain capitalism's drive to improve labor productivity by technical means, they must have presupposed a continuous, almost natural, progress of technological improvement in the productivity of labor.²³

While the innovations of the Industrial Revolution enforced the notion that Europeans were achieving a higher level of human evolution, the imperial and colonial imperatives of increasing European wealth would have detrimental effects on the people and land of the Americas, Africa, and Asia. Samir Amin reiterates Woods critique in the context of global economic inequality:

The inequality that it [capitalism] promotes undermines its possibilities for expansion. It expands consumption in a distorted manner by favoring wholesale waste by the rich, but this in no ways compensates

²²John Maynard Keynes, *The Collected Writings of John Maynard Keynes* (New York: St. Martin's Press, 1971).

²³Wood, 3

for the poverty to which it condemns the majority of workers and peoples, who become ever less successfully integrated into the system of exploitation. So capitalism, by its very logic, reduces them to a marginal status and settles for mere crisis management, which it can do as long as the social power of its adversaries is not reconstituted.²⁴

In essence, the so-called ‘pure economics’ of Capitalism maintain that “markets are self-regulating in a way that produces a natural, general equilibrium which is the best possible for the society.”²⁵ The general equilibrium theory derives human satisfaction from market interaction, regardless of the environmental implications of the production method of goods.

In addition to the assumption of general equilibrium, Capitalism also assumes the principles of *comparative advantage*, in which specialization and trade benefit everyone,²⁶ and *allocative efficiency*, in which resources always flow to their best use. Finally, Keynesian economics contributes the notion that *growth* is the universal answer to achieving development and alleviating poverty. But beyond the economic theory, according to Amin, Capitalism has come to embody a culture. Requiring the cultural acceptance of individual freedom, “the autonomous character of human reason,” and an unbreakable connection between reason and liberation, Capitalism explains itself as the only way of achieving full ‘humanness.’²⁷ In other words, Capitalism exists not only as an economic system, but also as a social system.

Marx analyzed the contradictions of the Capitalist system by defining its historical limits. He begins his critique by questioning the exchange value of commodities. If commodities exchange at their value (M), how can $M' > M$? In other words, where does the change in M come from? Through an examination of Capitalist

²⁴Amin, *Spectres of Capitalism*, 8

²⁵Amin, *Spectres of Capitalism*, 9

²⁶See David Ricardo, *The Principles of Political Economy and Taxation* [1817] (London: J.M. Dent & Sons, 1978).

²⁷Amin, *Spectres of Capitalism*, p. 58.

production, Marx concludes that value is *created* in the process of production and *realized* in the process of exchange. Value is created through exploitation of labor, and the owners of the means of production (Capitalists) reap profits. To balance the socio-economic disparity of the Capitalist system, Marx proposes social movements spearheaded by the proletariat, or the working class, in which they would take over the means of production.²⁸

While Marx's analysis of the laws of value is relevant to the experience of Africans in global capitalism, Saul and Leys do not believe that Marx provides a suitable explanation of exploitation in Africa and of Africans. They contend that "...in the Marxian sense of the term Africa has 'suffered' not from being exploited, but from not being exploited enough; not enough capital has been invested; too few Africans have ever been employed productively enough to create relative surplus value; the reinvested surplus has been too small."²⁹ That is to say, a Marxist approach to "developing" Africa would result in the same ecological and economic consequences, because it adheres to the same principles of growth and ownership.

Just after the inaugural decade of African independence, Walter Rodney would attempt a thorough Marxist explanation of Africa's post-colonial economic distress in *How Europe Underdeveloped Africa*. Having defined *development* as a natural process whereby people and societies use their creative and technological abilities to adapt to external circumstances including the environment and social and political interactions, Rodney defines *underdevelopment* not as an "absence of development," but "as a means of comparing levels of development."³⁰ What complicates this notion

²⁸See Karl Marx, *Capital: A Critique of Political Economy*, trans. Ben Fowkes, 3 vols., vol. 1 (New York: Penguin Books, 1990).

²⁹John S. Saul and Colin Leys, "Sub-Saharan Africa in Global Capitalism," *Monthly Review* 51, no. 3 (1999).

³⁰Walter Rodney, *How Europe Underdeveloped Africa* (Washington D.C.: Howard University Press, 1972), 13.

of development is the question of why different people develop at different rates.

Capitalist expansion and its associated development strategies, among all forms of economic development, proved to have the most widespread negative effects on the peoples of the world, including European peasants and workers and all people of Africa, Asia, and Latin America. Rodney writes, “Capitalism has created its own irrationalities such as vicious white racism, the tremendous waste associated with advertising, and the irrationality of incredible poverty in the midst of wealth and wastage even inside the biggest capitalist economies.”³¹ From the 15th to the 19th centuries, Europeans extracted much of Africa’s wealth through colonialism, settlement, and enslavement. In addition to the material effects of exploitation, the shift from trans-continental to coastal trading also created economic stagnation through the African continent, eliminating the impetus for technological advancement and the pre-existing economic development. Even after political independence, Western nations continued to exploit African nations by controlling the price of agricultural goods and by maintaining ownership of the means of production in Africa (including land, mines, banks, factories, and insurance companies). Rodney’s analysis suggests that Africa’s own natural course of *progress* was thwarted when it was grafted into Europe’s Capitalist project. For this reason, post-colonial³² Africa faces a dual problem of uneven development and a lack of infrastructure and resources to ‘catch up.’ Rodney’s work is important for understanding the degree to which the parasitic nature of European colonialism affected the contemporary economy of Africa.

³¹Rodney. 10

³²“Post-colonial” is a loaded term, but in this case, I simply mean “after [nominal] independence.” The irony of the term is that the relationships forged during the colonial period changed very little after independence. Moreover, the economic and infrastructural conditions, in many cases, worsened with the transition. It seems that the entire project of modern development is to bandage, but not heal, these wounds, maintaining the same distribution of social, economic, and political power in the world.

According to Gilbert Rist, it was President Truman's "Point Four" that heralded the 'development era' by introducing a "new world-view" of 'underdevelopment.'³³ He thoroughly explains the "*terminological innovation*" of the development discourse:

The appearance of the term 'underdevelopment' evoked not only the idea of change in the direction of a final state, but above all, the possibility of bringing about such change. No longer was it just a question of things 'developing'; now it was possible to 'develop' a region. Thus '*development*' took on a transitive meaning (an action performed by one agent upon another) which corresponded to a principle of social organization, while 'underdevelopment' became a 'naturally' occurring (that is, seemingly causeless) state of things...³⁴

'Underdevelopment' was not the opposite of 'development', only its incomplete or (to stay with biological metaphors) its 'embryonic' form; an acceleration of growth was thus the only logical way of bridging the gap...[Each nation's] 'development' was very largely an internal, self-generated, self-dynamizing phenomenon, even if it could be 'assisted' from outside. *Once more, the naturalization of history empties history of its content.* The historical conditions that would explain the 'lead' of some countries over others cannot enter into the argument, since the 'laws of development' are supposedly the same for all.³⁵

Development would become the process by which humans achieved their full evolutionary potential—the vehicle of Capitalism's three laws of motion identified by Wood: competition, profit maximization, and capital accumulation. What characterizes the 'development era' specifically is the way this term and process is operationalized not only economically, but also politically and socially.

On the meaning of development, Peet and Hartwick write, "In its strong sense, development means using the productive resources of society to improve the living

³³Gilbert Rist, *The History of Development from Western Origins to Global Faith*, trans. Patrick Camiller, New edition, revised and expanded ed. (London and New York: Zed Books, Ltd. 2002), 72 [emphasis mine].

³⁴Rist, 72-3

³⁵Rist, 74

conditions of the poorest people. In its weaker sense, development means more of everything for everyone in the context of a lot more for a few.”³⁶ Differentiating development from economic growth, they contend that development deals with the *conditions* of production, and not production alone. On a more philosophical level, Wallerstein dubs development “a Promethean myth.”³⁷ He characterizes it as “the realization of our libidinal desires. It is pleasure and power combined, or rather fused. The desire lies within us all. What the capitalist world-economy as a historical system has done is to make these desires for the first time socially legitimate.”³⁸ *Development* has manifested itself in many forms both in discourse and in practice, but its general assumptions remain the same: humans possess an innate desire for growth and accumulation, and by accommodating this desire humans evolve to their highest potential. In fact, most theories of *development* assume its Capitalist-informed values and focus mainly on how to stimulate *growth* in ‘stagnant’ or ‘backwards’ economies.

Walt Whitman Rostow elaborated this idea through his theory of economic take-off for *development*.³⁹ Nation-states could facilitate *progress* by promoting industrialization and allowing the market to function without restrictions. These notions of uninhibited markets facilitated by the state were the foundation of *modernization theory*, a type of development strategy adopted by development institutions⁴⁰ in the 1950s and 1960s. These strategies entailed heavy industrialization

³⁶Richard Peet and Elain Hartwick, *Theories of Development* (New York: The Guilford Press, 1999).

³⁷Immanuel Wallerstein, *Unthinking Social Science: The Limited Possibilities of Transformation within the Capitalist World-Economy* (Cambridge UK: Polity Press, 1991).

³⁸Wallerstein, 107

³⁹Walt Whitman Rostow, “The Economies of Take-Off into Sustained Growth” (paper presented at the proceedings of a conference held by the International Economic Association, New York, 1963).

⁴⁰The term ‘*development institutions*’ refers mainly to the United Nations, the Bretton Woods institutions, and in the more contemporary context, governmental and non-governmental agencies such as the United States Agency for International Development (USAID) and WinRock International. Of these institutions, the ones created at Bretton Woods in 1944 have the most power in defining the goals and strategies of development. They include: the International Bank for Development and Reconstruction (IBDR or commonly known as the World Bank), the International Monetary Fund (IMF), and the General Agreement on Tariffs and Trade (GATT, now known as the World Trade Organization or the WTO). The IBDR was originally intended to finance the reconstruction of post-war

of agriculture and manufacturing sectors, and insisted on private ownership and liberal markets. By fulfilling these prerequisites, nation-states would experience economic take-off and achieve a more sophisticated economy and a higher per capita GDP.

By the 1970s, however, there was clear evidence that this strategy did not work. The environmental consequences, viewed as an external factor in all the models of modernization theory, were far more serious than any of the practitioners had imagined. The Green Revolution was the subsequent development strategy that aimed to maintain the status quo of production functions while engendering some kind of environmental consciousness. The idea of *sustainable development* arose out of development situations where natural resources were significantly destroyed and therefore no longer conducive to development. It entailed the idea that development would occur in order to provide for the present population while simultaneously ensuring a productive environment for future generations.⁴¹ Seed technology would provide a false sense of sustainable security within the Capitalist logic by producing an immediate increase in crop yields and a non-chemical or reduced-chemical approach to cultivation. However, the economic demands on poor countries to produce *more* agricultural goods actually increased—an undeniable contradiction of environmentalist discourse.

From the 1960s to the end of the 1970s, the public sector was responsible for

Europe through loans. However, the U.S. Marshall Plan undermined this initiative with its rapid financial service and concrete plan for re-industrialization of Europe and Japan. In response, the World Bank initiated a global marketing strategy, offering loans to increase industrial capacity and foreign investment. The IMF was originally established in order to stabilize currency prices, but eventually changed its role to stabilizing policies. It served as the liquidation agent for the global economy. If a country could not pay back its debt to the World Bank, the IMF would offer another loan to help meet payments, contingent on the country's willingness to liberalize its economy through Structural Adjustment Programs (SAPs). The GATT (changed to the WTO in 1995) provided protection to the corporate interests of *development* by politically eliminating trade barriers. For a more thorough explanation of the history and purpose of the Bretton Woods Institutions, see David C. Korten, *When Corporations Rule the World* (San Francisco: Berrett-Koehler Publishers, 1996).

⁴¹W, M. Adams, *Green Development: Environment and Sustainability in the Third World* (London and New York: Rutledge, 1990).

the dramatic increase of agricultural production in developing countries. Researchers in the United States and Europe had developed high response seeds, and the World Bank supported the development of public sector supply for farmers. In the 1960s, approximately 80% of seeds used by farmers were still their own varieties.⁴² However, since the 1980s, most agro-industry growth relies on private sector investment, research, and implementation. *It is during this so-called “Green Revolution” that seeds became correlated with debt.*⁴³ The Green Revolution involved a shift of power over agriculture from independent farmers to agro-chemical and seed corporations and international research centers. Seeds became an *input* into a neo-liberal economic equation rather than the free resource they were before. Moreover, seeds became a source of profit in and of themselves, since private corporations could now sell so-called ‘improved’ varieties. Collaborating with the burgeoning *development industrial complex*, private corporations sold enormous quantities of seeds to farmers all over the world, who were only able to afford these seeds by borrowing money from financial institutions.

Considering its demands on rural farmers in poor countries to intensify crop production through so-called ‘improved’ technology, it is difficult to see what was so ‘green’ about the “Green Revolution,” except perhaps the revenue it created for Western agricultural technology corporations. Despite its claim to accommodate the values and interests of the farmers by providing “sustainable” alternatives to industrial agriculture, the Green Revolution failed to locate and challenge the oppression associated with the Capitalist world economy. In fact, it served to disguise the fundamental unsustainability of Capitalism, by appropriating the vocabulary of environmentalism, while maintaining its basic laws of motion. The policies created to

⁴²Vandana Shiva et al., *Seeds of Suicide*.

⁴³Shiva, *Seeds of Suicide*.

“protect” the environment were more an effort to create a sustainable world for business than to create a sustainable world for people. As Devlin Kuyek succinctly explains, in his report on the use of biotechnology in African agriculture, “The Green Revolution technologies were not developed for local conditions: rather, local conditions were expected to adapt to the technologies.”⁴⁴

While economists and politicians of the North attempted “damage control” on the image of the burgeoning *development industrial complex*, those of the South were formulating an explanation of and possible solution to the inequitable distribution of wealth and power in the world. In 1966, Paul Baran and Paul Sweezy published the landmark *Monopoly Capital: an Essay on the American Economic and Social Order*, in which they deconstruct the American experience of Capitalism in an effort to forewarn other nations attempting to reach the same level of economic development. Adjusting Marx’s principles to fit the contemporary state of the Capitalist system, Baran and Sweezy demonstrated that “*surplus that is not absorbed is also surplus that is not produced: it is merely potential surplus, and it leaves its statistical trace not in the figures of profits and investment but rather in the figures of unemployment and unutilized productive capacity.*”⁴⁵ When surplus is not absorbed, the dominant economic system experiences crisis, which can be remedied in two ways: 1) epoch-making innovations and 2) war and its aftermath. Within the context of this study, seed technology constitutes an “epoch-making innovation” intended to increase agricultural production and to reverse the stagnant economies of poor countries.

Adapting this and other propositions in *Monopoly Capital*, economists in South America, Asia, and Africa applied this *tendency of surplus to rise* to the role of

⁴⁴Devlin Kuyek, “Genetically Modified Crops in Africa: Implications for Small Farmers,” (Barcelona: Genetic Resources Action International, 2002).

⁴⁵Paul A. Baran and Paul M. Sweezy, *Monopoly Capital: An Essay on the American Economic and Social Order* (Monthly Review Press, 1966).

poor countries in the global economic system. Baran and Sweezy, followed by Raúl Prebisch, André Gunder Frank, Samir Amin, and many others, would inaugurate the *dependency school of thought*. There is no codified formula or spokesperson for *dependency*, but its general motivation is to explain the reasons for the poverty of nations in the South and the way in which the international system has locked poor countries into a dependent relationship with rich countries. For their relevance to the case of Africa and to the language of development that I have been discussing so far, I will briefly outline the contributions of André Gunder Frank and Samir Amin.

According to Gunder Frank, economic surplus flows from the periphery (former colonies) to the core (former colonizers). Instead of focusing on the *production* of economic surplus, Frank focused on exchange mechanisms. In this context, *underdevelopment* is the process whereby the economic surplus from the periphery flows into the center or metropole leaving the periphery without the capacity to invest in its own future growth. Thus, the periphery becomes dependent on the center for not only capital, but also culture. Consistent with Marx's analysis, the core ruling class is interested in increasing productivity through mechanization to benefit its own internal market. The periphery ruling class accommodates the interests of the core ruling class through imitative, and not real, cultural identification. Because this *lumpenbourgeoisie* locates itself culturally within the core culture, the economic surplus follows suit and becomes tied to the multi-national market, and not to the internal market. In other words, the periphery ruling class maintains export-oriented trade policies.⁴⁶

Samir Amin, a more contemporary *dependentista*, expands on the center-

⁴⁶See Andre Gunder Frank, *Dependent Accumulation and Underdevelopment*, New York: Monthly Review Press, 1979; Andre Gunder Frank, *Lumpenbourgeoisie, Lumpenddevelopment*, New York: Monthly Review Press, 1973; Andre Gunder Frank, *World Accumulation, 1492-1789*, New York: Monthly Review Press, 1979.

periphery analysis by using the nation-state as the unit of analysis and asserting a *tradition* of underdevelopment that is embedded in the core culture.⁴⁷ Claiming that former colonies were economically designed with unequal specialization, *dependency* is a direct refutation of *comparative advantage*. Unequal specialization leads to unequal development, in which exploitation does not only occur in the production process, but also in the *exchange* process. Unlike most economists, Amin believes that each aspect of exploitation, such as the characteristically low wages in poor countries, must be explained economically, historically, and culturally. These explanations can be achieved by investigating the interaction of the forces of production (technology) and the relations of production (social class). Amin identified two main contradictions in this interaction. First, the forces of production change more rapidly than the relations of production. Second, the appropriation of social production by the private sector undermines the equilibrium between social classes. Of the numerous theories that attempt to explain poverty and wealth, Amin's explanation of dependency provides the most holistic approach to understanding the relationship between Capitalism and Africa. Based on his analysis, clearly Capitalism does not significantly exist in Africa, but Africa does play an important role in global Capitalism. As Saul and Leys write,

after 80 years of colonial rule and almost four decades of independence, in most of it there is some capital but not a lot of capitalism. The predominant social relations are still not capitalist, nor is the prevailing logic of production. Africa south of the Sahara exists in a capitalist world, which marks and constrains the lives of its inhabitants at every turn, but is not of it.⁴⁸

⁴⁷Samir Amin, "Imperialism and Globalization," *Monthly Review* 53, no. 2 (June 2001).

⁴⁸Saul and Leys, "Sub-Saharan Africa in Global Capitalism."

Seeds: The New Colonial Frontier

In *Biopiracy: the Plunder of Knowledge and Nature*, ecologist and activist Vandana Shiva writes,

Capital now has to look for new colonies to invade and exploit for its further accumulations—the interior spaces of the bodies of women, plants, and animals...Biotechnology, as the handmaiden of capital in the postindustrial era, makes it possible to colonize and control that which is autonomous, free, and self-regenerative...Technological development under capitalist patriarchy proceeds steadily from what it has already transformed and used up, driven by its predatory appetite, toward that which has still not been consumed. It is in this sense that the seed and women's bodies as sites of regenerative power are, in the eyes of capitalist patriarchy, among the last colonies.⁴⁹

However, from the perspective of *capital*, seeds and women's bodies are new *frontiers* for which capital can serve as a “liberating force” to eliminate limitations to *growth* by opening access to markets. The notion that nature is an obstacle to growth and human evolution stems from the discourse of neo-liberal economics and European Enlightenment philosophy, discussed above.

In the late 1980s, Western scientists developed transgenic technology for agricultural crops, which was met with both enthusiasm and skepticism. Proponents of their use believed that the ability to control the traits of agricultural products could help protect the environment and aid in world development by reducing poverty and relieving hunger—the main principles of the Green Revolution. Kuyek describes the initial excitement about genetic engineering:

Proponents claim that by transferring genes from one organism to another, genetic engineering can overcome the productivity constraints of conventional plant breeding. It is claimed that the new transgenic

⁴⁹Vandana Shiva, *Biopiracy: The Plunder of Knowledge and Nature*. Boston MA: South End Press, 1997.

crops will reduce pesticide use and increase food security in developing countries—a promise that these countries desperately want to believe. It is also widely claimed that the ‘new’ global economy will be built on genetic engineering, and any country that stands on the sidelines will lose its future competitiveness.⁵⁰

However, critics were unconvinced that the technology was safe and effective for long-term use. Most countries, at the time of this technological innovation, were politically unprepared for legal and legislative action on biosafety, and even more economically unprepared for its introduction into the market.

There are several methods to genetically modify seeds. One method is gene-silencing, in which a specific trait of a plant is inhibited. For example, fruits that are exported may have a longer shelf life if the gene that controls the speed of ripening is silenced. The single-gene method entails adding one trait to a plant. This includes the addition of chemicals to enhance pest-resistance or a gene from another plant to enhance or subdue a specific trait (such as color, scent, flavor, etc). Complex-gene modification may be used to control a plant’s ability to adapt to abiotic stresses such as drought or salinity, as well as to reproduce or flower. Because of the intensive nature of this type of modification, it is less available on the market, but a common subject in trials.⁵¹

Most genetically modified seeds are used by farmers to produce non-food crops, such as cotton, or food crops that are not meant for direct human consumption, like corn for livestock feed. A common example is Monsanto’s Bollgard Cotton. *Bacillus thuringiensis* (*Bt*) is a naturally occurring organism that produces a toxin. This gene is applied to cottonseeds so that the cotton will produce its own

⁵⁰Kuyek, p. 1

⁵¹“Environmental Effects of Transgenic Plants: The Scope and Adequacy of Regulation,” (Washington, D.C.: National Research Council, 2002).

insecticide.⁵² American researchers credit *Bt* genes with providing protection against insect pests, increasing the health of root systems for better drought tolerance and fertilizer utilization, and increasing the rate of growth.⁵³ However Shiva and other critical researchers have found that *Bt* crops also affect beneficial insects like bees and lady bugs, which aid in pollination, as well as organisms in the soil that degrade organic matter. In fact, the pests that the *Bt* is supposed to target actually become resistant to the Bt toxin, creating “super-pests.”⁵⁴

Despite the unknown long-term effects of this particular biotechnology, researchers believe that genetically modified (GM) crops could address several social needs including hunger, agricultural productivity, nutrition, and the reduction of environmental pollution. From this perspective, GM crops are a viable solution for development objectives. Modifying any specific trait of a plant requires modifying the reproductive capability of any plant, in order to reduce risk of cross-pollination with wild plants. More importantly, sterility also causes plants to grow faster.⁵⁵

The National Research Council (NRC) believes that it will be possible to genetically engineer plants to become more tolerant to drought, salinity, and weak soils, to become capable of fixing their own nitrogen, and even to produce industrial chemicals such as polymers used in plastic. Genetic engineering can reduce the amount of phytic acid in corn, which stores phosphorous and eventually runs off into water with agricultural waste. (The report fails to mention that excessive presence of phosphorous is entirely due to the use of chemical fertilizers and pesticides.) Finally, these researchers suggest that food crops can be engineered to include elements essential for optimal health, such as vitamin A and iron, as well as distribute

⁵²“Environmental Effects of Transgenic Plants”; Vandana Shiva, *Betting on Biodiversity*.

⁵³“Environmental Effects of Transgenic Plants.”

⁵⁴Shiva, *Betting on Biodiversity*.

⁵⁵“Environmental Effects of Transgenic Plants.”

vaccinations for cholera (*Vibrio cholerae*) and travelers' diarrhea (*Escherichia coli*) by enhancing allergenic proteins that can be absorbed by the intestines.⁵⁶

The NRC maintains that transgenic crops are a “reduced-chemical” alternative to chemically intensive farming, and therefore are a more environmentally-friendly method of farming. In response to analyses that link the push to grow transgenic crops to profit-seeking corporations, the NRC believes analyses on the environmental impact of transgenic crops have become “entangled with domestic social issues that have no obvious connection to the environmental risks of transgenic crops.” The authors continue,

While environmental risks and social impacts are logically distant, they may have common causes that reside in what biotechnology firms do to make an adequate return on their research investments. Restricting the scope of an analysis on transgenic crops to environmental impact may seem justified in light of the way disciplinary scientific expertise tends to dissociate the causal factors that contribute to environmental impact from those that affect profitability and economic access to food⁵⁷

The compartmentalization of disciplines within the analysis of transgenic plants demonstrates the general logic of Capitalism—one that separates humans from nature, society from science, and rationality from humanity. Although they suggest that transgenic plants should be considered as an option for eliminating poverty and hunger in the world, “scientific expertise” does not permit discussion of the origins of poverty and hunger.

Ronald Herring, political scientist at Cornell University specializing in agrarian political economy, believes that the way that GM seeds have been framed in public mind has led to a great misunderstanding of the technology's potential and

⁵⁶“Environmental Effects of Transgenic Plants.”

⁵⁷“Environmental Effects of Transgenic Plants,” p. 241

efficacy in alleviating poverty and hunger. In the last few years, more developed countries, including the United States and several members of the European Union, have dramatically increased the acreage used for transgenic crops. He states that Vandana Shiva's claims of suicide by hundreds of farmers because of debt related to transgenic seeds are hard to authenticate, and "the powerful cognitive screen of biosafety and risk surrounding GMOs"⁵⁸ that is portrayed in the media by activist groups does not show how useful this technology has really been for farmers around the world. It is true that in the past, intellectual property issues around GM seeds has posed a problem for farmers, but now, as more governments and public institutions adopt an open-source approach to the technology, farmers have better access to seeds and can also participate more readily in the cultivation of varieties that will work for their environment.

Sir David King of Oxford University shares Herring's view. In his opinion, GM technology is the most practical solution to the food security issue in Africa. Organic farming is a lifestyle choice in the West whose impact on development policy and ideology is preventing farmers in poor countries from producing adequate food supplies. He claims that these "anti-science and anti-technology" attitudes⁵⁹ are responsible for keeping African nations in a constant state of crisis. However, King's analysis does not address the obvious link between the political and economic struggle and development policies related to agriculture. Daniel Howden, a prominent British journalist covering Africa, has publically refuted King's claims, citing a UN Environment Programme study that suggests organic small-scale farming practices both increase crop yields and prevents environmental social damage associated with

⁵⁸Robert Herring, "Opposition to transgenic technologies: ideology, interests and collective action frames," in *Nature Reviews Genetics* 9 (June 2008): 458-463.

⁵⁹Khadija Sharife, "Is GM food the future of Africa?" *New African*, no. 480 (January 2009), 9-13.

industrial farming.⁶⁰

Despite his more optimistic perspective on the use of transgenic seeds, Herring agrees that there are inherent risks for the world's poorest farmers:

"It is unclear how the global balance of forces on biotechnology will tip, but there is serious risk to the poorest farmers. Agriculture will almost certainly be stressed by climate change beyond anything seen historically. The poorest farmers have the least capacity to adjust. The worst case scenario would be a transgenics divide similar to the digital divide: technology lowers the costs of production for those with access, but leaves those without access at an even worse competitive disadvantage. But the weight of evidence suggests that the powerfully generative frame of GMO may well prove to be as ephemeral as it has been conjunctural."⁶¹

In *Biopiracy: The Plunder of Nature and Knowledge*, Vandana Shiva focuses on the use of biotechnology as a tool for imperialism. Development policies mirror the colonial imperatives to enclose and own knowledge and nature that are normally communal. She writes, "The same logic is now used to appropriate biodiversity from the original owners and innovators *by defining their seeds, medicinal plants, and medical knowledge as nature, as nonscience, and treating the tools of genetic engineering as the yardstick of 'improvement.'*"⁶² She challenges the patenting of indigenous knowledge for profit by multinational corporations. Dr. Shiva has been at the forefront of farmer advocacy in the face of growing pressure from the World Bank, the International Monetary Fund, and other development institutions to use biotechnologies. According to these development agents and the multinational corporations, genetically engineered crops are more resistant to chemical pesticides and pests and yield more crops than non-engineered varieties. The research of both

⁶⁰Daniel Howden, "Organic farming 'could feed Africa,'" *The Independent*, October 22, 2008, World section.

⁶¹Herring, "Opposition to transgenic technologies."

⁶²Shiva, *Biopiracy*.

Shiva and James Gethi refute these claims. According to Gethi's research on maize harvests in Kenya, local hybrid maize plants were significantly more resistant to weevils than genetically modified varieties.⁶³

Shiva identifies three types of seeds: 1) farmers' varieties, 2) high yield varieties, and 3) hybrid seeds. Farmers varieties are also known in the capitalist development world as *primitive cultivars* (vs. elite cultivars). They are perennial and sustainable and require the intellectual contribution of farmers within a society, who share knowledge and technique to meet the needs of a growing community. Farmers breed these seeds to adapt to new environmental conditions and diverse ecosystems. They are also commonly referred to as indigenous seeds, native seeds, organic seeds, heirloom seeds, and heritage seeds.

High yield varieties (HYV), developed during the Green Revolution, have a high resistance to chemicals (such as herbicides and pesticides). Shiva observes that the use of the term "high yield" is misleading, since the seeds do not actually produce *more* of the particular crop. She suggests that these varieties should be referred to as "*high response*" varieties (HRV), since they serve only to reduce the plants negative response to chemical application. HRV, for the sake of increasing yields of *usable* crops, compromises the quality of the crop. In fact, since the rise of industrial agriculture, the *nutritional value per acre* has dramatically decreased.⁶⁴

Hybrid seeds are the first generation seeds from two genetically dissimilar parent seeds. These seeds cannot be economically saved or replanted since the second generation of hybrid seeds have very low yield. They are "biologically patented" because it is impossible to duplicate them without the exact parent line.⁶⁵

⁶³James Gethi, "Post-Harvest Losses Control: Maize Weevil" (paper presented at the New York African Studies Association, Ithaca NY, April 4 2003).

⁶⁴Shiva, *Betting on Biodiversity*, p. 6

⁶⁵Shiva et al., *Seeds of Suicide*.

While farmers' seeds represent varieties that are innately regenerative and shared by all members of society, public sector seeds are short-term varieties (usually hybrids) that are produced for high yield production. In 1988, the World Bank dismantled the public sector seed supply and shifted to private sector supply. Private sector seeds are also short-term varieties used for high yield production, but private companies *own* the rights to these non-renewable, and therefore non-sustainable, seeds.⁶⁶

For farmers, the seed “is not merely the source of future plants and food; it is the storage place of culture and history...the first link in the food chain...[and] the ultimate symbol of food security.”⁶⁷ Thus, exchanging seeds “involves exchanges of ideas and knowledge, of culture and heritage. It is an accumulation of tradition, of knowledge of how to work the seed.”⁶⁸ Genetically engineering seeds is not merely a method of transforming and controlling its composition, but also a means of acquiring *ownership* of the seeds. In the Western tradition of private property, laws actually entitle the so-called *owners* to profit if their product is sold, and to reparations if their product is “illegally” reproduced. Thus, if a farmer develops a crop that bears the same traits as a modified or hybrid seed that is owned by a private corporation, that farmer could be accountable to the law for violation of *intellectual property rights*.

The greatest danger in the use of GM seeds is its implications on biodiversity. The logic of Capitalism requires *monoculture*—a homogenized society and agricultural system. According to Shiva, “a monoculture paradigm looks only at one element of a system and treats an increase in the part as an increase in the whole system. Thus, by focusing only on yield increases of grain of individual cereals like rice or wheat, the reduction of straw availability for fodder and nutrition from legumes

⁶⁶Shiva et al., *Seeds of Suicide*.

⁶⁷Vandana Shiva, *Stolen Harvest*.

⁶⁸Shiva, *Stolen Harvest*, p. 8

and oil seeds and greens is externalized and not accounted for.”⁶⁹ Such forms of agriculture contribute not only to the poor conditions of the land, but also cause *monoculture of the mind*. Moreover, analyses of monoculture production reveal that there is actually a decreased output per hectare, despite the fact that proponents of GM seeds claim that it will increase production and use less land. Monocultures are *proven* to be unsustainable—they create *irreversibly* poor ecological conditions that will affect our ability to survive.

The elusive language of GM seeds reveals the ultimate goals of Capitalism—to increase profits for the rich at the expense of other people and other organisms. Proponents claim two major benefits of this biotechnology that ostensibly contradict each other: 1) GM seeds are good for the U.S. and Europe because the anticipated increased crop yield will decrease dependence on countries in Asia and Africa; and 2) GM seeds are good for poor countries because it will give them a comparative advantage in the global economy. Furthermore, GM seeds are a cultural threat because the technology displaces indigenous knowledge and relocates expertise from local farmers to laboratory scientists. Finally, GM seeds and other biotechnologies such as hybrids and pesticides promote additional economic stress to poor countries by encouraging farmers to incur debts that they cannot pay. In 1998, one hundred farmers in Andhra Pradesh, India committed suicide because of debt incurred to buy pesticides for hybrid cotton, and thousands more since then have also taken their lives, sold organs, and sold their land throughout the country as a result of their increasing debt.⁷⁰ This cotton was supposed to *decrease* the use of pesticides and *increase* the economic stability of the farmers. One thing is clear—corporations develop, market, and sell seeds for the sake of profit, not for the sake of farmers.

⁶⁹Vandana Shiva, *Monocultures of the Mind: Perspectives on Biodiversity and Biotechnology* (Penang, Malaysia: Third World Network, 1993), 14.

⁷⁰Shiva, *Betting on Biodiversity*; Shiva, *Seeds of Suicide*.

CHAPTER 3

COMPARATIVE ANALYSIS OF WESTERN AND WOLOF VIEWS OF NATURE

Unlike the societies of our ancestors, “in every part of the world contemporary arguments about the way society should be organized now revolve around the health and management of the national and international ‘economy’...Economic thinking is now central to the way in which human societies treat the environment.”⁷¹ It is within this context of globalization that we find the most visible and potent clashes of ideology and values, especially between the colonizers and the colonized.

The fact that agriculture was a primary target of colonial expansion and also a great source of cultural tension indicates a fundamental conflict between the perceptions of the human relationship with the natural world. This chapter aims to distinguish those conflicting ideologies of nature, in order to facilitate a historical understanding of what capitalist development means for Senegalese culture and agriculture.

The West and Nature

In his book *A Green History of the World*, Clive Ponting asks,

Are humans an integral part of nature or are they separate from it and in some way superior to it? The answer to this question is crucial in determining how different thinkers and religions decide which human actions can be regarded as legitimate or morally justified...In the last two hundred years or so these religious and philosophical questions have been very largely overtaken by questions of economics—how should life be organized and scarce resources used and distributed.⁷²

⁷¹Clive Ponting, *A Green History of the World: The Environment and the Collapse of Great Civilizations* (New York: St. Martin's Press, 1991), p. 153.

⁷²Ponting, p. 141

The widespread acceptance of this attitude towards nature shares many historical and social circumstances with the rise of Capitalism, discussed in Chapter Two. Ponting documents the development of the notion that humans dominate nature in the European context.

Ancient Greek and Roman philosophers were the earliest to convey the anthropocentric ideology that the world and all of its parts have a specific purpose to serve human beings. In *Memorabilia*, Xenophon asserts that the natural world, including ‘lesser’ animals, were created for the service of humans. Aristotle enforced this idea by writing that the purpose of plants is to feed animals, which feed humans. Although humans venerated the gods, the purposes of the gods were to sustain human life through peripheral control of the natural world.

The notion of domination over nature was a major principle in the building of the Roman Empire. Once the Roman Empire began to disintegrate, the Jewish tradition of conquest helped to reunify the Empire through the rise of Christianity. In the Judeo-Christian creation story, Adam is given the power to “subdue” the earth. In fact, the Bible provides two separate accounts of creation, each of which underscores the dimensions of *man’s* power. The first grants *him* authority over the earth, and the second grants him authority over women.

Although it is true that Islam shares a similar notion of God with the Judeo-Christian tradition, there are several distinctions that become relevant in the discussion of the relationship between human society and nature. First, Islam’s implementation in West Africa allowed many people to retain indigenous knowledge systems, especially in agriculture. In fact, Islam helped to enhance agricultural methods and production by facilitating expansion in trans-Saharan trade. Furthermore, Islam’s popular acceptance in Senegambia was directly related to resistance movements

against colonization and slavery. The popular Sufi sect of Mouridisme, founded by the Senegalese ascetic Cheikh Amadou Bamba, values communal living and modesty. Finally, ideas of domination presented in the biblical creation story do not exist in the Q'uran. References to Eve's creation from Adam's rib are present in the sayings of the Prophet Mohammed (the Haddith), but *never* appear within the thirty-three accounts of creation in the Q'uran itself.⁷³

Although the Scientific Revolution introduced a more secular worldview to European thinking, many of the theories of the era retained the notion that humans dominated nature. René Descartes presented mathematical methods to measure and quantify things, which was “designed to reduce wholes to their constituent parts.”⁷⁴ This reductionist thinking

inevitably led to a fragmented view of the world—to focus on the individual parts of a system rather than on the organic whole, on studying the way in which the constituent elements operated separately rather than the ways in which they interacted, both by competition and co-operation.⁷⁵

Although capitalism had been introduced two centuries prior, this kind of thinking served as a backdrop for new economic models that facilitated capitalist expansion.

Markets for capital and labor gradually developed over the three hundred years

⁷³Riffat Hassan, “Women in Islam: Beyond the Images” (lecture, Wells College, Aurora, NY, November 17, 2003). In her essay “Members, One of Another: Gender Equality and Justice in Islam” (<http://www.religiousconsultation.org/hassan.htm>), Hassan contends that the subordination of women by some Muslim men is a misuse of the sacred Haddith text. The idea of women's inferiority to men stems from three assumptions: 1) God's primary creation was Adam, and Eve was a secondary creation (she was created to be submissive); 2) Eve was secondary in creation, but primary in guilt, accounting for the Fall of Man; and 3) Eve was created not only *from* Adam, but *for* Adam. Through her study of the Q'uran, Hassan identified about 20 uses of the word Adam (or Adama) to represent humanity, and not one single human being. The word “Eve” does not even exist in the Q'uran. There is sufficient evidence, according to Hassan, that the notion of the “rib story” was an influence of Christianity and Judaism that was recorded in the Prophet Mohammed's sayings (the Haddith), but it does not exist in the Q'uranic text.

⁷⁴Ponting, *A Green History of the World*, p. 147.

⁷⁵Ponting, p. 147

since capitalism emerged, but it wasn't until the eighteenth century that the market for land became mainstreamed. European society still maintained certain limitations on capitalist expansion, including those on wages and mobility, but especially on profit-making. Adam Smith's publication of the *Inquiry into the Nature and Causes of the Wealth of Nations* in 1776 stimulated a new way of thinking about the dynamic relationship between the economy and society. He argued that pursuing individual self-interest for material accumulation actually benefited society, and could be regulated through competition. According to Ponting,

His view was of a society engaged in a process of continual improvement to be brought about through investment, greater productivity and the accumulation of individual wealth. He shared the common eighteenth century belief in the inevitability of progress and assumed that the betterment of society was equivalent to the production of material wealth—an assumption that many might dispute since it leaves out a number of important values, but it is a belief that has been highly influential.⁷⁶

As discussed earlier, it is this kind of thinking that galvanized the laws of motion of Capitalism—competition, profit maximization, and accumulation. In other words, justification for these laws of motion could only be possible by establishing a notion of human uniqueness and domination over the natural world. Therefore, where this kind of thinking did not exist, capitalist development could not exist.

In the six hundred years that capitalism has been expanding, economic thinking has become the fundamental mode of operating society and understanding the environment. For all of its accomplishments in connecting all peoples of the world and fostering universal principles of human rights (if these things can be called accomplishments), economic globalization has consistently omitted the natural world

⁷⁶Ponting, p. 155

from its thinking. Ponting criticizes that all forms of economic theory

deal only with the secondary problem of the distribution of resources between different competing ends. The crucial defect is that the earth's resources are treated as capital—a set of assets to be turned into a source of profit. Trees, wildlife, minerals, water and oil are treated as commodities to be sold or developed. More important, their price is simply the cost of extracting them and turning them into marketable commodities.⁷⁷

In other words, certain elements of the environment, such as seeds, water, and minerals, are considered as quantitative inputs of a system of production. Moreover, the harmful byproducts of industry have only recently become regulated by only a handful of nations in the world.

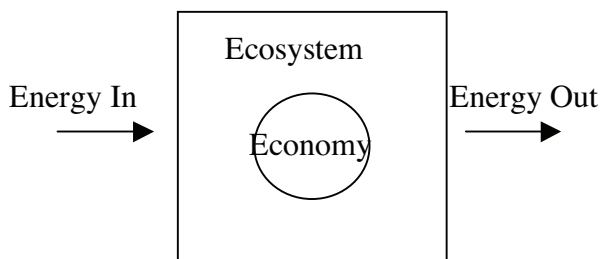
In the context of colonial agricultural in Africa, the conflicting ideologies of human's relationship to nature are quite visible. By replacing the existing biodiversity of indigenous agriculture with monoculture crops intended for export, European notions of human domination of nature affected the pre-existing notions of moderation and respect for the natural world. The hijacking of Africa's agriculture was further justified by racist ideas that Africans were savage and uncivilized. Charlton notes that for the French, who colonized the Senegambia region, "the blacks were not only miserable but deserved their misery...The theologian Bellon de St-Quentin, for example, asserted in 1764 that slavery is not contrary to natural law, nor to the written law of God, nor even to the law of the Gospel'; it is willed by God Himself—as well, he adds, as being socially useful."⁷⁸ Ironically, contemporary governments of former colonies from which millions of slaves were transported to the American colonies still condone the economic and agricultural practices established by the colonial

⁷⁷Ponting, p. 156

⁷⁸D. G. Charlton, *New Images of the Natural in France: A Study in European Cultural History 1750-1800* (New York: Cambridge University Press, 1984), p. 119.

governments, despite their fundamental contradiction to the lifestyle and ontology of African citizens.

Ultimately, Europe's expansionist socio-economic behavior stems from its intellectual and religious tradition of separating nature from humans. According to Ponting, "Nature is not seen as sacred and therefore it is open to exploitation by humans without any moral qualms—indeed humans have the right to use it in whatever way they think best."⁷⁹ Herman Daly's notion of the "full-world economy" demonstrates the consequences of this thinking in the contemporary world. The full-world economy "crowds out all forms of life not needed for immediate human consumption purposes; and it increases competition between rich and poor for control of ecological resources."⁸⁰ By the mid twentieth century, when the Bretton Woods agreements were formed, the world was operating in a "cowboy economy." Resources were unlimited, and the world was "empty," a wild frontier ready to be tamed. (See figure 1). However, today, we are in a "spaceship economy," where the world is "full," and the economy is relatively large compared to the ecosystem. (See figure 2).



*Figure 1. Empty World, Cowboy Economy*⁸¹

⁷⁹Ponting, *A Green History of the World*., p. 144.

⁸⁰David C. Korten, *When Corporations Rule the World* (San Fransisco: Berrett-Koehler Publishers, 1996)., p. 23

⁸¹Korten, p. 23

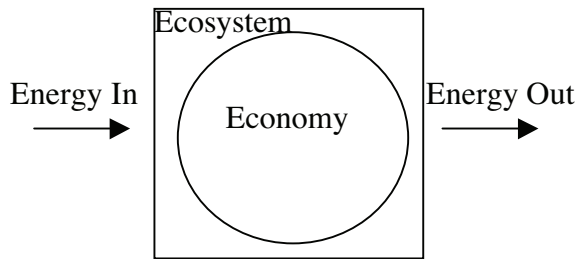


Figure 2. *Full World, Spaceship Economy*⁸²

Economic activity has depleted many of the world's natural resources in the name of development and progress. In Western countries, the environment has already been 'tamed,' and the people that live in them are conditioned to it. In fact, much of what is considered "natural" in the West is actually manufactured. For example, even though botanical gardens are a beautiful sanctuary for many plant and animal varieties, they are contrived and controlled environments that essentially mask the stark reality of economic development. Most of the original biodiversity has been destroyed by infrastructure, urbanization, and commodity agriculture. For instance, in the United States, particularly the Northeast, most of the forest is actually new growth, since the indigenous forests were destroyed during colonization, demonstrating little to no concern on the part of colonialists to preserve and connect with the indigenous environment.

Considering the West's perspective and treatment of its own environment, it becomes clear that despite mild (and very recent) efforts to assess environmental impacts of development in poor countries, the fundamental belief that nature is simply an externality to human 'needs' (such as material accumulation) permeate the ethos of development. In fact, those who advocate for sustainable living through subsistence

⁸²Korten, p. 23

farming and the development of small local (or informal) markets are considered to be politically radical, socially primitive, and economically external to the ‘modern’ world.

Modernization and Indigenous Knowledge

Before comparing the Wolof and Western views towards nature, it is important to discuss the notions of modernity and indigenous knowledge. Within the dominant Eurocentric paradigm, *progress* is a social practice that indicates a society’s intellectual capability and evolutionary potential. To be a *progressive* society means to be a society that is at the highest level of evolutionary performance, which is measured by the use of technology and the ability to contain and control nature. To be able to transport large amounts of commodities across oceans or to kill more people with fewer weapons were all signs of technological sophistication and advanced civilization from the European perspective. Condoned and encouraged by the Judeo-Christian commission to “subdue the earth,” European men’s domination over their women, their land, and the land of other (‘lesser’) people signified the fulfillment of their divine destiny.

In the contemporary world, the notion of modernity has not changed, but its manifestations have become more intricate, more powerful, and more discreet. Biotechnology is one of the most recent developments of ‘modern’ science. It demonstrates the European philosophical imperative to understand and manipulate nature from its most basic form and to control life. Biotechnology, or applied biological science, has been used in contemporary medicine and agriculture to produce a variety of commodities such as antidotes, fertilizers, and pesticides, to name a few. Although some biotechnology is beneficial to society, such as potential cures for cancer and HIV/AIDS, many products of biotechnology have become tools of private

corporations, whose ultimate goal, despite the humanitarian language used in marketing, is to increase profits.

Within the Western paradigm of modernity, ‘traditional’ practices (be it religious or agricultural or other) are confused with ‘ancient’ or ‘primitive.’ To the Westerner, an African person wearing ‘traditional’ clothing appears to have been transported from another century even if the garment was fabricated just one week before! But an African person wearing American-style clothing (such as blue jeans and a tee-shirt) is often cited as wearing ‘modern’ clothing. Thus, the term *modern*, while it denotes influence from Europe or the United States, connotes *better* or *more advanced* and fallaciously qualifies our sense of time and space.

According to M. P. Somé, technology is the way in which humans interact with the natural world. He writes,

Though Western culture aims at improving the quality of life (and has accomplished this, at least as far as the eye can see), these improvements have come at a price: humans have become indebted to their technology. To indigenous people, the individual in the West has been made a servant to technology; in the indigenous world, by contrast, technologies serve the individual.⁸³

In other words, the West sees technology as a tool for *progress* or *development*, which as discussed in Chapter Two, must occur at the expense of others, creating *underdevelopment*. Moreover, the Western definition of *technology* is one that requires mechanization, and its purpose is often to decrease *specialization* in the labor force, consistent with the imperative to maximize profits. Somé explains that in most African societies, technology does not necessarily require machinery, but rather embodies an intellectual process and spiritual relationship with the natural world. “In

⁸³Malidoma Patrice Somé, *The Healing Wisdom of Africa: Finding Life Purpose through Nature, Ritual, and Community* (New York: Putnam, 1999). p. 60.

the West, technology is oriented toward industrial, commercial, and military uses; among indigenous people, it serves to heal and help people remember and fulfill their purpose in life.”⁸⁴

In the context of agriculture, the Western tendency to understand the parts and operationalize society based on those parts instead of the whole has led to monoculture. In capitalism, agriculture is an organic factory that produces raw materials for industrial production and mass consumption. However, in the indigenous African context, agriculture is a life-support system that is specialized and depends heavily on a sophisticated understanding of biodiversity. Ironically, indigenous approaches to agriculture have been categorized as “traditional” and therefore inefficient and informal. Somé writes, “The problem is that wherever there is a yet-undamaged piece of the world, *modernity* tends to regard that place as *primitive*, *archaic*, and, at best, *preindustrial*.”⁸⁵

Mammo suggests a paradigm shift in understanding indigenous knowledge. Instead of placing “tradition” in a time warp and understanding it as something archaic, he proposes a “modernity of tradition,” which acknowledges the way in which each generation modifies traditions to fit their contemporary needs. When it comes to *development*, Mammo believes that local skepticism and resistant stems from experiences in which “foreigners and some foreign influenced local development practitioners attempt to implement new ideas, [and] they often forgot to think of how to communicate with the local people (inter-cultural communication).”⁸⁶ This “inter-cultural communication” requires more than simply translating the vocabulary of *development*—it requires translating *ideas* of accumulation, profit maximization,

⁸⁴Somé, p. 61

⁸⁵Somé, p. 72 [emphasis mine]

⁸⁶Tirfe Mammo, *The Paradox of Africa's Poverty: The Role of Indigenous Knowledge, Traditional Practices and Local Institutions: The Case of Ethiopia* (Lawrenceville NJ: The Red Sea Press, 1999). p. 179

globalization, and industrialization, among many others. In fact, the barrier between foreign development practitioners and rural communities is more than just one of language—it is one of ontology and purpose.

According to Somé,

the indigenous notion of abundance is very different from that in the West. Villagers are interested not in accumulation but in a sense of fullness. Abundance means a sense of fullness, which cannot be measured by the yardstick of the material goods we possess or the amount of money in a bank account. Abundance, in that sense of fullness, has a power that takes us away from worry. It is the kind of feeling you get when you are in communion with the natural, in communion with the source. There is the some sense in which the work, or the love of work, is the love of this kind of abundance.⁸⁷

In other words, for most rural African communities, the goal is to have *enough*, while in the West, the goal is to have *more*. From the Western perspective, however, to desire simply to have *enough* is a marginal way of life. Subsistence, even if it is sustainable, is perceived as “wasteful” because this type of life does not appear to realize the “full” potential of resources. This notion stems from the capitalist tendency to collapse time and space into one dimension—the here and now. Subsistence living is more than just living hand to mouth. It is a highly intellectual process that entails sensitivity for the past and for future generations.

African farmers who have participated in the so-called agricultural revolution have experienced some of the worst kinds of exploitation. They have been treated as if they know nothing about their own specialty, and their land has been almost irreparably damaged, especially in semi-arid regions like the Sahel, where the soil is nutrient-deficient and the rain only comes once a year. Somé poses a question that

⁸⁷Somé, *The Healing Wisdom of Africa: Finding Life Purpose through Nature, Ritual, and Community*. p. 68

many African farmers must ponder every day: “whom has this revolution benefited? Which of the world’s growing populations have been fed? Indigenous people see that food has flowed to the modern world more than to the indigenous world.”⁸⁸

Farmers in Senegal face dual crises of debt and ecological distress as a result of colonially-imposed industrial agriculture. Despite its presence in West Africa for over four centuries, capitalism and its imperatives have yet to be reconciled with indigenous cultures in the Senegambia region.

The Wolof and Nature

Although Senegal is home to several ethnic groups, the Wolof people constitute the largest percentage of the population at almost 44%, and the Wolof language is spoken widely even among non-Wolof people. Because of its widespread influence throughout the country, I have chosen to highlight elements of Wolof culture that reflect the popular view towards nature in rural areas of the Senegambia region.

In his study on Wolof philosophy, Assane Sylla observes what he calls horizontal and vertical solidarity at all levels of society, including political institutions and social mannerisms. Horizontal solidarity is an understanding of the dynamics between the living, while vertical solidarity entails the dynamics between the living, the ancestors, and descendants.⁸⁹ As an oral tradition, Wolof thought is expressed primarily through proverbs, folktales, and legends, which

...exprime ses convictions, montre bien que l’orientation morale de sa pensée est le résultat d’une profonde réflexion philosophique et d’une longue expérience de la vie en société. Il est aisé de montrer que cette option morale qu’il a su traduire dans les faits, influe sur toutes les activités de la vie quotidienne et notamment sur les activités économiques.

⁸⁸Somé, p. 72

⁸⁹Assane Sylla, "La Philosophie Morale Des Wolof" (L'Université de Grenoble II, 1976).

...expresses its convictions, and also shows that the moral orientation of its thought is the result of a profound philosophical reflection and an extensive life experience in society. It is easy to show that this moral option, which is known to be translated into actions, influences all activities of daily life and especially economic activities.⁹⁰

Sylla demonstrates the Wolof belief that an ethical or moral fault can have serious economic consequences. He cites an announcement in the local newspaper in which the government restricted festivities, including drumming, dancing, games, and wrestling matches, to ensure an abundant rain and harvest. While Westerners would consider this “superstition,” sober behavior just before the harvest fits the logic of subsistence living. During this season, food supply is limited, and festivities that usually include lavish feasts and generous hospitality are not practical.

The story of “The Passion of the *Gewel*” is a perfect example of how Wolof thought rejects notions of excessive accumulation and profit maximization. The story was narrated by Lamine Jeng in a Wolof village in the Gambia, and was documented and translated to English by Emil Magel. In the story, the *gewel* or griot wanted to build their own town. They found a Marabout (religious leader) to bless their plans. The Marabout gave them a *tere* (blessing) and an animal horn, instructing them to put them in the hollow of the biggest tree. This tree would serve as the village square, and they were to cut down all the other trees immediately surrounding it to make room.

Once they found a tree, they began to cut the other trees down around it, but an amazing thing happened. Every time they chopped a tree, millet would pour out of it. They became very excited and cut down many of the trees in their village. When they harvested their farms, there was also an abundance of food. Even the wood used for the fences separating their houses produced millet. One particularly overzealous

⁹⁰Sylla, p. 194 [translated by author]

woman began to sing,

AH, WE ARE ABOUT TO HAVE A TOWN.
OUR TOWN IS VERY GOOD AND PERFECT.
BECAUSE A PLANT OF *SEP* YEILDS A BARREL;
A PLANT OF *SUNA* YEILDS A SACK;
ONLY SIX BEAN PLANTS YIELD A SACK.⁹¹

Although one wise man warned against this kind of behavior, soon everyone began singing the song. They continued singing and chopping things down, and shortly after, the town fell into disrepair.⁹²

The story of the overzealous *gewel* parodies a complex issue facing Senegal and other developing countries today. African independence from European colonial rule marked an era of state formation and nation-building, in which Western economic imperatives have devastated the world's ecological stability. Like the *gewel* who discovered that simply cutting down trees yielded enormous crops, agricultural researchers, development professionals, and profiteering corporations seek ways to increase crop yields and decrease labor. Pressured by international development agencies and donor nations to increase GDP and achieve other development goals, the Senegalese government is turning to the agricultural sector to increase productivity.

While the story of "The Passion of the *Gewel*" warns against overzealousness and exploitation of natural resources, European folktales seem to encourage and value such behavior. Take for example the story of "Jack and the Beanstalk,"⁹³ in which the

⁹¹Emil A. Magel, *Folktales from the Gambia: Wolof Fictional Narratives* (Washington, D.C.: Three Continents Press, 1984), p. 51

⁹²Magel, pp. 50-2.

⁹³While there is no conclusive evidence of the origin of this folktale, it is widely believed that it originated in England. The oldest known written version of this story was published by Benjamin Tabart in 1807, but the more common version is based on Joseph Jacobs' version in *English Fairy Tales*, published in 1890. It is certain that the tale existed as part of the oral tradition of Europe for many years before it's written publication. See also http://en.wikipedia.org/wiki/Jack_and_the_beanstalk.

hero Jack exchanges his last asset, his cow, for a few magic beans. These magic beans grow into a massive beanstalk that leads Jack to a giant's home where he steals a goose that lays golden eggs and other treasures. Instead of being punished for his lazy and criminal behavior, Jack is rewarded for his ability to make a lot out of a little. Biotechnology has made those "magic beans" a reality. So-called "high-yield" varieties are meant to provide more output for less input.

According to the literature produced by Monsanto, one of the world's leading producers of agricultural biotechnology,

Les plantes génétiquement modifiées ont montré qu'elles peuvent aider les agriculteurs à améliorer nettement leur productivité, quand elles sont accompagnées de réformes économiques et sociales appropriées. La biotechnologie en Afrique doit être considérée comme un élément clé pour l'accroissement de la production agricole, pour l'éradication de la pauvreté et la protection de l'environnement.

Genetically modified plants have shown that they can help farmers improve their net productivity, when they are accompanied by appropriate economic and social reform. Biotechnology in Africa should be considered as a key element for the growth of agricultural production, the eradication of poverty and the protection of the environment.⁹⁴

Like Jack's "magic beans," genetically modified plants are supposed to endow African people with wealth and a healthy environment. A widely circulated pamphlet for Monsanto's Roundup herbicide entices farmers saying "*Semez votre maïs sans labourer* [Plant your corn without working]." These words encapsulate Capitalist notion of profit maximization by encouraging farmers to work less to produce more.

However, Jean-Pierre Ndiaye of the Senegalese Institute for Agricultural Research's Bureau of Macroeconomic Analysis remarked, "If you ask a farmer to

⁹⁴Monsanto, *Biotechnologie en Afrique: Terre Promis*, Abidjan, Côte D'Ivoire, p. 5.

cultivate improved seeds, you have to help them get the right inputs to produce it.”⁹⁵ In other words, implementing high output agriculture to boost national wealth must be accompanied by intense mechanization of agriculture. Although many agencies have initiated projects to mechanize agriculture throughout the country, few Senegalese farmers have the means to maintain and upgrade the technology over any significant amount of time.

Although Africa, and especially West Africa, has participated in global capitalism for almost five centuries, capitalist imperatives of accumulation, profiteering, and competition have not yet infiltrated the ontology of many Africans. In fact, indigenous values and culture seem to blatantly resist those imperatives. While the Western view of nature divorces matter from meaning, the African perspective focuses on meaning and understands things beyond their physical appearance. For example, while Western science seeks to classify and distinguish all species by their simplest form, in Wolof the word *doom* means both *fruit* [*doom b-*] and *seed* [*doom j-*]. The word *garab* means both *tree* [*garab g-*] and *medicine* [*garab b-*].⁹⁶

The forceful implementation of capitalist doctrine continues to affect Senegalese society through the neo-colonial development policies endorsed by rich countries such as France and the United States, by international organizations like the World Bank and the United Nations, and by private corporations like Monsanto. Even the Senegalese government seems to believe that industrial agriculture will help to reduce Senegal’s external debt and increase wealth within the nation. Acceptance of these notions by the government limit the expression of self-determination in economic and social policy.

⁹⁵Jean-Pierre Ndiaye, Interview with Author, 23 July 2003.

⁹⁶Jean Léopold Diouf, *Dictionnaire Wolof*, Tokyo: Tokyo University of Foreign Studies ILCAA, 2001.

CHAPTER 4

HISTORY OF AGRICULTURE IN SENEGAL

The ability of a community to cultivate a sustainable source of food depends entirely on farmers' ability to breed and improve crops that will adapt to their environment. Although plants are capable of adapting themselves to the environment over time, farmers can manipulate specific traits in order to increase their rate of survival and the availability of a specific plant for consumption. *Contrary to the logic of Capitalism, this type of innovation is completely self-initiating, and exists outside of a supposed impetus to compete and increase profits.* However, the Industrial Revolution would change the face of agriculture across the globe by transforming its role in society from a sustainable life force to a commodity whose meaning derived from its monetary value in the market. African labor played a major role in this *industrial* agricultural production in the New World and on the continent.

By the 19th century, European colonizers drastically transformed the agricultural and ecological integrity of the African continent to accommodate their Capitalist interests in profit maximization and capital accumulation. Instead of allowing farmers to determine what crops they would cultivate, European imperialists dictated what crops would benefit the European economy and even provided seeds. Despite political independence, post-colonial agriculture in many parts of Africa remains alarmingly similar to colonial agriculture. In this chapter, I will explain the historical evolution of Senegalese agriculture and demonstrate how colonial agricultural policies have impacted the contemporary ecology and food security.

Pre-colonial Agriculture

There is a limited amount of scholarship on pre-colonial agriculture in West Africa. What is absolutely certain is that the environment was by no means pristine. There were already problems with desertification, but cultural dynamics prevented the exacerbation of poor soil conditions and water accessibility. Indigenous cultures had adapted to the local environment, allowing agriculturalists, nomadic pastoralists, and even urban city-dwellers to live a sustainable lifestyle for centuries. Over time, there were pressures from increasing population in urban centers, but the environmental impact was no comparison for the changes that would happen during colonialism.

Archaeological evidence suggests that agriculture in West Africa existed as early as 6000 BCE.⁹⁷ In their study on the origin of cultivated plants in West Africa, Portères and Barrau explain N. I. Vavilov's theory of the origin of the cultivation of some plants.⁹⁸ While Vavilov locates only one of the eight centers of primary mutation in Africa, Portères and Barrau contend that in addition to the "Abyssinian" [Ethiopian] center, there are also two more in East African and West Africa. Primary centers are geographical locations where domesticated varieties of specific plants first emerged. Each primary center contains secondary centers that had more local significance. A primary center is characterized by the presence of "very great diversity in any particular plant...combined with continuing dominant characteristics, and, on the other hand, sub-areas of secondary mutation which show many recessive characteristics which were masked in the centre of primary mutation."⁹⁹ A location with multiple centers of mutation constitutes a 'cradle of agriculture,' which indicates

⁹⁷C. T. Shaw, "The Prehistory of West Africa," in *General History of Africa I: Methodology and African Prehistory*, edited by J. Ki-Zerbo, pp. 611-55 (California: Heinemann, 1981).

⁹⁸P. Portères and J. Barrau, "Origins, Development, and Expansion of Agricultural Techniques," in *General History of Africa I: Methodology and African Prehistory*, edited by J. Ki-Zerbo, pp. 687-705 (California: Heinemann, 1981).

⁹⁹Portères and Barrau, p. 693.

the longevity of whatever civilization participated in the alteration and domestication of plants.¹⁰⁰

Based on these criteria, West Africa can be considered a ‘cradle of agriculture,’ in which several civilizations were able to thrive because of their ability to adapt specific plants to meet their dietary and economic needs. In fact, the Senegambia region is considered by Portères and Barrau as a ‘centre of secondary mutation,’ in which the recessive traits of specific varieties of sorghum (e.g. *Sorghum gambicum*) and rice (e.g. *Oryza glaberrima*) first appeared. The drastic increase in the production of pearl millet from 3% to 60% around 1000 B.C.E. is consistent with the rise of the major empires in West Africa (i.e. Ghana, Songhay, Mali, and Benin). Although there is strong evidence of intercultural exchange of agricultural knowledge, particularly between African and Asians, Portères and Barrau insist, “African agricultural civilizations were endogenous and based on plant resources deriving from local natural environments and without any necessary implication or influences from outside the continent.”¹⁰¹ In addition to the evidence of sophisticated breeding methods, Portères and Barrau note that early African farmers developed advanced systems for preparing fields including such innovations as using fire to clear the bush and fertilize soil. This method is still used today, although the pressure to decrease the amount of time fields are left fallow undermines such activities.

Historians Boubacar Barry and Cheikh Anta Diop in their respective works demonstrate that capitalist imperatives of profit maximization, accumulation, and competition were by no means a prerequisite for sophisticated farming and trade. Diop specifically identifies that the nature of African society’s relationship to their environment prohibited the development of such imperatives because no person was

¹⁰⁰Portères and Barrau

¹⁰¹Portères and Barrau, p. 699.

allowed to *own* any part of nature.

According to Diop, the idea that Africa's pre-colonial economy was solely subsistent, using a primitive barter system is a gross misconception. For Western thinkers, "Notions of money, credit, stock market, thrift, or accumulation of wealth by individuals belong to a type of commerce connected with a higher economic organization: they could not have been found at the alleged level of African economy."¹⁰² However, Diop explains that within the sophisticated political economy of the Songhai and Ghana empires, the merchant class operated out of the international trade centers at Timbuktu and Djenné and used the Niger River as the main conduit of goods and services. Other cities along the River also served as peripheral markets along trade routes. Despite language, cultural, and religious differences, Africans from all over the continent were able to participate in the economy, using methods like silent trade to transcend the differences they had. The African market was strictly regulated through fixed market days. In the city, the market was open everyday, while in smaller towns the market would open periodically during the week to accommodate the needs of surrounding villages.

There were also several types of currency used throughout Africa, including salt, cowries, gold, rare fabrics, and cereals, which were assigned their value based on their scarcity. The West African economy exported extracted minerals and metals (e.g. gold, iron, tin), agricultural goods (e.g. cola nuts, dora, and millet), and manufactured goods (e.g. weaponry and glass) mostly to East Africa, India, and China. West African imports included wheat, raisins, figs, Saharan salt, cowries, copper, dates, henna, olives, tanned hides, silk, mirrors, tobacco, gum, asbestos, and agate,

¹⁰²Cheikh Anta Diop, *Precolonial Black Africa: A Comparative Study of the Political and Social Systems of Europe and Black Africa from Antiquity to the Formation of the Modern State*, trans. Harold J. Salemon (Westport CT: Lawrence Hill & Co., 1987), p. 130.

among many others.¹⁰³

Agricultural methods in West Africa were technologically advanced compared to those of Europe. While European agrarians did not begin to use methods like crop rotation until the fifteenth century, West African farmers has mastered the system, as well as irrigation and manuring and developed a number of technological advancement to make crop production more efficient and available for both consumption and sale in the centuries before.¹⁰⁴ Centralized farming communities were heavily dependent on nomadic people and their herds to provide manure for the fields.

According to Boubacar Barry,¹⁰⁵ both Islam and the old Mali Empire were the greatest influences on the organization of Senegambia's economic, social, and political life. At the time of the Portuguese invasion, there were several ethnic groups inhabiting the region including the Wolof, Peul, Toucouleur, Mandingue, Sereer, Soninke, Susu, Diola, Nalu, Baga, Beafada, Bainuk, and Basari. While there were certainly periods of transition, sometimes violent, between different types of political systems and social hierarchies, Barry maintains that there was still a general "cultural unity" reflected in political and social institutions. He writes,

This unity was primarily based on similar economic conditions in a context of self-sufficient domestic subsistence economies. These societies were essentially agricultural. The only exceptions were certain Peul groups on their nomadic journeys from the Futa Jallon plateau to the borders of the Ferlo on the banks of the Senegal River, as well as a sprinkling of Berbers from Chamana...Production was based on an idea of collectivism supported by lineage and extended family ties. Land ownership was tied to production and reproductive relationships. It could not be acquired as a simple commodity. Neither could it be traded or transferred in such a way as to divorce it from the social context that

¹⁰³Diop

¹⁰⁴Diop

¹⁰⁵Boubacar Barry, *Senegambia and the Atlantic Slave Trade*, trans. Ayi Kwei Armah (Cambridge: Cambridge University, 1998).

gave it economic and use value.¹⁰⁶

Barry maintains that the abundance of land contributed largely to the distinctive concept of “ownership” in the region. It was still a major foundation of political power, but conflict about land only arose when there was a particularly large influx of newcomers to the region. However,

territorial conquest was not the basis of political affairs in the Senegambian states, because the dual system of community heads and territorial rulers was maintained even within monarchical institutions. The practice of vesting land management in territorial rulers did a great deal to frustrate the development of a strong central authority within the kingdoms. It was also, in part, the reason why confederal systems were so popular in Senegambia.¹⁰⁷

As Barry and Diop suggest, there were unique and sophisticated economic, social, and political systems in West Africa before the arrival of Europeans. However, according to the formula described in Wood’s commercialization model, there was no capitalism. In other words, competition, accumulation, and profit maximization were not the imperatives behind the production, exchange, and innovation. Diop’s observations confirm the fallacious nature of the European commercialist model of capitalist development. Africa had many similar elements of economic organization to Europe including market exchange, currency, and division of labor. However, these elements do not indicate an evolutionary transition toward capitalism, which assumes that the desire to accumulate wealth is part of human nature and its execution indicates a higher level of human existence.

Comparing Diop’s research with Woods’ argument, it becomes clear that the divergence of economic development between the two cultures is the issue of

¹⁰⁶Barry, p. 30

¹⁰⁷Barry, p. 31

property. Enclosure was a specific historical event that allowed landlords to systematically acquire wealth using land and other people's labor. Not only was the acquisition of wealth important, but it was also important to accumulate wealth. Diop explains that this notion of accumulating wealth simply was not a core value of African society.

It seems that it was the African collectivism,...the moral and material security it assured every individual, which made useless, if not superfluous, the accumulation of excessive wealth; even the riches of the king do not seem huge by modern standards. Hoarding, usury, and all forms of excessive concentration of individual wealth are only the reflection of social anxiety, uncertainty about tomorrow, a sort of shield for oneself and one's kin against a cruel fate. It is an individualistic society that we see the great growth of such a phenomenon: this was true of the West throughout history. Indo-Aryan individualism, dating from earliest antiquity, and the feeling of social insecurity inherent in it, developed the spirit of struggle for life more than anywhere else...The technical and intellectual progress due to constant and necessary busyness, the energy with which one must imperturbably amass ever more wealth, the peculiar forms that these activities assume and their repercussion upon the social order, the development of mercantilism—all these seem to flow, in large part, from the same initial principle.¹⁰⁸

What Diop enforces is that believing the commercialist model is linked to the conceptualization of property.

While the European Age of Enlightenment, discussed in Chapter 2, highlighted the European tendency to value individual freedom, African ontology tended to be more collective, not only in terms of the human spirit, but also in terms of humans' relationship with nature. According to Mazrui, "The indigenous belief systems of Africa did not assert a monopoly of the soul for the human species alone. A tree, a mountain, could have a soul. A river, in spite of its flow, could retain a soul. African

¹⁰⁸Cheikh Anta Diop, *Precolonial Black Africa*, p. 158-9.

religion is respectful of living creatures other than Man.¹⁰⁹ The idea of nature having a soul and the mutual respect between nature and humans was in no way separated from the economy of pre-colonial Africa. In fact, ideas about nature informed the way in which agriculture and manufacturing developed. The idea of owning and dominating the land was not in the consciousness of pre-colonial African society. According to Diop, the idea of *domain* is more appropriate than the idea of property when discussing land distribution in pre-colonial Africa. An African ruler's stature was based on "human domain," in other words, how many people working on the land were loyal to him. The sale of land was strictly prohibited by indigenous beliefs.

He [the king] has received the land in trust; he never sells it—he would not dare to do so for religious reasons—he allots only the use of it. The sale of land, properly speaking, seems to have been unknown in traditional precolonial Africa...We might go even further and observe that, in truth, the problem of land ownership appears never to have existed in Africa. Instead of land having constituted a wealth beyond the reach of certain social categories, it was within everyone's grasp, with no need to forfeit one's freedom, like the serf bound to the soil, in order to make use of it, to 'possess' it. The slave has his own patch of ground. The stranger who just this morning came to the village would also get his. Expropriation of this sort seen in sixteenth-century Europe was unthinkable in the history of precolonial Africa. Perhaps, it was the vast expanse of arable lands that shielded Africa from this social problem. So Africa never had the rural capitalist who was the farm-owner acting as intermediary between the true owner of the soil and the expropriated agricultural wage-earner."¹¹⁰

The African economic model is clearly very different from the commercialist model. However, European imperialism in Africa imposed capitalist principles of accumulation, competition, and profit maximization, resulting in the many contradictions in Africa's political economy today.

¹⁰⁹Ali A. Mazrui, *The Africans: A Triple Heritage* (Boston MA: Little, Brown and Company, 1986), p. 51.

¹¹⁰Cheikh Anta Diop, *Precolonial Black Africa*, p. 150.

Moreover, the pre-colonial West African trade economy was *not* dependent on agriculture, but rather on extraction, hunting, and specialized crafts. Due to the precarious environmental conditions, agriculture was a strictly *subsistent* activity. While certainly agricultural goods may have been traded in local markets, these goods were not a significant part of regional or international trade. Senegambian people were known specialists in dying fabrics, jewelry-making, and iron-making. These crafts are still a major part of the local economy. The intensification of agriculture and the rise of the plantation economy in the Senegambia region did not occur until the middle of the nineteenth century, when French colonialists advocated the cultivation of groundnuts to provide a cheap alternative to walnut oil used for cooking in France.¹¹¹

Agriculture in the Colonial and Neo-Colonial Contexts

In *Neo-Colonialism in West Africa*, Samir Amin dissects the relationship between dependency in Senegal and other West African countries and colonial economic growth strategies. He asserts that Senegal's specialization in groundnuts, "which is related not to the natural potential of the country but only to the interests of France, is at the root of the social distortions handicapping the economy."¹¹² In 1884-85, Senegalese farmers located around the burgeoning railway produced 45,000 tons of unshelled groundnuts. By 1914, industrial groundnut cultivation spread to the Sine Saloum region, and increased production to 200,000 tons. In the mid-1930s production was at 600,000 tons per annum, and by the 1950's farmers in Casamance and Eastern Senegal were recruited to help increase groundnut production. By the mid-1960s, Senegalese farmers were producing over one million tons of groundnuts

¹¹¹Samir Amin, *Neo-Colonialism in West Africa*, trans. Francis McDonagh (New York: Monthly Review Press, 1973).

¹¹²Amin, *Neo-Colonialism*, p. 3.

per year.

However, by the time Amin's book was published, Senegalese farmers were only receiving a seventh of what they received in the 1880s when groundnut production took off. Amin estimates that if Senegalese farmers were to be compensated for the devaluation of their labor as of 1973, France would owe Senegal 1.8 trillion CFA or 20 billion CFA per year. It is important to also remember that that median population of Senegal between 1885 and 1965 was only 2 million. Amin succinctly concludes, "Even a crude attempt to measure the amount of income transferred from the Senegalese peasant to France by this deterioration shows how far the 'world market mechanism' is a synonym for robbery."¹¹³

Colonialism's ultimate triumph, however, was not in its tangible practice of groundnut cultivation, but rather in its ability to create "the belief that the land of Senegal could produce nothing but groundnuts."¹¹⁴ A sophisticated infrastructure of industrial transportation, seed distribution, and agronomic research centered on groundnut cultivation and industrial processing would outlast colonization and continues to thrive in the contemporary era of nominal independence. Amin even cites the same research institute at Bambey where I collected much of my data on seed research and distribution as a hub of agronomic research devoted to groundnuts.

The indigenous economy based on extraction, skilled labor and subsistence farming would be replaced with an industrial monoculture. Senegal became a leading manufacturer of groundnut products, and France designed the colony to manufacture those products from start to finish. The French provided seeds and supported on-site seed research, development, and distribution. Senegalese farmers cultivated the seeds and sent them via the newly constructed railway to factories throughout the colony.

¹¹³ Amin, *Neo-Colonialism*, p. 11.

¹¹⁴ Amin, *Neo-Colonialism*, p. 14.

The products arrived in Dakar ready to ship to Europe, where the products could be sold for a considerable profit for French businessmen. Thus, Senegal's colonial role as a groundnut plantation through France's colonial growth strategy based on 'international specialization' would have lasting policy implications long after independence.

Like all businesses, soon the groundnut business in Senegal became unprofitable, especially as France dealt with post-war reconstruction, political agitation in the colonies, and the waning ecological conditions of the colonies. When Senegal became independent in 1960, groundnut cultivation was suffering from severe ecological deterioration and from poor management. To make matter worse, the entire Sahel region was devastated by a drought in the 1970s.¹¹⁵ Agricultural production came to a screeching halt, and famine became a serious problem.

Although Senegal has recovered from the immediate repercussions, the soil is still very saline and volatile. For an economy based almost entirely on groundnut-product manufacturing, the harvests have not been enough to maintain global standards of wealth and debt management. In fact, Senegal has incurred billions of dollars of debt in an attempt to "develop" and achieve some ethereal sense of economic stability. Currently, Senegal is listed as one of the International Monetary Fund's Heavily Indebted Poor Countries (HIPC).

The Poverty Reduction Strategy Paper of 2002 (described in more detail

¹¹⁵In the past decade, global dimming has been identified as a major cause of the drought across the Sahel in the 1970s and 1980s. Pollutants from industrial activity in highly industrialized regions like North America and Europe eventually bond with water molecules in clouds. When water molecules stick to these pollutants in clouds, the clouds become more reflective, preventing sunlight from reaching the earth's surface. In addition to the increasing dimness, there is also a decrease in temperature. The decrease in temperature has been disguised in part by global warming, which explains why it took so long for anyone to notice the global dimming in the first place. By the 1970s and 1980s, the dimming and cooling of the earth's surface caused tropical rain patterns to move slightly south. Therefore, seasonal rains that normally occurred across the Sahel region started to appear just south of the region, causing massive drought and famine. See L. D. Rotstayn and U. Lohmann, "Tropical Rainfall Trends and the Indirect Aerosol Effect," in *Journal of Climate* 15 (2002): 2103-2116.

below) is one of the more recent attempts to alleviate this debt and increase wealth within the nation. However, like other attempts, it relies on the continued growth of the groundnut industry and other burgeoning agricultural products to contribute to economic growth, demonstrating the *reactive* nature of economic and environmental policies in former colonies. The national government, international organizations, and donor countries continue to pour resources into seed research and development. Meanwhile, the agricultural sector continues to yield mediocre results, while other sectors, like services and industrials, continue to experience difficulty attracting the external and internal investments necessary for growth.

Seed Research, Development, and Distribution: Summary of Selected Documents at the Senegalese Institute for Agricultural Research (ISRA) at Bambey

Bambey has served as the hub of agricultural research in Senegal since the colonial period. It now serves as the central location of seed research and development for ISRA, and attracts agronomists from all over the world, who are interested in the development of “improved varieties” compatible with tropical climates in the Third World. The library contains documents and reports on agricultural research from the early twentieth century to the present. The documents that I summarize below represent the research priorities of the past three decades as well as the political motivations that have informed the direction of seed research and distribution.

Aliou Adoum Abdoulaye, in his 1983 study on the production, control, and utilization of seeds for sorghum, corn, and niébé (a local variety of tuber) production described the unvarying goal of seed research and development in Senegal:

L'importance de choix de varieties bien adaptées au milieu est capital...les plupart des varieties dites locales replissaient ces

conditions avant la modification récente des systèmes de culture, par l'introduction pour des cause diverses, des maladies et des parasites... Les traitements contre les ennemis de culture son, lorsqu'ils sont possible, fort coûteax. Ainsi onn doit s'orienter vers la recherché des varieties résistantes, tolérantes ou moins sensibles.

The choice of varieties well-adapted to the environment is of capital importance...Most so-called local varieties folded under these conditions before the recent modification of culture systems, with the introduction of new sicknesses and parasites...Treatments against these enemies of culture are, when they are possible, extremely expensive. Thus, we must orient ourselves towards the research of resistant, tolerant, or less sensitive varieties.¹¹⁶

In the 1970s, countries in the Sahel experienced a devastating drought that caused a massive food crisis throughout the region. Since then, the Senegalese government has focused on research and development of seeds to help recover from the disaster and to prevent future devastation. The term “food security” or “*autosuffisance alimentaire*” began to appear in all of the literature on development, and most researchers concluded that this goal was only attainable with more research and development of “improved” seeds that would maintain high yields despite harsh environmental conditions.

The Fonds Européen de Développement (FED) financed a major project to produce and distribute *semence sélectionnées* (selected seeds) in the 1970s, starting with groundnuts within a few years adding more varieties including sorghum, millet, corn, and rice.¹¹⁷ The purpose of this project was to put at the disposal of farmers “*des semences de haute qualité constituant l'un des moyen les plus efficaces pour accroître sensiblement la production agricole, industrielle, et vivrière* [high quality seeds

¹¹⁶Alio Adoum Abdoulaye, “Production, Contrôle, et Utilisation des Seemences de Bases d'Espèces Diverses: Mil, Sorgho, Maïs, et Niébé,” (Bambey, Senegal: Centre National de Recherches Agronomiques, 1983), p. 6.

¹¹⁷Marius Bono and Magatte Lam, “La Production de Semence Sélectionnées d'Espèces Vivrières au Sénégal” (paper presented at the Colloque AAASA, Dakar, Senegal, 1975).

constituting one of the most effective ways of sensibly stimulating growth in the agricultural, industrial, and livestock production].”¹¹⁸ After calculating the needs of farmers throughout the country against the proposed funding of the FED, Bono and Lam concluded that the funds were not sufficient to reach the productivity goals of the state, and that the goals of the state were not consistent with the capacity of the land. First, the seeds that were distributed were used mostly for subsistence farming, which did not produce the anticipated economic results. Secondly, once bred with local varieties, the seeds distributed by the FED were not particularly successful in the dry climate of the Sahel.

Bono and Lam did not have much confidence that the farmers of Senegal would use the seeds the “right” way – in other words, the fact that they would use the seeds for subsistence and then breed them with local varieties completely defeated the purpose of the project, which was to stimulate growth in the national economy through agriculture. Despite the shortcomings of the FED project, Bono and Lam commended the Senegalese government for their efforts to create agricultural policy to regulate production and distribution of seeds.

For them, the success of agriculture in Senegal depended entirely on the ability of researchers to produce “good” seeds and of the government to provide effective techniques for *vulgarization*, the process of introducing the improved seeds to peasant farmers. They wrote in their 1975 paper,

En milieu rural les difficultés sont surtout dues à la nature allogame des espèces à multiplier qui impose des conditions très rigoureuses ou bien l'application de techniques particulières, sur des périodes très courtes...entièrement nouvelles pour le paysan multiplicateur qui doit donc aussi être “formé.”

[In rural areas, difficulties are due in large part to the allogamous

¹¹⁸Bono and Lam [Translated by author].

nature of multiplying/reproducing species that impose their very rigorous conditions or rather the application of particular techniques, during very short periods...entirely new to the multiplying peasant that must also be “trained.”]¹¹⁹

Abdoulaye identified several different types of hybrids used by Senegalese farmers. While farmers tended to breed Senegalese varieties, seed researchers also used imports from the United States, Latin America, Egypt, and Russia. Most of the hybrids had to be renewed every year as the yield of second generation hybrids was dramatically lower than the first generation. Naturally, the state faced several difficulties in maintaining adequate production of these “improved varieties” including high costs of production, inadequate equipment to accommodate production, poor budget planning, and the low sale price of the seeds.

One of the most difficult challenges in implementing the use of improved seeds is ensuring certification of the seeds and acquiring contractual agreements with farmers to use certified seeds. During distribution, the seeds are sold at a rate determined by the projected revenue of the harvest. The difference, if any, is met by the Fond Mutuel de Developpment Rural (FMDR), a subsidiary of the Ministry of Rural Development.¹²⁰ However, Abdoulaye notes that in reality, farmers do not use enough of the certified seeds because they are more interested in producing enough for family subsistence than for profit. He blames this fact on several reasons including the fact that improved seeds require more care and input. Moreover, he maintains, rural farmers are not convinced that the return will be greater with the use of “improved seeds.”

By the mid-1980s, the question of whether farmers should continue to develop

¹¹⁹Bono and Lam

¹²⁰Abdoulaye 1983; Adame Keita, “Programmation, Contrôle, et Certification des Semences” (paper presented at Les Semences d’Arachides: Génétique, Production, Technologie, et Diffusion, Dakar, Senegal, 1991).

personal seed reserves became quite controversial. A survey conducted by the several regional development societies revealed that personal seed stock constituted 48% of all seed capital.¹²¹ Only 1% of that stock was actually sold on the market. According to Gaye and Diouf's theory based on calculating the cost of seed production to its actual sale price in the market, farmers should have been more willing to buy them. However, in reality, there was a greater tendency for farmers, especially women and dependent men, to produce and use their own stock. Those who chose to buy their seed had no consistent reason. Only 53% of those who bought their seeds responded that they did it for better harvest. Other reasons included using the sale value of the harvest to fund a specific purpose, lack of infrastructure to stock personal reserves, and accidental loss of personal reserves.¹²²

In his paper presented at a conference on groundnut seeds in Dakar, Senegal, Adame Keita discussed the *Nouvelle Politique Agricole* (New Politics of Agriculture), which entails a system of control to combat the increase of sale prices of seeds while maintaining the quality of the seeds. It includes a more centralized system of seed certification, which would be determined by the Ministry of Agriculture's Division of Seeds (DISEM). The widespread circulation and use of uncertified seeds throughout the country not only affects the price of certified seeds, but also affects the quality of output, since the uncertified varieties are second generation hybrids.

O. Seck believes that the unstable price of seeds in Senegal is related to state regulation of seed research, production, and distribution through its own subsidiaries. The price and sale of seeds by government businesses:

...a conduit les paysans à réduire leurs achat en utilisant de plus en plus leurs propre reserves et le marché parallele: l'objectif annoncé

¹²¹Matar Gaye and Cheikh Diouf, "Les Semences Personelles d'Arachide dans les Régions de Fatick et Kaolack," (Dakar, Senegal: Département Systèmes Agraires (BAME) de l'ISRA, 1987).

¹²²Matar Gaye and Cheikh Diouf, 1987

de renouvellement par tiers n'a jamais été réellement atteint. Cette tendance risqué, à la limite, d'aboutir à la suppression de toute production de semences certifiées, alors que l'existence d'un secteur coordonné et contrôlé de production et de vente de semences est nécessaire pour l'avenir de la filière.

...has led peasant [farmers] to stop buying seeds, using instead their own reserves and the parallel market: the original objective of step by step renewal was never actually reached. This tendency threatens, at the very least, to end in the suppression of all production of certified seeds, thus the existence of a coordinated and controlled sector of production and sale is necessary for the future of the subsidiary.¹²³

It is because of these challenges of price control and seed certification that the government decided to privatize the seed sector in the late 1980s, slowly dissolving the state-owned SONAGRAINES and licensing several private corporations for seed production and distribution. SONAGRAINES, at the time of these discussions, was operating on a deficit of over two billion CFA.¹²⁴ Mamadou Cissé attributes the dramatic increase in scope of distribution and quantity of production of seed between 1988 and 1992 to five principal seed distributors: Sahélienne d'Entreprises de Distribution et d'Agro-business (SEDAB), L'Union Nationale des Coopératives Agricoles du Sénégal (UNCAS), Association Régionale des Agriculteurs de Fatick (ARAF), Association des Jeunes RISSO (AJRISSO), and L'Union des GIE des Ententes des Groupements Associés du Sénégal (UGIE).¹²⁵ These private distributors are mostly associations of local economic interest groups that usually consist of thousands of farmers from villages across the country. For example, UNCAS, founded in 1978, is a union of over 338 rural cooperatives with over 80,000 members

¹²³O. Seck, "Le Renouvellement des Semences d'Arachide au Sénégal: Un Secteur Privé pour un Nouveau Partage des Responsabilités" (paper presented at Les Semences d'Arachides: Génétique, Production, Technologie, et Diffusion, Dakar, Senegal, 1991).

¹²⁴Mamdou Cissé, "Projet Autonome Semencier: Note sur la Privatisation de la Filière Semencière d'Arachide," Dakar, Senegal: Institut Sénégalais de Recherches Agronomique, 1992.

¹²⁵Cissé, p. 4-8.

that organizes the production and commercialization of seeds. In addition to producing and distributing the seeds, these associations also offer credit services to member farmers.

With the help of these burgeoning private distributors, SONAGRAINES was able to balance its deficit. However, by 2002, in compliance with World Bank and IMF poverty reduction initiatives SONAGRAINES and the state groundnut processing company SONACOS were both encouraged to privatize. Failing to find buyers for the business, SONAGRAINES was dissolved, leaving many farmers angry and on the brink of famine as they were unable to distribute the years products effectively.¹²⁶

SONACOS was finally privatized in December of 2004, in its third attempt since the 1990s. A consortium of Senegalese enterprises, including an employee-established firm, led by Lebanese-owned transport company Advens agreed to acquire 66.9% of the shares. The remaining shares went to SONACOS employees and other “entities active in the groundnut sector.” The government retained only 5% of the shares.¹²⁷

While the privatization of SONACOS represents a major milestone in Senegalese economic history, recent world political events could jeopardize its ability to attract investment and support from certain countries invested in the illusory War on Terror. The US’s Financial Anti-Terrorism Act, a component of the Patriot Act, and other legislation requires financial institutions in the US to investigate with due diligence the financial and political activities of all foreign and domestic enterprises with whom they engage in business. As a result, several corporations have been “black-listed,” and are unable to receive investments to grow their business. As a

¹²⁶Michael Peel, “Visions that contradict agriculture: Tradition challenged by the desire to promote exports,” in *Financial Times*, February 2, 2005.

¹²⁷Economic Intelligence Unit, “Senegal industry: Food, beverage and tobacco update,” February 2, 2005.

predominantly Muslim state, Senegal is at risk, should the government refuse to comply with any proposed economic and political strategy from the US. The fact that SONACOS is now majority owned by a Lebanese company could affect its ability to solicit and attract viable investors from abroad.

CHAPTER 5

PROPOSED REMEDIES AND DELINKING AS A FRAMEWORK FOR A NATIONAL DEVELOPMENT STRATEGY

Since the establishment of the Bretton Woods Institutions and the era of independence of former colonies, there have been countless attempts to explain and to remedy the aggravated economic conditions of peripheral countries of the world capitalist system. As described earlier in Chapter 2, from modernization theory to the Green Revolution, most of these attempts have retained the fundamental laws of motion of capitalist development as a framework for understanding growth and development in the context of the modern nation-state. In this chapter, I will describe the most recent initiatives to alleviate poverty in Senegal, as well as the most recent trends in the country's participation in the world capitalist system, namely its burgeoning IT services industry. Finally, I will present an alternative model based on Samir Amin's notion of *delinking*.

Poverty Reduction Strategy Paper

In 2002, the World Bank and the Senegalese government released the Poverty Reduction Strategy Paper (PRSP), which outlined a 12-year plan for economic growth. In the paper, the authors acknowledged the failure of structural adjustment plans in the 1980s, which was largely responsible for the contraction of the Senegalese economy in 1993, characterized by a declining GDP and rise in unemployment. To alleviate these symptoms, the government developed an "Emergency Plan." While these development efforts helped to achieve an average annual growth rate of 5% for the GDP from 1995 to 2001, this growth, in real terms, was only "a continuous reduction

of the deficits of the public finances and of the current account balance of payments while inflation was kept under control.”¹²⁸ Meanwhile, “the economic performance achieved did not contribute to improving the population’s living standards or to substantially reducing poverty.”¹²⁹ In other words, while economic development indicators signified progress, social development declined or at best, remained stagnant.

Evidence of decline was particularly strong in the health sector. According to the PRSP, “Poor individual and collective hygiene and environmental sanitation conditions together with food shortages are responsible for the deterioration of the population’s state of health.”¹³⁰ The authors also attribute the lack of employment opportunities to “the weakness of investment and the stagnation of agriculture and industry.”¹³¹ The report continues,

Notwithstanding the role that it plays in terms of employment, the primary sector contributes very modestly (18.5 percent in 2000) to GDP because of low agricultural productivity and climate changes. Consequently, agricultural production covers on average only 52 percent of the nation’s basic food needs. Investment in the agricultural sector is still concentrated in the areas where irrigated crops predominate, whereas poverty is more marked in the zones where rainfed agriculture is practiced.¹³²

While the authors attempt consciousness of the human elements of the economic decline, they fail to demonstrate the actual correlation between *poverty* and *hunger*. They seem to suggest that farmers are not producing *enough* crops, as opposed to examining what *kind* of crops they are cultivating. It seems that farmers in

¹²⁸Republic of Senegal, “Poverty Reduction Strategy Paper,” Dakar, Senegal, 2002, p. 6.

¹²⁹Republic of Senegal, PSRP, p. 6

¹³⁰Republic of Senegal, PSRP, p. 6

¹³¹Republic of Senegal, PSRP, p. 6

¹³²Republic of Senegal, PSRP, p. 6-7

areas where crops are irrigated experience shortages of food, while they simultaneously experience economic growth as a result of investment. Meanwhile, farmers in areas with enough rainfall to help cultivate crops for consumption may not experience the same kind of engagement in the national agriculture economy. That is to say, it would have been appropriate in this context to locate the specific areas of malnutrition, and attempt an explanation of that particular experience, rather than amalgamating the economic experience of farmers in distinctly different situations.

It comes as no surprise that the structural adjustment program, designed to help Senegal meet debt obligations while simultaneously encouraging economic and social development, failed. Ironically, the government struggled to meet the fiscal needs of the social infrastructure *because* of the reconfigured debt. Despite the onerous presence of the debt obligation, the authors aim to reduce poverty in half by 2015.¹³³ In essence, the PSRP is nothing more than a revised SAP. As I will demonstrate below, within the context of Amin's notion of *delinking*, it maintains the fundamental relationship of the center and periphery by failing to challenge the way in which Senegalese labor and output are valued. Moreover, the approach excludes realistic consideration of Senegal's ecological condition, which ultimately will determine the success or failure of agricultural activities. Unfortunately, PSRPs are appearing throughout the periphery, as a requirement for HIPC's to be considered for further assistance from Bretton Woods Institutions. Refusal to comply means indefinite isolation from the world capitalist system, as it threatens the inflated economic, political, and social ego of the center states. Today, this type of isolation is particularly dangerous for predominantly Muslim countries like Senegal, since the presence of Islam alone can qualify a nation for the global economic "black list."

¹³³Republic of Senegal, PSRP, p. 7

Growth of the Services Sector

While the Senegalese government worried about how to deal with the sudden decline in agricultural production in 2002, Abdoulaye Sarr was cutting the ribbon for his new outsourcing enterprise in Dakar, PCCI. Providing customer relationship management (CRM) services at 20 to 40% cheaper prices than European firms, PCCI now employs nearly 1500 young Senegalese professionals. In 2005, nearly 10,000 of France's 250,000 call center jobs were outsourced to former French colonies and protectorates, where employees are trained to imitate a French accent, usually Parisian, and often identify themselves with a French name, such as "Jean" or "Monique." In response to this, President Nicolas Sarkozy proposed a law requiring the operators to announce the location from which they are calling, but it was rejected by the national government.¹³⁴ Still, opposition to the rise of outsourced services in the periphery persists among middle-class professionals in the center.

The average salary for tele-operators in Senegal is US \$200 to US \$275 per month, which is five times the national average. If the industry succeeds, it could mean significant growth for the national economy, particularly for consumer spending. Also, if the majority of the ownership of these companies remains domestic, it could be an opportunity to retain the value of the labor within national economy. It has already improved the condition for the young educated urban population, who for years suffered the effects of a stagnant labor market.

However, it could also further alienate the rural economy from the urban economy. Since most agricultural production is reserved for exportation and staples are typically imported, it could signify an even more pronounced imbalance of trade. Despite actual increase in GDP, Senegal would still be classified as a poor country as

¹³⁴Nayan Chanda, "Don't Tell Anybody It's Africa Calling," *YaleGlobal Online* (October 4, 2005), <http://yaleglobal.yale.edu>.

long as there is significant disparity in income distribution (represented by a high Gini coefficient) and a significant trade deficit. To boot, US \$3.9 billion in external debt serves as an obstacle to economic growth and as a tool used by lenders to harness political, social, and economic control.

Delinking

In *Delinking: Towards a Polycentric World*, Samir Amin critiques the “liberal doctrine,” which claims that development occurs with market expansion through liberalization of trade and capital flows. The market and the state are responsible for creating the cultural and social conditions to allow this kind of liberalization. However, this model has several flaws in its application to the real world.

While it should include “all the output and all the factors of production,”¹³⁵ including goods, capital, and labor, it tends to only account for goods and capital. It also assumes that the market will “ensure the maximization of growth and an equitable distribution on the basis of full employment,”¹³⁶ but in the real world, the free movement of labor required to achieve full employment is sabotaged by political and social phenomena including racism, discriminatory immigration laws, and disparity in education. Finally, the liberal doctrine’s biggest fallacy is its tendency to accept its validity based solely on its performance in developed capitalist countries. There is little consideration of its ability to function in the periphery, and its failure is blamed on the alleged inadequacy or underdevelopment of the periphery. The liberal doctrine fails to recognize the center’s role in creating this kind of underdevelopment, and exploits the inefficiency of its operations within the periphery by undervaluing the labor and capital located there.

¹³⁵Samir Amin, *Delinking: Towards a Polycentric World*, p. x

¹³⁶Amin, *Delinking*, p. x

The key difference between a polycentric world and a capitalist world lies in the origin of the law of value. In a polycentric world, the law of value is based on its national and popular relevance. In other words, it

...ensures that the net output of the society (the value added or total output after deduction of productive consumptions), taken as equal to 100 (billions of monetary units), is shared between the rural and urban sectors in proportion to their input in quantity of labor (taken as equal to their proportion in the population, say 80 and 20).¹³⁷

Thus, the pricing of goods is linked directly to the value of the labor used to produce it. However, in the world capitalist law of value, prices are based on the dominant system of pricing, which are countries in the more developed center, where productivity is higher. In its application to underdeveloped regions, the formula skews the value of both urban and rural production, exacerbating the existing inequalities between the center and periphery and also magnifying the internal social inequalities.

Reflecting the proposal's Marxist roots, Amin identifies two underlying problems with the world capitalist system:

One, the labour force is treated as a commodity, full employment is not guaranteed by the state and the rural exodus is not controlled. Two, the economy, open to the exterior, looks to private capital and external public borrowing in the hope of easing the burden of a national savings effort. But the model shows that the hope is illusory since the reflux of profits and interest – proportional to the external capital accumulated – increases at a higher rate than the GDP.¹³⁸

Since the publication of *Delinking*, the latter phenomenon has become an even bigger challenge for peripheral countries. For Senegal alone, external debt between

¹³⁷ Amin, *Delinking*, p. 63

¹³⁸ Amin, *Delinking*, p. 66

1985 and 2004 increased by over 53% to more than US \$3.9 billion.¹³⁹ Its classification among the IMF's Heavily Indebted Poor Countries (HIPC) further demonstrates the world capitalist system's tendency to maintain and intensify the disparity between the center and the periphery.

Let's say that the Senegalese government adopted Amin's *delinking* strategy and created a series of policies that: 1) encouraged the development of the IT services sector, using the surplus of intellectual capital in the urban areas; 2) supported diversification of crops for sale and use in the domestic market; and 3) enforced systems of domestic taxation in order to fund more effective social institutions, such as schools and health clinics. These three initiatives, ideally, would help the nation achieve a trade surplus, in which it would be exporting more goods than it imports, and could potentially distribute wealth more evenly across the rural and urban populations. However, there are several obstacles. First, there is resistance from the French population to "sacrifice" jobs in IT services for the sake of the Senegalese economy and corporate cost-saving. Secondly, there is insufficient evidence that this market can grow at any significant rate, given the infrastructural challenges. Perhaps the biggest challenge of all is the ubiquitous debt obligation to Bretton Woods Institutions and to other donor countries, which have conveniently stipulated in the conditions for assistance their right to determine the political and economic policies until the debt is settled. An attempt to implement an alternative development model – one that might actually work – could easily put Senegal and other peripheries, on the global economic "black-list."

What this illustration shows is that while delinking supports the implementation of more localized development strategies, it is not something that can

¹³⁹Derived from data from World Resource Institute EathTrends Searchable Database, [http://earthtrends.wri.org/searchable_db/index.php?theme=5]

happen peacefully without the cooperation of all of the interdependent parts. Capitalism has polarized the world, and the goal of delinking is to equilibrate the social, political, and economic conditions of the world system, and thus create a polycentric world. According to Amin, delinking is a concept that:

...has nothing to do with exclusion or autarkic withdrawal. It is a matter of subjecting the mutual relations between the various nations and regions of the whole of the planet to the varying imperatives of their own internal development and not the reverse. That is, a readiness to adjust to the worldwide expansion of capitalism. It is a plea in favour of 'reciprocal adjustment' (instead of unilateral adjustment, of the weakest to the strongest), and I regard it as the only possible realistic humanist discourse of our time.¹⁴⁰

What's more, delinking provides a space for understanding the usefulness of technology within its original context and the implications it could have when transferred to another.

Delinking does not imply rejection of all foreign technology, simply for being foreign, in the name of some culturalist nationalism. But it certainly does imply an awareness that technology is not neutral, either in terms of social relations of production, or in terms of models of living and consumption. Priority given to the involvement of the whole country, the entire people, in the process of change dictates a mix of modern technologies (possibly imported) and renovation and improvement of traditional technologies. By contrast the extraverted [dominant capitalist] option most definitely encourages total alienation in the technology of advanced capitalism.¹⁴¹

In a world where capitalism is using technology as a tool for conquest of new frontiers in our bodies, our food, and our water, delinking not only challenges the economic efficiency and sustainability of these activities, but also provides a

¹⁴⁰ Amin, *Delinking*, p. xii

¹⁴¹ Amin, *Delinking*, p. 67

foundation for a discussion on the ethical nature of these activities. While we have certainly, through years of scientific research, achieved the capacity to mass-produce and distribute genetically modified seeds, does the use of this technology benefit the user and the consumer in any significant and sustainable way? Since the world capitalist system assumes that what is right for the center is right for the periphery, it has failed to consider the implications of this technology on farmers in the periphery both ecologically and economically.

The ultimate problem is not the agricultural industry, and it is not the services industry. The problem is the systemic motivation of the world capitalist system to increase profits for private corporations in the center, while the social, political, and economic conditions of the peripheries deteriorate exponentially. There is certainly proof that losses ought to be restored to former colonies in the form of debt cancellation and other reparations, but the current legal and economic framework is not prepared to provide it. While the dynamic relationship between former colonies and former colonizers is unlikely to change in the near future, *delinking* provides a mechanism for equilibrating the social, economic, and political conditions of the interconnected parts of the world.

As we witness the effects of capitalist maturation on the African continent, this Wolof proverb becomes more relevant: *a stick in the water never becomes an alligator*. Peripheries exist in the capitalist system, but they are not of it and it is not of them. The future of their collective economic, social, and political health relies on their creativity, attention to the past, and proper valuation of present assets, like human capital, nature, and indigenous knowledge. With the help of progressive thinkers like Vandana Shiva and Samir Amin, perhaps countries in the peripheries can imagine for themselves and implement a viable post-capitalist model.

CHAPTER 6

CONCLUSION

More than forty years after independence from French colonial power, Senegal has found itself in a precarious environmental and economic condition. Although the IMF agreed to substantial debt relief in 2006, human development indicators remain alarmingly low. The IMF's current strategy entails an elaborate plan for poverty reduction and relies heavily on the growth of the agricultural sector. However, hundreds of years of colonial agriculture, characterized by increased monoculture practices, have taken its toll on the land and environment. The soil's salt content has become very high, and it is affecting the ability of farmers in rural areas to produce adequate crops to sell on the market and use. Moreover, industrial activities in other areas of the world have contributed to the shifting rain patterns across the Sahel, causing droughts and unreliable rainfall in the Senegambia regions since the 1970s.

One solution that has been proposed by development agencies, private companies, and some government agencies is the use of genetically modified seeds, which have "improved" traits, meant to increase the crops' chances of survival in the harsh environment. While this solution has some short-term benefits, there are long-term ramifications that ought to be considered. First, farmers are unable to use the subsequent generations of seeds when they purchase hybrid or modified seeds. Typically, with modified or hybrid seeds, crop yields decrease significantly over generations. The lack of adequate seed stores forces farmers to purchase seeds every year. In the event that the crop fails, the farmers are unable to pay debts associated with purchasing the seeds in the first place. There are no government subsidies available, and for aid, farmers rely mostly on private and/or foreign development

agencies. This situation is not unique to Senegal. In India, hundreds of farmers have committed suicide because of the overwhelming debt incurred by buying seeds from private companies.

The patenting and sale of seed varieties by private companies affects farmers all over the developing world. Traditionally, farmers developed varieties of plants that worked for the particular conditions of their land. However, economic growth strategies developed by institutions like the World Bank and IMF have compelled local farmers to use hybrid and other manufactured seeds produced by multinational biotechnology corporations. While there is no conclusive evidence that genetically modified seeds have negative effects on human health, there is no doubt that it has severe implications for the economies in which they are used. First, the intellectual property laws associated with the GM seeds prevent farmers from developing seed stores, which are used as capital for future planting cycles. GM and hybrid seeds decrease productivity over generations, as well. These conditions require farmers to purchase new seed every year. For farmers in areas where agricultural productivity is unpredictable, buying new seed is a risky and unsustainable requirement.

Microfinance programs are available for farmers to help them afford the costs of new seed and equipment every year, but these programs do not address the root causes of poverty and poor quality of life that many Senegalese people experience. These issues can be attributed to an economic system that has not changed much since colonialism, pushing Senegal to the periphery of the global economy and rural farmers even further to the margins. As long as thought leadership for development strategies is dominated by Western values, philosophies, and economic ambitions, these strategies will not reflect the real needs of rural farmers and other entrepreneurs in former colonies like Senegal. The dominant development ideology is laced with neo-liberal economic thinking, which also provides the fundamental justifications for

colonial expansion.

The experience of Senegalese farmers in the expansion of Capitalism encapsulates some of the fundamental traits of this economic system. In the Western mind, capitalism presupposes the existence of an innate desire for profit maximization. Until recently, its impact on the environment has been perceived as an externality. In its initial phase of expansion into Africa, Asia and the Americas, capitalism represented the ultimate clash in cultural differences, manifesting in physical, mental, and spiritual violence that continues to affect individuals and communities in former colonies who are still trying to find their place in this new expression of a global economy.

The most successful remedies for the challenges faced by Senegalese farmers are likely to come from the farmers themselves. For this study, I was not able to conduct extensive research on the grassroots movements for sustainability in Senegal, and this topic should be explored further. Whatever current movements exist would benefit from connecting and possibly collaborating with movements in other parts of the world. For example, Navdanya is an organization in India which focuses on seed, food, water, and land sovereignty for farmers and the working poor in India. The Beehive Collective, based in the United States, is a group of artists that produce anti-copyright images about economic and social issues confronting Latin America which can be used as educational and organizing tools. The Slow Food movement, in which the two organizations mentioned previously are engaged, is one example of a global community that could provide support and opportunities for people in Senegal who are organizing around the issues of food security and economic development.

In creating this post-capitalist or non-capitalist or alternative capitalist model for agricultural development in Senegal and other former colonies, there are many challenging questions to work out. How do you transfer power from large

corporations to farmers and other small entrepreneurs? How do you value nature, the products of nature, and the people who labor to produce food and other means for survival? How do you value the technology necessary to produce enough safe and healthy food for consumption and/or sale? What institutions need to be disbanded, transformed, or created to support such a model? How do you convince others to join? How do you engage urban dwellers in the process to create a more balanced growth strategy that is in touch with the cultural and philosophical foundations of society?

Such movements are happening at the local level all over the world, and in a sense, they should remain very local in order to maintain relevancy and effectiveness. However, each individual movement can gain from a collaborative space to exchange ideas and methods. Technology can be a major contributor to this movement by creating virtual spaces for this type of exchange as well as methods of communicating quickly and efficiently with each other and with future supporters. The Bandung Conference in 1955 might be a very interesting model for this movement. Representatives from Asian and African nations met to discuss their future after colonialism. At the meeting, they developed a list of principles that would guide diplomacy and legislation moving into independence. Over fifty years later, it may be time to reconvene to discuss new challenges, focusing on critical issues like food security, relevance of the Western development model, and opportunities to create alternative economic alliances to move former colonies inward from the periphery. It would serve as a first step to Samir Amin's vision of a polycentric world, in which many economic systems happen simultaneously and interact with each other, but preserve the social and cultural values within a society as well as the economic security of each member of society.

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