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**A GREEN REVOLUTION IN MOZAMBIQUE: A study about the Government
possibilities to launch a sustainable Green Revolution.**

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ABSTRACT

Andre Rodrigues. A Green Revolution in Mozambique: A study about the Government possibilities to launch a sustainable Green Revolution.

The present study is focused on the analysis of the political, economical and social factors that may interfere with the possibility of a Green Revolution as a solution for Mozambique to reach self-sufficiency and to reduce poverty. In order to perform such analysis, the study analyzes the consequences of the decolonization process in Mozambique focusing that the independence process in Mozambique did not create non-colonial models for the Agriculture Sector. Later on, the study tries to understand the impact of HIV/AIDS and Malaria on the labor force. By then, it explores the concepts of the Green Revolution and its successful history in India. At the end, it tries to evaluate if a Green Revolution is possible in Africa, especially in Mozambique, first identifying the factors, which characterized the Green Revolution in India, and trying to link those factors with the reality of Mozambique.

The report is structured as followed; Chapter 2, “The decolonization process and its impacts on the agriculture sector“. It gives information about the decolonization process, and explores its consequences. Chapter 3, “The Impacts of HIV/AIDS and Malaria on the Labor Force“. It analyzes the impact of those diseases in the labor force. Chapter 4 “The Green Revolution and the Agriculture Sector“, explores the concepts of Green Revolution, its success in India and its history in Mozambique. Chapter 5, finally, centers on conclusions, findings and recommendations.

André Rodrigues. Revolução Verde em Moçambique: Estudo sobre as possibilidades do Governo lançar uma Revolução Verde sustentável.

O estudo analisa os fatores políticos, econômicos e sociais que podem influenciar a possibilidade de uma Revolução Verde em Moçambique de modo a conseguir a auto-suficiência alimentícia e a conseqüente redução de pobreza. Para executar tal análise, o estudo examina as conseqüências do processo de descolonização, mostrando que o processo de independência em Moçambique não criou modelos não-coloniais no Setor de Agricultura. O estudo tenta, a seguir, entender o impacto de AIDS/HIV e da malária na força de trabalho. Logo após, ele explora os conceitos da Revolução Verde e a sua história próspera na Índia. No fim, ele tenta avaliar se uma Revolução Verde é viável na África, especialmente em Moçambique, identificando os fatores que caracterizaram a Revolução Verde na Índia e tentando ligar aqueles fatores à realidade de Moçambique.

O relatório é estruturado da seguinte forma: O capítulo 2, “O processo de descolonização e seus impactos no setor agrícola.”, dá informação sobre o processo de descolonização e explora as suas conseqüências. O capítulo 3, “Os impactos da AIDS/HIV e Malária na força de trabalho.”, analisa o impacto destas doenças na força de trabalho. O capítulo 4, “A Revolução Verde e o Setor de Agricultura”, explora os conceitos da Revolução Verde, o seu êxito na Índia e a sua história em Moçambique. O capítulo 5, formula as conclusões e recomendações.

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1. INTRODUCTION

1.1 Research Problem and its relevance.

Southern Africa is one of the poorest regions in the world. The global rise in food and oil prices has exacerbated the region's social and economic situation, causing increased malnutrition, degrading health indicators, and preventing economic growth. In the past, countries like Mexico and India launched a strategy to combat the scarcity of food they were facing. This strategy is called the Green Revolution. Like Mexico and India, the Southern African region could launch a Green Revolution in order to solve its problem of increasing food prices and growing food insecurity.

Political and economic factors that influenced the structure of public administration in the region may interfere with the implementation of a successful Green Revolution. The decolonization of the region is the most important political factor that may interfere the process. The independence process in Southern Africa did not create non-colonial models for public administration. Despite the independence processes that occurred in Southern Africa, the organization of public institutions remains modeled after colonial era institutions, which are no longer appropriate in their evolving contexts. Corruption is the economic factor related to the implementation of the Green Revolution. Contrary to widespread perception, corrupt practices extend well beyond financial misappropriation and include many forms of "abuse of power", such as cronyism, nepotism, sexual exploitation and coercion and intimidation of humanitarian staff or aid recipients for personal, social or political gain, manipulation of assessments, targeting and registration to favor particular groups and diversion of assistance to non-target groups.

The relevance of the present work is explained by the suggestions for the Mozambican Government to develop new strategies to adapt their Public Administration management, in order to strength the economic development originated from the

agricultural sector and decrease the food insecurity caused by the rising of the food prices.

1.2 Objectives and limitations.

The objective of this project is to explore the management strategy of the Government over the potential implementation of the Green Revolution in Southern Africa, specifically in Mozambique.

In order to achieve the objective, the research analyzed the consequences of the decolonization process in the region, the economic and social impact of HIV/AIDS and Malaria in the labor force.

After that, the research explored the concepts of the Green Revolution and its success in Mexico and India. At the end, by linking the successful of the Green Revolution in Mexico and India, the research identified the barriers and constraints within the current public administration structure to suggest alternatives and solutions that can encourage and contribute to a successful Green Revolution in Mozambique.

The present work is limited to explore how the Mozambican Government is dealing with the potential implementation of a Green Revolution in the country. It observed the decolonization process in the Region, the impact of HIV/AIDS and malaria on the economy of the region and the Green Revolution as one solution for the rising of food prices.

The study observes a general overview of the management strategy to implement a wealthy Green Revolution in Mozambique.

1.3 Methodology of study.

The research that was realized was exploratory and descriptive in terms according to its goals. The decolonization process and HIV/AIDS and Malaria are presented in descriptive form in order to understand the causes, their impact and consequences, on the Mozambican Public Administration.

The empirical part of the project intends to study available data relevant to the targeted problem and form observation about characteristics of the object, the Green Revolution in Mozambique.

The sources include government programs, published statements of politicians and agricultural authorities, NGOs and Foreign Agencies in Mozambique.

The project does not assume a specific pre-determined theoretical model, but is based on the set of assumptions about the nature of the object of research and the context of its development, which will be described in the course of the project.

The main research mechanism was bibliographical revision uniting information in different newspapers, databases, magazines, books, research centers publications and historical archives. Internet search was performed in order to follow the latest changes and decisions.

The documentary revision helped to base the research on the real legislative acts, laws, decrees and existing instructions. In order to avoid tendency on this research, on top of that I made few interviews with foreign and local authorities, in order to clarify different points of view and to give more credit to this research. In addition, the research will consider those interviews that were publicized in magazines, newspapers.

The data collection was done by individual research on Government institutions in Maputo, Mozambique, including USAID (United States Agency for International Development), CDC (Center for Disease and Control), UNDP (United Nations Development Programme), World Bank, IMF (International Monetary Fund), SADC (The Southern Africa Development Community), and several NGO's in the region.

2. DECOLONIZATION PROCESS AND ITS IMPACTS ON THE AGRICULTURE SECTOR

2.1 Socialism and Capitalism.

According to LIEBENOW (1986) "...Decolonization is taken to mean the process by which former colonies, or non-self-governing territories, become self-governing states."¹

In the 17th century, people in southern Africa felt the economic and political impact of a minority of Europeans. These Europeans set about taking over, and profiting from, other people's land. Farming and mining were the principle activities from which white settlers profited, with the Dutch, or Afrikaners as they became known, mainly interested in agriculture.

The Afrikaners had a huge social impact on southern Africa. Wherever they set up a community, they pursued a policy of racial segregation, based on a belief in the racial superiority of Europeans, wherever they set up. This reached its most organized form in the system of apartheid created by the National Party of South Africa from 1948 until the 1980's, when it began to be dismantled. While most of Africa had achieved independence by the early 1960s, it took much longer for Southern African colonies to become independent. Malawi, Botswana, Swaziland, Zambia and Lesotho all achieved independence by the end of the 1960s. In addition, Angola and Mozambique had to wait until 1975. Zimbabwe achieved majority rule in 1980. Namibia shook off South African domination in 1990.

Faced with global depression and political readjustments in the late 1980s, all states in Africa have been trying to implement major reforms. For socialist regimes, however, the demands have been the more daunting since these changes have often directly threatened the ideology (and the aspirations) of creating a more egalitarian social order in the wake of colonial rule. Their states faced fundamental social, economic, and ideological transformations, as well as political reconstruction; what was required was

¹ LIEBENOW, J. Gus. "African Politics: Crises and Challenges", Indiana University Press, 1986.

no less than the replacement of a socialist with a capitalist market economy, and corresponding alterations in property relations that involved enterprises such as peasant holdings, small family firms, and co-operatives, as well as large-scale farms, factories, and plants under state control. These reforms not only affected the lives of ordinary people, but also reshaped the power and privileges of the government, party leaders, and others directly dependent upon the state.

Such a move to capitalist markets in private relations and structural adjustment programmes (S.A.P.s) in the public sphere, however, were not shifts undertaken willingly in every case. Enormous pressures from powerful financial centers have been brought to bear on African governments since the 1970s, to encourage 'recovery programmes', to combat the ongoing economic crisis. Some countries - for example, Ghana and Zambia - now have more than ten years experience with S.A.P.s sponsored by the World Bank and the International Monetary Fund (I.M.F.). But the complexity of these transformations, affecting all segments of society through a dense network of interrelationships between political, socio-economic, and ideological factors, has often been overlooked in favor of simple slogans.

In this context, Mozambique figures prominently among those sub-Saharan countries seriously attempting to move to a more capitalist-oriented strategy of development. Independence was achieved in 1975, after a ten-year guerrilla war against Portuguese colonial rule, by the Frente de Libertacao de Mozambique (Frelimo), the present ruling party. As early as 1983 - long before the introduction of perestroika in the Soviet Union - the Government turned from large-scale, centrally-planned, capital-intensive, and import-dependent development projects both in industry and in agriculture, and placed an emphasis on more decentralized, capitalist-oriented, small-scale projects. It dismantled most state farms, redistributing land to peasants and private farmers, and withdrew from many economic spheres that it formerly dominated.

As in the rest of Africa, economic reforms preceded fundamental political changes. The new constitution that came into force in November 1990 can be regarded as one of the most democratic in the continent, not least because it provides, *inter alia*, for a wide

range of individual freedoms, including religion, association, assembly, and expression². Mozambique is no longer a one-party state and rival parties were allowed to contest the general elections scheduled tentatively for 1992.

Some of the country's economic and political reforms originated from domestic initiatives and debate - for example, investment in small-scale agriculture and industry, and encouragement of the private sector. But others, such as privatization of public services and market 'openness', have been instigated by international finance institutions, as well as by non-governmental organizations (N.G.O.s). To halt the deepening economic crisis fostered largely by South African de-stabilization, and to obtain desperately needed western foreign aid and credit, Mozambique joined the I.M.F. and the World Bank in 1984. Subsequently, in 1987, the Government adopted the I.M.F.-sponsored Programa de Reabilitacao Economica (P.R.E.), which represented a move away from the centralized socialist planning of the early 1980s towards a much greater reliance on market forces.

It is common to depict such a transition as one from socialism to the free-market economy. With the process underway in many African and Eastern European countries, scholarly inquiry has concentrated largely on macro-economic policies aimed at removing obstacles to 'properly operating markets'. The policy debate has centered on the effectiveness of externally-sponsored recovery programmes like S.A.P.s, and an assessment of their effects on social welfare. Some Africanists accept the officially generated reports of the World Bank and the I.M.F. that their programmes work. Although they admit that there will be real hardships, at least in the short-term, they are confident that these are worth the long-term gain. Others are skeptical of S.A.P.s but support them because there are few alternatives to these policies. They express concerns and reservations about the social consequences, as well as the implications of loss of state sovereignty. While remaining firmly committed to the need for structural adjustment, they recommend - as do studies by the United Nations Children's Fund

² 'Constitution of the Republic of Mozambique', in Mozambique Information Office, London, 1990.

(UNICEF) - that these programmes include 'adjustment with a human face' to ameliorate the worst social effects³.

Jonathan Barker has proposed a formulation that is worth building upon to examine the transformations underway, especially social and property relations in the countryside. His analysis of rural civil society provides a strong basis for scholars to be skeptical about the current craze with 'the market' as an all-encompassing solution to Africa's problems⁴. Studying the nature of market conditions can be useful, but Barker warns that an exclusive focus on imperfections - explained largely as a result of state intervention - creates serious distortions. He stresses, for instance, that structural adjustment requires restricting the involvement of governments in market activities, not their wholesale removal from any role in the economy. In Barker's 'triple alliance' model of international financial capital (World Bank and I.M.F.), private capital (foreign and domestic), and (progressive) small farmers, called for by S.A.P.s., the state is required for its repressive functions. To this, Henry Bernstein elaborates that the 'modernizing' African state will remain a critical force to contain the contradictions and conflicts - between regions or rural-urban divisions, as well as class, gender, or generational differences - that structural adjustment would exacerbate⁵.

An examination along these lines of the ongoing transformations and debates regarding the rural sector illustrates the significance of institutional changes. Barker's 'triple alliance', with its increasingly repressive characteristics, has rapidly asserted itself as Mozambique has turned towards a multiple-party political system. The externally determined aid conditions have seriously diminished the options open to Frelimo - or any successor regime - for self-determination. The retreat of the state has meant that western international financial institutions, aided by a variety of other agencies and

³ MAMDANI, Mahamood, "A Glimpse at African Studies, Made in the USA", in CODESRIA Bulletin, Dakar, 1990.

⁴ BARKER, Jonathan, "Rural Communities under Stress: peasant farmers and the state in Africa", Cambridge, 1989.

⁵ BERNSTEIN, Henry, "Agricultural "Modernization" and the Era of Structural Adjustment: observations on sub-Saharan Africa", in Journal of Peasant Studies, London, 1990.

organizations, have increasingly taken over the direction of the country's development. Mozambican private capital has remained dependent upon the resources made available by the World Bank, multinational enterprises, regional development banks, N.G.O.s, and so forth. South African capital, the key economic factor during the Portuguese era, has reasserted its dominance in Mozambique, as in the rest of Southern Africa⁶.

At the same time, the once unified Frelimo, now threatened by fragmentation and internal dissent, has not been capable of providing a consistent set of policies which could form the basis for a national development strategy. The leadership has disagreed on the pace and means for reaching its goal of a market economy, as well as the role of the central regime during the transition period. Its inability to end the 16-year-old war against the Resistencia Nacional Mocambicana (Renamo), coupled with the hardships of the economic recovery programme, have eroded the internal integrity of Frelimo. Since the mid 1980s, the party has ceased to be a unifying force, and ordinary Mozambicans have questioned its legitimacy.

Furthermore, Frelimo's reputation has been damaged by those who have acquired large farms and other economic wealth as a result of the Fifth Party Congress decision in 1989 to lift investment and accumulation restrictions on members. That this follows directly from I.M.F/P.R.E. policies indicates the contradictory character of the transition underway. Alternative parties hardly offer the prospect of a stable and democratic political order. This article reviews the nature of governmental changes, as well as the direction and character of the flow of funds under the new policies.

2.2 Mozambique's Rural Development Strategy

Prior to the Fourth Party Congress in 1983, Frelimo leaders adopted an ambitious socialist approach to development, with the state dominating all sectors of the economy. In rural Mozambique, this strategy was known as 'socializing the countryside'. It

⁶ CHAN, Stevan, "War and Consequences in Southern Africa", in Southern African Review of Books, London, 1991.

envisaged two main features: the organization of the dispersed peasantry into communal villages, where health, welfare, and education facilities would be available; and the collectivization of peasant agriculture to increase production.

Peasants were to be employed on mechanized state farms or to participate in semi-mechanized producer co-operatives. A rigid system of central planning, which had little relation to either the prevailing level or social organization of production, limited market forces. As for the decision to place the largest share of agricultural investment in state farms, this not only deprived peasant, private, and co-operative holdings of resources, but also restricted their access to markets for products and infrastructure. The results, moreover, were disappointing.

In 1981, the Ministry of Agriculture admitted that none of the state farms were profitable. Since then, several official explanations have been offered to account for such a dismal record of failure: excessively centralized management, inadequate technical and administrative skills, poor use of machinery, bad control of stocks, inexperience, and insufficient infrastructure. Recent academic work on Mozambique's collectivization strategy has emphasized social and political factors, in addition to technical constraints. Kenneth Hermele has argued that Frelimo broke sharply with those pre-independence policies in the liberated zones that had been relatively successful because of their compromises. After 1975, instead of sustaining realistic alliances with some of the progressive, traditional, local authorities and existing social classes, as well as with the market economy, Frelimo pursued a policy aimed at the total transformation of Mozambican rural society based on wage labor on collective farms. Using the agro-industrial site at Chokwe in the southern province of Gaza as a case-study, Hermele claims that peasant farmers were not prepared to be agricultural laborers on state-farm lands which they had originally occupied and then been expelled from, first by the

colonial regime and later by Frelimo. Hence, they resisted the process of collectivization efforts⁷.

Similarly, Christian Geffray describes how Frelimo's decision to exclude local traditional authorities from political power in the northern province of Nampula alienated significant sectors of the population⁸. The significance of this break with the past was emphasized by chiefs and others hostile to socialist policies. According to the analysis of both Hermele and Geffray, the leaders of Mozambique mistakenly believed that their agricultural development strategy precluded the necessity for sustaining class alliances and compromises.

Agricultural producer co-operatives suffered from many of the same labor, organizational, and technical problems as state farms. The effectiveness of the former was premised on two major misconceptions: that they would develop spontaneously through the grassroots mobilization of peasants, and that they would be rewarded by immediate increases in output. Neither of these assumptions materialized in practice. In addition, it was erroneously believed that it would be easy to make co-operatives more productive than family farms. Their focus on large-scale agriculture prevented the leaders of Frelimo from thinking through the problems of expanding small holdings as a major theme in their economic programme. Equally significant, the Government ignored specific conditions at the local level which impeded attempts to impose its strategy. In some areas, for example, peasant farmers had economic alternatives to what might be described as 'co-operativization', and thus bypassed state schemes.

For many reasons, from 1975 to 1983 Frelimo's policies proved inappropriate to the prevailing socio-economic conditions, and consequently failed to halt the decline which followed the collapse of the colonial economy. The reforms adopted by the Fourth Party

⁷ HERMELE, Kenneth, **"Lands Struggles and Social Differentiation in Southern Mozambique : a case study of Chokwe, Limpopo"**, Uppsala, 1988.

⁸ GEFFRAY, Christian, **"La Cause des armes au Mozambique"**, Paris, 1990.

Congress in 1983 were an attempt to correct earlier mistakes and shortcomings, and also heralded a new emphasis on more decentralized, capitalist-oriented, small-scale projects. In agriculture, the state sector was to be reduced and reorganized, with land distributed to peasants and private farmers. The Congress further instructed state institutions to provide much greater support to the co-operative, family, and private sectors.

In response to these decisions, the Government began to implement a series of reforms predicated on four main policy and institutional changes: regional prioritization, administrative decentralization, liberalization of commercial activity, and allocation of resources on the basis of economic pragmatism rather than ideology⁹. By turning to a more open-market strategy, Frelimo hoped to correct the economic imbalances that had resulted from past policy errors.

In the years following the Fourth Congress, South African destabilization campaigns undermined Frelimo's efforts to implement its land and agrarian reforms. Pretoria continued to support Renamo, in spite of the 1984 Nkomati Accord which required the governments of both South Africa and Mozambique to prevent their territories from being used as bases for attacks on the other. To arrest economic decline and to gain access to critical western foreign aid and credit, Mozambique joined the I.M.F. and World Bank in 1984, and three years later adopted its P.R.E. This contained the typical salient features of other I.M.F. austerity programmes, including the expansion of market forces, easy access to capital for the private sector, dramatic devaluations of the national currency, emphasis on fiscal responsibility, and cuts in the civil service, government subsidies, and social services.

The Fifth Party Congress in 1989 reaffirmed that priority would continue to be given to agriculture, particularly to peasant farmers and co-operatives, and that they should be supported by the establishment of specialized bodies at the district level. State farms remained important, but the Congress directives indicated that they were to be oriented

⁹ ROESCH, Otto, "Economic Reform in Mozambique: notes on stabilization, war, and class formation", in Taamuli (Dar es Salaam), 1989.

more towards production for export than to the supply of food for urban markets. Large private farms also were to concentrate mainly on export crops, as they had done during the colonial period¹⁰.

2.3 The Contemporary Struggle for Land

The current political and economic changes in Mozambique have not only restricted state intervention in the economy, but also incited intense competition over resources, especially land. Growing pressures from the private sector, as well as Frelimo's previous policies, cast doubt on whether the party will indeed give priority to peasant family and co-operative farming. The struggle for land has been taking place on two fronts: the peri-urban green zones surrounding the towns and cities, and the areas formerly controlled by large agro-industrial state enterprises.

Given soaring prices, elimination of nearly all food subsidies, and rampant unemployment, most urban families have realized the critical importance of being able to grow some basic crops and sell a small surplus on the market. The main problem has been that the majority do not have any access to land. In Maputo, for example, it was estimated that 75 per cent of all families lacked a small plot in 2005. It is true that in the peri-urban zones surrounding the capital there were about 250 co-operatives in 2005, with some 10,500 members, 95 per cent of whom were women. However, they have been complaining since the Government began implementing its economic recovery programme in 1987 about the repeated attempts being made by private farmers (who tend to be men), city officials, and others to steal their land. A growing number of party members and bureaucrats have aligned themselves against small-scale peasant farmers, particularly those in co-operatives, by alleging that they do not know how to make proper use of the land.

¹⁰ MARC, Wuyts “Peasants and Rural Economy in Mozambique”, Maputo, 1978.

The on-going P.R.E. measures have inevitably affected both the nature and work of peasant co-operatives. As explained by Sr. Soares Nhaca (Ministry of Agriculture):

“Productive activities must be evaluated according to economic and financial cost/benefit criteria. Cooperatives that did not operate on an economically rational basis were doomed to failure. Those cooperatives that refused to accept the General Union's economic advice are facing systematic losses, and their members are naturally demoralized”¹¹.

It is small wonder that the movement's leaders have challenged the notion that productive capacity should be the main criterion for the distribution of land, as well as the proposal to establish private ownership. Support has been forthcoming for the retention of the post-independence legal provisions whereby all land is state property, although titles for its use can be granted up to 50 years, and may be inherited. There has been unanimous opposition to foreign companies taking over any land worked by peasants. Sr Soares Nhaca also said:

“Big foreign companies may be able to produce much more than the peasants. But then what will become of us? These companies set their machines to work and they don't even need our labor. And they will produce things for export, not to feed the people”.

Another peasant grievance has been that although private farmers received tractors and trucks for agricultural work, they were not using them for this purpose. Many of the vehicles in question, sold largely to Frelimo 'veterans' identified by the U.S. Agency for International Development, have been carrying goods and passengers in the private sector. In general, indigenous capitalists, both in agriculture and industry, have become dependent upon the resources made available by external agencies. For them, privatization has meant an expansion of commercial and speculative activities for two main reasons: the war has made it difficult to establish long-term projects, especially in

¹¹ Interview with Exmo Sr. Soares Nhaca, Ministry of Agriculture, in May 12th 2009.

the rural areas; and profits have been higher, faster, and easier in transport and commerce than in agricultural or industrial production.

The struggle for land has also been fought in the countryside, where many have taken matters into their own hands in the absence of a clear strategy by the Government. The result has been illegal takeovers in recent years by Mozambicans from across the political spectrum, bringing chaos and confusion to rural areas. As much as 40 per cent of the new capital in foreign-controlled projects since 1985 has been in agriculture, despite the uncertain security situation.

2.4 Conclusion.

The Government's move to a capitalist-oriented market and a structural adjustment programme has led not only to macro-economic growth, at least in the short term, but also to more dependence on foreign aid, continuing political instability, and enormous hardships for the majority of the population. These changes have involved more than just the promotion of economic efficiency. With the retreat of the state, international finance institutions and western N.G.O.s have rapidly taken over the direction and content of economic and social policy. External dependency has limited the prospects of strong and autonomous national development, because this requires a leading role to be played by a state apparatus which must possess sufficient independence to be able to define and control the influence exerted by donor organizations and international banking institutions.

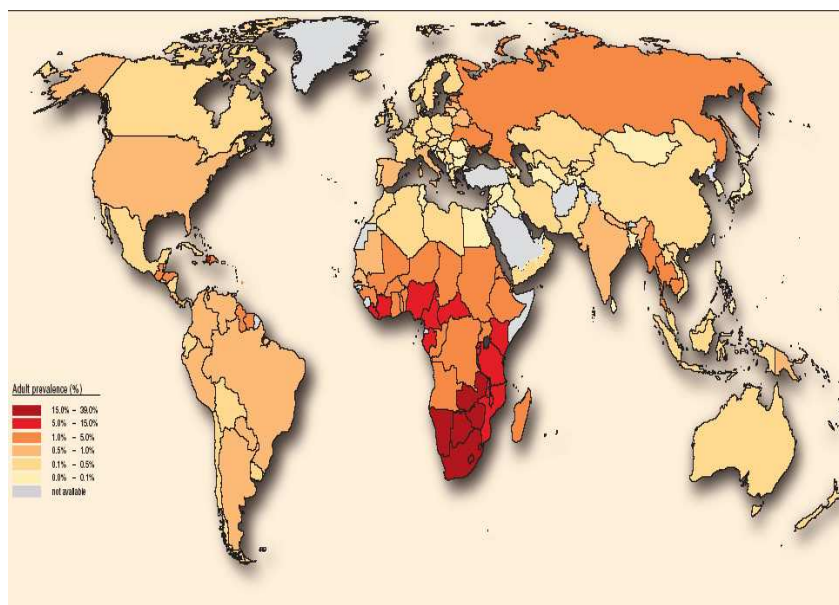
Certainly, external demands and aid conditions have been overwhelming. Yet to rely on a kind of dependency model to explain the situation ignores critical internal factors. There was room for domestic policy choices, if they did not conflict with the broad structural adjustment programme. Despite obvious constraints, state officials and party members had some latitude to make decisions on a range of policies. They could still decide, for example, how far and fast the move towards a capitalist-oriented market system should go, and how to address the growing inequality of recent years. They took

certain actions, but could have taken others. The basic problem in Mozambique has been that the socio-economic base of the state has been changed by the international donor community and by foreign private capital. At the same time, the dominant internal force is no longer the peasantry (as it was during the war of liberation) or the modernizing state bureaucracy (as during the subsequent phase of attempted socialist transformation), but the private sector, albeit dependent upon the resources made available by external forces: the World Bank/I.M.F., multinational enterprises, and N.G.O.s.

3. HIV/AIDS AND MALARIA

3.1 HIV/AIDS

The HIV/AIDS epidemic has become a serious health and development problem in many countries around the world. The Joint United Nations Programme on AIDS



(UNAIDS) estimates the number of HIV infections worldwide at about 42 million in 2008 and overall, 2.3 million died due to AIDS in 2008. Southern Africa bears a disproportionate share of the global burden of HIV: 35% of the HIV infections and 38% of AIDS deaths in 2008. In

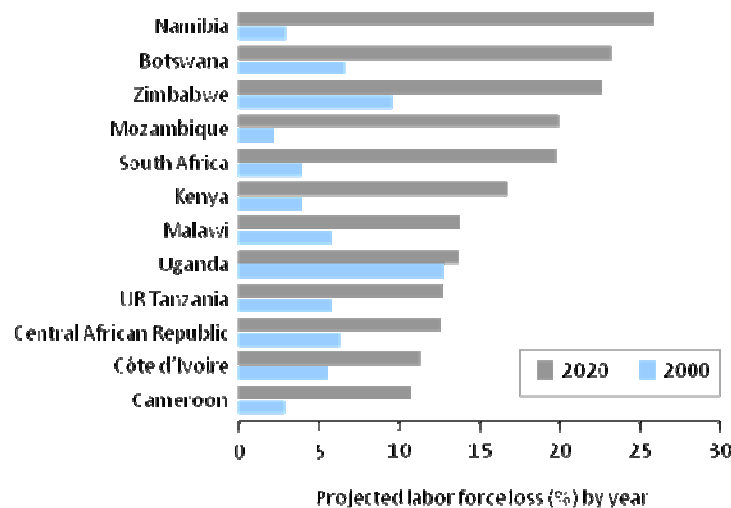
addition, the number of children younger than 15 years living with HIV is 2 million in 2008. Almost 90% live in Southern Africa.¹²

¹² UNAIDS. Status of the Global HIV/AIDS Epidemic. 2008.

The virus that causes AIDS has already infected and is infecting many Africans. About 20 percent of the entire adult population aged 15–49 is currently infected in nine southern African countries - Botswana, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Zambia, and Zimbabwe. This is a staggering level, and most of these people do not even know they are infected. From the beginning of the epidemic through 2000, about 4.4 million persons may have developed AIDS in southern Africa, although most of these have not been officially recorded. No cure is available for AIDS, and the disease threatens the social and economic well being of the countries.

The impacts of HIV/AIDS on poor rural populations are many and intertwined. The impacts can be felt most dramatically in entrenched poverty, food insecurity and malnutrition, in the reduction of the labor force, and in the loss of essential knowledge that is transmitted from generation to generation. And the impacts are felt disproportionately among women.

Projected reduction in African agricultural labor force due to HIV and AIDS by 2020



It is estimated that 42 million people in the world are infected with the HIV virus. Assuming that each HIV/AIDS case directly influences the lives of four other individuals,

at least 168 million people are likely to be affected by the epidemic. And approximately 95 percent of them live in developing countries.

What's more, these same consequences of HIV/AIDS - poverty, food insecurity, malnutrition, reduced labor force and loss of knowledge - contribute to making the rural poor more vulnerable to HIV/AIDS infection. This devastating cycle must be broken, and the agricultural sector has a critical role to play.

Poverty, which is widespread in rural areas, leads to poor nutrition and poor health, which make a person more vulnerable to HIV infection. Poor health can also shorten the incubation period of the virus, causing symptoms to appear sooner. This situation is especially severe for the rural poor, who have the least access to medical care.

Poverty also makes education and access to mass media and other sources of information more difficult. The poor are less able to equip themselves with the knowledge to prevent the risk of transmission. HIV/AIDS causes a sharp increase in poverty, especially rural poverty, as people sell productive assets to pay for health and funeral costs.

Poverty and mobility are critical dimensions of the HIV/AIDS epidemic. The main driving force behind rural migratory movements is poverty and the lack of livelihood opportunities in rural areas. Migrant workers who are away from home for extended periods of time are more likely to engage in unprotected casual or commercial sex, thus increasing their risk of exposure to HIV transmission.

HIV/AIDS takes its toll on food security in a number of ways. For example:

- HIV increases fatigue and decreases work productivity, which means less food on the table. In households coping with sick family members, food consumption generally decreases. As adults fall ill, families face increasing medical and health care costs, thus reducing the possibility for them to purchase the food that they can no longer produce.

- While the number of productive family members decline, the number of dependants grows, as households lose adults and take in orphans of dead relatives, further threatening household food security.

- Rural communities face a greater burden of care as many sick urban dwellers and migrant labors return to their village homes. As more household members die, families face declining productivity, loss of knowledge of indigenous farming methods and the continual depletion of assets¹³.

- Research in Mozambique showed that per capita food consumption in the poorest households decreased by 15 percent when an adult died. The same study showed that food insecurity and malnutrition were foremost among the immediate problems faced by female-headed, AIDS-affected households.

In addition to household food security, national food production is also affected by the loss of agricultural workers, especially in countries where agriculture forms a large part of the gross domestic product.

As HIV is predominantly a sexually transmitted disease, the largest number of people infected are those of reproductive age. Thus, the HIV epidemic not only reduces the total number of people, but the age and sex composition changes, with a population dominated by the elderly and the youth.

The reproductive age group is also the most productive. When a person is sick, the household not only has to manage without his or her labor contribution, but also with the loss of labor from those who have to care for the sick family member.

AIDS is characterized by recurrent periods of sickness, and consequently a recurrent loss of labor. This eventually erodes agricultural production and food security. Much of rural agricultural production is highly labor-dependent. In some agro-ecological zones, labor demands are concentrated in specific and critical periods of the year. In those

¹³ UNAIDS. Status of the Global HIV/AIDS Epidemic. 2008.

areas sickness or funeral attendance may mean that the planting season is missed, and with it a full crop.

The Food and Agriculture Organization of the United Nations (FAO) estimates that in the 25 hardest-hit countries in Africa, AIDS has killed around 7 million agricultural workers since 1985; it could kill 16 million more before 2020. The most affected African countries could lose up to 26 percent of their agricultural labor force within two decades. As agriculture still represents a large proportion of the gross domestic product, this loss in labor could have severe impacts on national economies¹⁴.

In many countries, AIDS is erasing decades of progress made in improving mortality conditions and extending life expectancies. The average life expectancy in sub-Saharan Africa is now 47 years, when it would have been 62 years without AIDS. In Mozambique, for example, life expectancy at birth has dropped to a level not seen in this country since 1950.

The agriculture sector plays an important role in influencing migratory patterns. For example, infrastructure projects may pave the way for increased agricultural production and marketing but may also encourage high levels of labor mobility and temporary migration. Those less mobile groups who remain in rural areas have to manage the impacts of the HIV epidemic with a dwindling resource base. At the same time, as an increasing number of HIV-infected urban dwellers return to their rural communities for care, survival strategies become stretched, food security threatened and poverty increases.

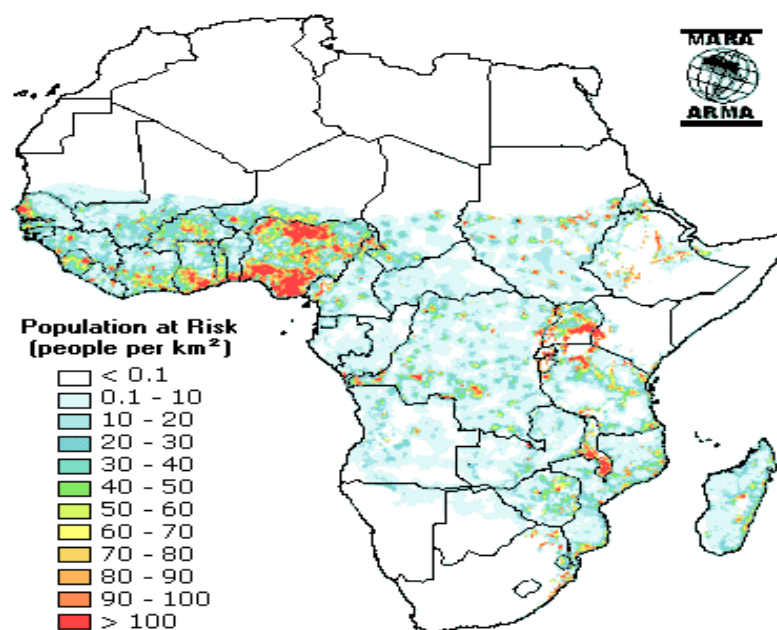
3.2 Malaria

Malaria kills over one million people each year, most of whom are children under 5, and almost 90% of whom live in Africa, south of the Sahara. Each year there are over 300 million clinical cases of malaria, which is five times as many as combined cases of TB,

¹⁴ FAO, database, available at : http://www.fao.org/sd/dim_pe1/pe1_060702_en.htm . Website visited on May April 25, 2009.

AIDS, measles and leprosy. Malaria is responsible for one out of every 4(four) childhood deaths in Africa¹⁵.

Risk of malaria infection has a profound effect on the mobility of human populations and the construction of new settlements, with consequent impact on economic growth and development. Although residents of highly endemic sites generally develop disease-modifying immunity that diminishes malaria-related morbidity and mortality, antigenic diversity may limit this effect geographically. Such acquired immunity, moreover, can be transient and is often lost within a year or so in the absence of reinfection, such as during a period of schooling or employment away from the malarious region. As in the case of migrants, the return of residents to their original endemic homes carries an increased risk of death or disease.



The importance of acquired adult immunity in protecting against malaria morbidity and mortality potentially inhibits the movement of labor between malarious and non-malarious regions. This represents an economic cost because human mobility permits

¹⁵ UNICEF, database, available at : http://www.unicef.org/health/index_malaria.html . Website visited on August 26, 2008.

labor to move to regions where it is most productive. By limiting such movement, malaria would interfere with skill matching and generally inhibit maximization of worker productivity. Furthermore, incentives to expand markets into malarious regions of the world will be lost in the event that trade and commercialization expose people to an increased burden of malaria, a factor that can hinder long-term economic development.

3.3 Conclusion

HIV/AIDS and malaria has serious economic impacts in Africa, slowing economic growth and development and perpetuating the vicious cycle of poverty. The impacts begin as soon as a member of the household starts to suffer from these diseases. Illness prevents the primary breadwinner from working, increases the amount of money the household spends on health care, and requires other household members to miss school or work in order to care for the patient. Death of the patient results in a permanent loss of income, either through lost wages and remittances, or through a decrease in agricultural labor supply. Households must also bear the costs of funerals and mourning, which in some settings are substantial. When children are withdrawn from school in order to save on educational expenses and increase the labor supply, the household suffers a severe loss of future earning potential.

4. The Green Revolution

4.1 Concepts

The term is used to describe the transformation of agriculture in many developing nations that led to significant increases in agricultural production between the 1940s and 1960s. The world's worst recorded food disaster occurred in 1943 in British-ruled India. Known as the Bengal Famine, an estimated 4 million people died of hunger that year in eastern India. Initially, this catastrophe was attributed to an acute shortfall in food production in the area¹⁶. However, Indian economist Amartya Sen has established

¹⁶ ARUNDHATI, Roy, "How Deep Shall we dig?", The Asiatic Society, 2004

that while food shortage was a contributor to the problem, a more potent factor was the result of hysteria related to World War II, which made food supply a low priority for the British rulers.

There were three basic elements in the method of the Green Revolution:

- Continuing expansion of farming areas;
- Double-cropping in the existing farmland;
- Using seeds with improved genetics.

The area of land under cultivation was being increased from 1947 itself. But this was not enough to meet the rising demand. Though other methods were required, the expansion of cultivable land also had to continue. So, the Green Revolution continued with this quantitative expansion of farmlands.

Double cropping was a primary feature of the Green Revolution. Instead of one crop season per year, the decision was made to have two crop seasons per year. The one-season-per-year practice was based on the fact that there is only one rainy season annually. Water for the second phase now came from huge irrigation projects. Dams were built and other simple irrigation techniques were also adopted.

Using seeds with superior genetics was the scientific aspect of the Green Revolution. The Indian Council for Agricultural Research (which was established by the British in 1929) was reorganized in 1965 and then again in 1973. It developed new strains of high yield variety seeds, mainly wheat and rice and also millet and corn.

The Green Revolution was a technology package comprising material components of improved high yielding varieties of two staple cereals (rice and wheat), irrigation or controlled water supply and improved moisture utilization, fertilizers, pesticides, and associated management.

In spite of this, India's agricultural output sometimes falls short of demand even today. India has failed to extend the concept of high yield value seeds to all crops or all regions. In terms of crops, it remains largely confined to food grains only, not to all kinds of agricultural produce.

The Green Revolution has created some problems mainly to adverse impacts on the environment. The increasing use of agrochemical-based pest and weed control in some crops has affected the surrounding environment as well as human health. Increase in the area under irrigation has led to rise in the salinity of the land. Although high yielding varieties had their plus points, it has led to significant genetic erosion.

Since the beginning of agriculture, people have been working to improving seed quality and variety. But the term 'Green Revolution' was coined in the 1960s after improved varieties of wheat dramatically increased yields in test plots in northwest Mexico. The reason why these 'modern varieties' produced more than traditional varieties was that they were more responsive to controlled irrigation and to petrochemical fertilizers. With a big boost from the international agricultural research centers created by the Rockefeller and Ford Foundations, the 'miracle' seeds quickly spread to Asia, and soon new strains of rice and corn were developed as well.

By the 1970s the new seeds, accompanied by chemical fertilizers, pesticides, and, for the most part, irrigation, had replaced the traditional farming practices of millions of farmers in developing countries. By the 1990s, almost 75% of the area under rice cultivation in Asia was growing these new varieties. The same was true for almost half of the wheat planted in Africa and more than half of that in Latin America and Asia, and more than 50% of the world's corn as well. Overall, a very large percentage of farmers in the developing world were using Green Revolution seeds, with the greatest use found in Asia, followed by Latin America.

4.2 The Green Revolution in India

For centuries agriculture in India has been characterized by subsistence farming, primitive techniques, and low yields. Most of the land was devoted to foodgrain production, yet deficits could not be eradicated and, in many areas, starvation and famines were frequent. As a result of excessive pressure of population on farms, unemployment was chronic, and millions of people moved to industrial areas and plantations. In recent years, however, the introduction of high-yielding variety of seeds has facilitated a significant breakthrough in foodgrain production, and India agriculture appears on the threshold of a great change. The latest development has earned the popular name “Green Revolution.” The long term effects of the Green Revolution were a turning point in stagnating Indian agriculture.

4.2.1 The High Yielding variety seed program

The major concern of a farmer in India is to produce enough food for the survival of his family. As a result, the cultivation of foodgrains is the dominant pattern of land use. About 75% of the cropped land is devoted to foodgrains (rice, wheat, millets, maize, barley and varieties of pulse). Rice, wheat, millets, maize and barley contribute approximately 70 to 90% of the total food requirements of the people at that time¹⁷. Foodgrain production can be increased by raising the acreages, the yields, or both. Labor, farming technique, fertilizers, and irrigation are represented by yield. Since cultivable land in India is limited and almost fully occupied, the main solution was must lie in raising the yield. An increase in yields will provide reserves for lean years and capital for investment. Raising the yield of foodgrains, therefore, appeared as a promising method of solving the food problem in India.

Efforts to raise yields of foodgrains in India by fertilization, irrigation, and improved seeds were not encouraging at the beginning. India’s traditional crop varieties had been evolved over several centuries in order to withstand droughts, floods, low soil fertility,

¹⁷ Special Report Series Nr 20, “Results of Diet Surveys in India, 1935-48.”, New Delhi, India, 1951.

and crude tillage practices without variations in yields. Imported varieties had failed where native seeds had enabled Indian farmers to survive, but native seeds had responded poorly to fertilizers and other inputs.

The High Yielding Variety Seed Program (HVP), launched by the Indian Government, in 1966, was the key element in starting India's Green Revolution. It includes five major foodgrains, rice, wheat, maize, jowar and bajra. The most important qualities of these hybrid crops were:

- They were more responsive to fertilizers;
- The yields per unit of fertilizers are higher;
- The heads do not topple when heavy with matured grains;
- Excepting paddy seeds, they are drought resistant and adapted to a wide latitudinal range;
- Their shorter growing period sometimes enables the cultivation of a second major crop; and
- They can give 2 to 4 times the yields of the indigenous varieties.

Their commercial adoption had been rapid and successful. During the 1966-1967 crop year only 4.66 million acres (2.2 % of the total area under paddy, wheat, maize, jowar, and bajra) were seeded under the HVP, but by 1968-1969 the area under the HVP had increased to 22.7 million acres (10.4% of the total cultivated area under the five cereals)¹⁸. The target at that time was 60 million acres, and the Government had taken extensive measures to supply seeds to meet this target, and had established the National Seeds Corporation to provide financing and guidance¹⁹.

¹⁸ Government of India, "A Reference Annual, 1968.", Ministry of Information and Broadcasting, 1968.

¹⁹ Cummings, R.W, "Seed Production in India.", New York, 1970.

The impact of the HVP was felt in the production of the major cereals. Between 1950-51 and 1969-70 total foodgrain production approximately doubled, from 50 million tons to 100 million tons, with a noticeable rise since 1966-67. Not all the new seed varieties were equally successful, but the dwarf Mexican wheat did very well; wheat production shot from 12 million tons in 1966-67 to 20 million in 1969-70, and the estimate for 1971-72 was 26 million tons²⁰

4.2.2 Adoption and Diffusion

Contrary to the common belief that farmers in India were conservative, most of them were willing to adopt new techniques under the HVP, but only if they had resources to invest in farming and security against crop failure.

The adoption of the HVP was facilitated by the “Intensive Agricultural District Programme” (IADP), which was built into the existing community development organization.

The major objectives of this program were:

A. To increase foodgrain production by demonstrating and promoting the adoption of improved farm practices;

B. To make available the needed facilities, credit, seeds, fertilizers, pesticides and implements.

Each farmer had been helped to develop a crop production plan for his land²¹. The success of the new high-yielding seeds in IADP districts had spurred rapid diffusion.

²⁰ **India News** (Ottawa, High Commission of India), September 8, 1971, and February 16, 1972.

²¹ **Malone, C.C., “Background of Indian Agriculture and India’s Intensive Agricultural Program”**, The Ford Foundation, 1969.

The HVP had spread over 18 % or more of the area under the 5 crops in the irrigated plains of Northwest India, but less than 10% of the foodgrain area elsewhere. The successful adoption of the HVP depended on judicious combination and use of chemical fertilizers, the application of pesticides, and an adequate supply of Irrigation water. Fertilizers, pesticides and irrigation required Capital Investment, and the farmer must produce a surplus in order to repay the capital he had borrowed, which required him to adopt commercial farming. As a result, the diffusion of the HVP is retarded in the agriculturally backward areas of India.

4.2.3 Fertilizer Consumption

The new cereal varieties are highly responsive to fertilization. The consumption of fertilizers increased to 1,196,700 metric tons in 1968-69 from 658,700 metric tons in 1966-67, and the consumption of phosphatic fertilizers increased from 194,700 metric tons in 1966-67 to 407,700 metric tons in 1968-69. Potassic fertilizers rose from 28,000 tons in 1961-62 to 176,000 tons in 1969-1970²². Despite the large increased in fertilizer consumption, India still used only about 20% of the World average per acre.

Fertilizer is not the only requirement for the HVP, and cash crops such as sugar cane and cotton also need large amounts. Many farmers in agriculturally backward areas can not afford to purchase chemical fertilizers, on top of that, distribution centers and credit facilities were inadequate all over India. In order to overcome this, the Central Government increased the number of retailers, including villages away from the railheads.

4.2.4 Use of Pesticides

HVP needs more effective disease and pest control than traditional varieties, because conditions which are conducive to the growth of the new varieties are also favorable for pests and diseases. Moreover, high-yielding varieties entail a higher cost of production,

²² JAMES, Boulware, H, "Brief on Indian Agriculture." American Embassy, 1970.

and justify more effective plant protection measures²³. The area covered by pest control measures increased from 5.9 million acres in 1955-56 to 98.9 million acres in 1968-69.

Increased use of pesticides in India had faced the same problems as increased fertilizer consumption, and the Central Government took steps to strengthen plant protection services and to expand training, credit and distribution facilities. 60% of India's current annual pesticide requirement is imported, but the Government approved most of proposals for domestic manufacture of the imported materials, spraying and dusting equipment.

4.2.5 Extension of Irrigation

Farmers under the HVP, can not afford to take chances with erratic rainfall. Moreover, the new seeds respond to fertilizer better if timely and adequate water is available, but 70% of the cropped area in India has rainfall too low or too unreliable to permit their use even during the main cropping season, and only 20% of the cultivated area is irrigated. Even where the annual rainfall is heavy, the available moisture is insufficient for crop production during winter and premonsoon seasons. The HVP had been adopted mainly in areas with well developed irrigation facilities. More of the previously favored grain producing areas had switched to the HVP, than the less-developed areas.

4.2.6 Conclusion

In brief, The Green Revolution stands for producing more food and other agricultural products from less land.

The key factor for the success of The Green Revolution in India was the Modernization of traditional agriculture and this calls for a new package of practices made so of the following:

- A. High-yielding varieties;
- B. Improved farm equipment;

²³ The three important measures practiced under the HVP are seed treatment, weed control, and post sowing prophylactic treatment.

- C. Substantial inputs of chemical fertilizers and insecticides,
- D. Supplies of water at specified intervals.

To complete the package, other essential items are also required:

- A. investment capital and production credit;
- B. Better research and extension services;
- C. Seed multiplication and processing;
- D. Stable prices and incentives, and
- E. The necessary institutional support for all these.

The combination of all these factors is generally equated with agricultural modernization. It would be idle to claim that all of the above or a good part of it was readily available immediately upon the advent of some of the forms of modernized technology. Nevertheless, enough had been known in India about what better seeds, water and fertilizer can do to herald the new technology as a rebuttal to the dire predictions of hunger stalking the Country.

4.3 Situation in Mozambique

4.3.1 Agricultural Production and Land Use

The majority of the population in Mozambique lives in rural areas and agricultural production is the main economic activity. Some 98.5% of rural households have agricultural land compared with 54.4% of urban areas ("urban" includes peri-urban areas). At a national level, 89.5% of households have a piece of land for agriculture and a mean area of 2.4 ha. The climate and soil are more favorable for agriculture in the north than in the south region²⁴.

The agricultural production is predominantly carried out by small-scale farmer or the "family sector" which is responsible for around 90% of total food production. More than 60% of the agricultural labor force is women.

²⁴ The Food and Agriculture Organization of the United Nations, "The Nutrition Country Profile", 2008.

Mozambique is now self-reliant in basic grains; maize importation has declined from 563.000 metric tons in 1992 to 14.000 metric tons in 2005. There are imports of wheat and rice, which are the more common staples in urban areas. Due to geographical and production characteristics of the country there is more comparative advantage to export the surplus from the northern region to Tanzania and Malawi rather than transport it to the southern region, as a result cereal is imported from South Africa and Zimbabwe to the deficit areas in the southern region.

The use of agricultural inputs is low. Only 4.2% of households have land partial or totally irrigated (urban households are more likely to use irrigation than rural ones), 9% use some equipment, 4.9% use animal traction, 2.1% use tractors, 1.8% use fertilizers or pesticides, and 13.2 % hire agricultural labor.

The main food crops are: maize, cassava, rice, sorghum, millet, sweet potato, beans, groundnuts. The main cash crops are: cashew, copra, cotton, fruit trees (citrus).

4.3.2 Production

During the agricultural season 2007-2008 the area under cultivation was estimated at 3.734.000 ha, from which 198.000 ha were lost. The total production was estimated at 1.480.000 tons of cereals, 261.000 tons of legumes and 5.362.000 tons of cassava.

Total cereal production increased significantly during the period 2004/05 to 2005/06, however during the season 2006/07 decreased slightly due to the floods that reached the Country.



Total legumes and cassava production follows the same pattern. For legumes total production increased from 129.000 tons (2004/05) to

335.591 tons (2005/06) and decreased to 257.027 tons (2006/07). The cassava production increased from 3.511.000 tons (2004/05) to 5.552.928 (2005/06), and decreased to 5.361.974 tons (2006/07).

4.3.3 Food Security

Estimates show that 64% of the Mozambican population (about 10 million) are food insecure. About 67% of the urban families do not have enough food compared to 63% of the rural families.

The lowest level of food insecurity is in the rural north (48%), compared to any other rural region or urban area in Mozambique. On the other hand the highest level of food insecurity is found in the southern region (75%), which corresponds with the higher level of poverty, lower agricultural potential.

Seventy eight percent of all food insecure households are found in rural areas. Forty percent of the total population live in the central region, more than twice the number in the north or the south. A total of 2.2 million of the food insecure are found in urban areas.

The more vulnerable groups for food insecurity are people displaced by the war and families with children under five. Surprisingly the female headed and the elderly households are not at greater risk of being food insecure.

In rural areas, people displaced by the war exhibit significantly higher levels of food insecurity than non-migrants (73% vs 62%) and somewhat higher levels of food insecurity in urban areas (71% vs 67%).

Due to the floods (Feb-2007), many families in the southern and central regions lost their farms, livestock, food stocks, agricultural inputs (seeds and tools) and other personal belongings.

According to the Ministry of Agriculture and Rural Development, around 215,000 ha of food crops (maize, cassava, beans, sweet potato, pumpkins, etc.) were lost; and 143,000 families were directly affected. Around 26 % of agricultural land was flooded. As a result of this situation many people became food insecure.

Therefore, droughts remain the predominant production risk. Another factor for food Insecurity is the isolation created by the difficult physical access to many areas in the country.

4.3.4 Country's Development Strategy

The country's development strategy is framed in the *Plano de Acção para Redução da Pobreza Absoluta II* for 2006-09, which aims at reducing the incidence of poverty from the current 54 per cent to 45 per cent in 2009. To achieve this target, the government is consolidating macroeconomic stability and undertaking a second wave of structural reforms, encompassing the public sector, fiscal policy, governance, and the business climate.

The implementation of a computerized integrated budget and treasury management system (e-SISTAFE) has contributed to improved public expenditure management. Revenue collection has increased moderately too. To boost revenue further, it will be necessary to broaden the tax base, especially in the extractive and informal sectors, and to strengthen tax administration. The government is committed to improving the transparency of special tax regimes for mega-projects and to reducing fiscal exemptions for new ones.

In line with the PARPA target, the government is increasing spending in priority areas (to 65 per cent of total expenditure) and undertaking huge infrastructure rehabilitation projects. This increase in spending will be comfortably financed by rising aid inflows and, to a lesser extent, by resources freed up by the Multilateral Debt Relief Initiative (MDRI).

Nevertheless, progress in other structural reforms has been slow. Despite the large reduction in the number of days needed to register a new company, deep-seated constraints to private-sector development remain, notably the weak judicial system. In addition, institutional and capacity bottlenecks lead to very poor performances in basic health services (HIV/AIDS antiretroviral therapy [ART] coverage), and in water (rural water supply and sanitation).

Better human resource management, more predictability of funds from the central government, and greater clarity in the processes of decentralized planning and budgeting should be key priorities in order to ensure the successful implementation of the PARPA²⁵.

4.3.5 Economic Developments

Mozambique has been one of the world's most rapidly growing economies over the past five years, with much of the impetus coming from reconstruction efforts and extensive foreign investment in projects based on natural resources.

²⁵ The Organization for Economic Co-Operation and Development - OECD, "African Economic Outlook 2007-2008", 2009.

In 2008, GDP increased by 6.2 per cent in real terms. This increase was led by industry, which expanded 7.8 per cent, mainly due to mining and electricity. The service sector followed, also growing strongly at 7.6 per cent.

Agriculture and fishing registered a modest growth rate of 1.6 per cent. Real GDP is estimated to have risen by 7.9 per cent in 2009, with 10.9 per cent growth in agriculture and strong performance (15 per cent) in the extractive industry.

In 2008, agriculture and fishing accounted for 20 per cent of GDP, but 78.5 per cent of total employment. While fishing benefited from a strong rebound, agricultural output suffered from a drought in some regions.

In 2008, abundant and regular rainfall and the timely provision of agricultural inputs contributed towards the best harvest over the last five years, triggering a strong recovery of agricultural production (6.5 per cent growth). It is estimated that cereal production reached 2.1 million tons (maize alone accounting for 1.5 million), which was 10 per cent higher than the previous season. Outputs of pulses and cassavas are estimated to have risen by 10 and 14 per cent, respectively. Notwithstanding this progress, the authorities assessed the domestic cereal deficit at 565 000 tons, mainly due to the lack of wheat and rice²⁶.

Assuming favorable weather conditions and the adequate provision of inputs and extension services, a 12.2 per cent increase in agricultural output is expected in 2009, led by rice and maize production.

4.3.6 Conclusions

In brief, the Green Revolution in Mozambique is far away to be launched. Unfortunately, the Mozambican Government is not making enough efforts to working on the early

²⁶ The Organization for Economic Co-Operation and Development, “**African Economic Outlook 2007-2008**”, 2009

stage of this project. As we saw on this research, Mozambique is not properly ready to host a sustainable Green Revolution.

Factors that diminish the possibility of a sustainable Green Revolution:

- Lack of a sustainable Agriculture Program;

The “*Plano de Acção para a Redução da Pobreza Absoluta*” is not focus only in Agriculture, instead, it is aimed on the rehabilitation of the Public Sector.

- Lack of Investments in the Sector;

In 2008, the Mozambican GDP increase 6.2 per cent in real terms. However the agriculture sector registered only a modest growth of 1.6 per cent. Remember that we are studying a Country where 90% of the population works on this sector.

- AID dependency;

Corruption, inflation, the erosion of social capital, the weakening of institutions, and the reduction of much-needed domestic investment. These are a few consequences of AID dependency.

5. Conclusion and Recommendations.

5.1 Considerations

The propose of this study was to analyze the possibility of lunch a Healthy Green Revolution in Mozambique. To do so, is mister to go through the Decolonization Process in Mozambique and its impacts on the Agricultural Sector of that Country. It is also important to address the social and economic impacts of HIV/Aids and Malaria on the rural labor force.

The study suggests a comparison between the actions of the Indian Government in order to support the Green Revolution in 1967 and what the Mozambican Government is doing and/or planning to support it now.

We can divide the comparison between these two Countries in two tables: The first one will show the Geographic and Social factors and the second the Economic factors:

Geographic/Social Factors	India	Mozambique
Fertile Soil	Yes	Yes
Whether Conditions	Good	Good
HIV/AIDS Malaria	Medium	High
Trained Labor Force	Yes	No
Water Supplies	Yes	Yes

Economic Factors	India	Mozambique
Strategic Plan	HVP	PARPA
Domestic Investmet	Yes	No
Production Credit	Yes	No
Stables Price	Yes	No
Tax Incentives	Yes	No
Subsidized products	Yes	No
Institutional Support	Yes	No
Access to Land	Yes	No

As we can see the Mozambican Government must start to act in order to host a Green Revolution. Investments in Equipment, Material and yields are the key to have progress

in this project. Moreover, partnership with local and foreign aid Agencies are important to develop strategies to help to stop the spread of HIV/Aids and Malaria.

5.2 Conclusion

The Green Revolution goes like this: the miracle seeds of the Green Revolution increase grain yields and therefore are a key to ending world hunger. Higher yields mean more income for poor farmers, helping them to climb out of poverty, and more food means less hunger. Dealing with the root causes of poverty that contribute to hunger takes a very long time and people are starving now. So we must do what we can in order to increase production. The Green Revolution buys the time Third World countries desperately need to deal with the underlying social causes of poverty and to cut birth rates. In any case, policy advisers behind the Green Revolution cannot tell a poor country to reform its economic and political system, but they can contribute invaluable expertise in food production.

Introducing any new agricultural technology into a social system stacked in favor of the rich and against the poor, without addressing the social questions of access to the technology's benefits will over time lead to an even greater concentration of the rewards from agriculture. So, the Government must have a Key role on this process. Investing on local farmers and by subsidizing products, can lead the economy to a boost on Agriculture matters.

One of the results of the Green Revolution was the social transformation of the farming communities. The Green Revolution activities necessarily demanded a lot of labor. They had now changed the traditional methods of work and traditional farming systems to modern production systems. The Green Revolution also in a way caused the land reforms, thus transforming completely the lives of the poor landless tenants who now could claim economic returns on operational (fixed land) leaseholds.

The most significant socio-economic constraint that remained unchanged by the Green Revolution forces was the rapid population growth. If the rate of population pressure on the land remains unchecked, the impact of the Green Revolution can easily be eroded away by high populations²⁷.

If all of this in mind, Mozambique must have a strong Political Strategy in order to launch a sustainable Green Revolution. They must take actions that can provide the right environment for foreign investors and have mechanisms to enforce the rules and regulations that will lead the Country into a possible self sufficiency in food.

India showed us that it is possible for a Country to launch a Green Revolution and Mozambique should learn from the India's experience and take actions that can promote progress and sustainable development for its Country.

5.3 Recommendations

In order to launch a healthy Green Revolution, the Mozambican government should take into consideration the following aspects²⁸:

1. Focus on food for the people: Guarantee enough healthy and culturally appropriate food for all persons, peoples and communities, and reject the proposal by which food is just a commodity for international trading.

²⁷ The Economic Commission for Africa – UNECA, database, available at: http://www.uneca.org/estnet/ecadocuments/Towards_aGreen_Revolution_in_Africa.doc . Website visited on May 29, 2009.

²⁸ Conference on the Green Revolution in Mozambique, database available at: <http://www.foodfirst.org/en/node/1781>. Website visited on May 29th, 2009.

2. Give the due value to food producers: Give value to food growers and support their proposals, respect the rights of men and women, rural workers and family farmers who grow and process food as a way of rejecting policies and actions that take away their value and threaten to eliminate their ways of life.

3. Establish local food systems: Create spaces for meetings among the producers and consumers of food, putting the ones who produce and the ones who consume in the center of all decision making related to food; Protect consumers against low quality foods, against inadequate food aid; avoid governmental structures, contracts and actions that promote unsustainable international trading that deliver power to international corporations without any responsibility for their actions.

4. Strengthen local control: Give control over land, pastures, water, seeds, and cattle to rural workers and local food producers, and respect their rights. They may use and share these resources in a social and ecologically sustainable manner; avoid privatization of natural resources through laws, commercial contracts and private property regulations that lead to their concentration in the hands of a minority.

5. Develop local knowledge: Strategies must be based on local producers knowledge and their organizations that conserve, develop and manage local production and harvesting systems, developing appropriate research systems which knowledge can be transmitted to future generations, and reject technologies that suffocate, threaten and contaminate biodiversity.

6. Work with nature: Take advantage of the diverse attributes of nature with methods of agro ecological production and harvesting that maximize the ecosystem and improve the ability to adjust and adapt to climate change; avoid methods that risk the balance of the ecosystem such as monoculture with use of chemicals, pesticides and excessive irrigation.

By taking everything into considerations and adding the recommendations above, I strong recommend the Mozambican Government to follow these steps:

Step 1: Remodeling the Public System;

Mozambique must know that the Public Administration system built after the decolonization did not create the right environment to support their investments. Totally dependent on AID, Mozambique now cannot support growth. At the beginning, the Public Administration in Mozambique was built in an AID environment and because of that, it government is less interested in fostering entrepreneurs.

Step 2: Investments in the local farmers;

As India, Mozambique should give more support to its local farmers. By giving access to credit lines, subsidizing fertilizers and pesticides, lunching a Program for a fair distribution of land and joint decision-making among extension agents, farmers and researchers to develop locally acceptable farming practices and accelerate their adoption.

Step 3: HIV/AIDS and Malaria approach

Work together with foreign donors to develop new Strategies to prevent these diseases.

Step 4: Investment in Technology

The government should create a Committee to analyze the possibilities of investment in Agriculture technology. The Green Revolution needs a high technology in order to help farmers to produce higher valued products as a result of technological improvements in agricultural production and food processing systems.

Step 5: Partnership with big agricultural companies

Mozambique should look for partners on this sector. By bringing big companies to work with the small farmers, the production would be bigger with better quality; it would also create more jobs on this sector helping the eradication of poverty in the Country.

Step 6: Management of AID investment

The government must invest AID money in the Country. Nowadays, Mozambique is spending instead of investing this money. AID money leads to increased demand of local good and services as well as imported goods and services. Unfortunately, Mozambique is border with South Africa, where the prices is far way below the Mozambican market. With the increase of importation, domestic policymakers must raise interest rates and this is the problem. High inflation decreases the level of investment in the Country; less investment means fewer jobs; fewer jobs mean more poverty and more poverty means more AID money. The implement of a sustainable Political Strategy can be a solution for this problem.

To conclude, Mozambique has a great Agriculture potential, but this is not enough. The government should think strategically to reach each of these points listed before. If they do so, the Green Revolution is possible and the consequence are great and is not think too much in a probable self sufficiency in food and the eradication of poverty.

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