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**Structural Adjustment, and Natural Resources:  
An Overview of the Issues**

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**STRUCTURAL ADJUSTMENT, AND NATURAL RESOURCES:  
AN OVERVIEW OF THE ISSUES**

by

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## Abstract

This paper discusses the effects of World Bank structural adjustment programs on agriculture and natural resource use in Sub-Saharan Africa. The main thrust of these policy reform packages is to promote increased production of traded goods, many if not most of which are agricultural in origin. This implies a tendency toward increased intensification of agricultural production with consequent pressure on agricultural resources, particularly land. The paper concludes with recommendations to help ameliorate any adverse environmental effects of structural adjustment programs.

STRUCTURAL ADJUSTMENT, AGRICULTURE, AND  
NATURAL RESOURCES IN AFRICA

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I. Introduction

Any attempt to reach general conclusions regarding the effect of structural adjustment (SA) programs and the environment (or, in fact, anything else) must first recognize the heterogeneity of such programs. A recent World Bank compilation of measures implemented under the auspices of SA lending agreements<sup>1</sup> shows that virtually the entire economy and the full range of policy instruments can be included. By the same token, very few of these instruments or economic sectors are always included.

So, general prescriptions for improvement in the sensitivity to environmental concerns shown by SA programs cannot be based on a strict enumeration of policies which must be altered or eliminated but rather must focus on the overall aims of such programs. In this sphere there is in fact a unifying theme, that of opening economies to international markets and this, together with the structure of African economies gives rise to some useful generalizations and some particular recommendations for the future.

The next section will elaborate on the degree to which SA programs provide generalizable effects on natural resources in Africa, with particular emphasis on agriculture and the resource base needed to

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\*\* Comments from Aercio Cunha, and colleagues at Cornell University are gratefully acknowledged.

support it. Most important in any evaluation of agricultural resources is the soil and water used to produce crops. It is here that the most pervasive and the most important effects are to be found. The following section elaborates on the importance, cost and degree of irreversibility of effects on African soils and waters, together with some projections of current trends. The final section presents conclusions and recommendations for SA programs undertaken in the future.

## II. Common Aspects of SA Programs

A review of the policies common to SA (See Table 1) shows that devaluation of the currency together with removal of trade barriers are one of the sets of policies that most often constitutes a part of such programs. This fact points to the common theme uniting all such programs: to promote a country's comparative advantage by reorienting the economy outward toward world markets rather than inward toward protected domestic markets.

Comparative advantage states that a country will tend to produce those commodities which it can make relatively cheaply compared to its trading partners and will import those which it can make only at a relatively greater cost. This doctrine, well known since the time of David Ricardo in the early 19th century, provides the theoretical underpinnings for a policy of removing distortions (trade taxes, price controls, etc.) which prevent a country from following its comparative advantage.

Table 1. Overview of Adjustment Lending Policies in Selected Countries.

	Industrial Performance (1984-86)	Change in TOT against the country	Improve-ment in GDP growth <sup>1</sup> (1982-86)	Incre-mental private cons. <sup>2</sup> (1982-86)	MAJOR POLICIES			SECTOR POLICIES	
					Balance of payments reform	Fiscal reform	Financial reform	Agriculture <sup>4</sup>	Industry
Chile	Import pentra- tion expansion x	medium	medium	low	All QR elim. tariff reduced to uniform 10%; devaluation		Rescue financial inst.		Restructure to make it competitive
Colombia	x	medium	high	high	low exp. prom. & import ref; deval.	Major tax reform	Separate credit op. from phys. input supply		
Cote d'Ivoire	x	high	low	medium	strong trade ref.	Public enter-prise reform			
Ghana	x	low	high	high	trade ref. deval.	Increase in public spending	Rescue financial instit. raise interest rate	Reduce over-staffing	
Jamaica	x	high	medium	medium	strong trade ref; export prom; deval.	Major tax reform			
Kenya	x	high	medium	medium	low implement. cap.				
Korea	x	medium	high	low	5% QR & 20% tariff red.; exp. prom; devaluation				
Malawi		medium	medium	medium	deval.	Incr. excise & trade taxes			Emphasis needed on smallholder producer prices

Table 1. Overview of Adjustment Lending Policies in Selected Countries - continued.

	Industrial Performance (1984-86)	Change in TOT against the country	Improve-ment in GDP growth <sup>1</sup> (1982-86)	Incre-mental private cons. <sup>2</sup> (1982-86)	MAJOR POLICIES			SECTOR POLICIES	
					Balance of payments reform	Fiscal reform	Financial reform	Agriculture <sup>4</sup>	Industry
Mexico	x	high	low	medium	strong trade ref; exp. prom; deval.			Link farm p. to intern p. thru a p. band	Restructure to make it competitive
Morocco	x	high	high	high	Strong trade ref;	Incr. excise & trade taxes		Limit agencies power in the sector	
Pakistan	--NA--	low	high	medium	Remove QR on inputs; exp. prom; deval	Public inv. in infrastructure for private sector			
Philippines	--NA--	high	low	medium	Conflict with need to incr. rev. thru' higher custom duty	Incr. excise & trade taxes			
Thailand	x	high	low	medium	Reversed reduction of prot.: exp. prm; deval.; trade ref.	Incr. excise & trade taxes			
Turkey	--NA--	-----NA-----	-----NA-----	-----NA-----	20% QR and tariff protection; exp. prom; deval.	Public inv. in infrastructure for private sector			
Zambia	--NA--	-----NA-----	-----NA-----	-----NA-----	Reversed policy; deval.				

high indicates an increase in the growth rate and growth of more than 1 percent.

low indicates a decline in the growth rate and growth of less than 3 percent.

medium indicates a decline in growth rate but growth of more than 3 percent: or little growth despite an increase in the rate (less than 1 percent).

<sup>1</sup> Based on an improvement during 3 years after AL compared to 3 years before, and the level of GDP growth in 1982-86.

<sup>2</sup> Per capita growth

<sup>3</sup> Quantitative restrictions (QR) and tariff reduction with exchange rate depreciated and fiscal disequilibrium corrected. Result: Increase in export, volume at lower prices, lower imports (except Turkey and Pakistan).

<sup>4</sup> Phase out producer price control: reduce subsidies on inputs: improve services in the sector: reduce disincentives, e.g., overvalued exchange rate.

Source: World Bank.



The empirical case has been elaborated in great detail by Anne Krueger and associates in an exhaustive set of studies sponsored by the National Bureau of Economic Research.<sup>2</sup>

While there is still some debate as to whether the efficiency gains predicted by theory are truly the source of the superiority of outward oriented development strategies, the studies demonstrate that in fact such strategies can produce higher growth rates and higher rates of growth in employment at least in some countries.<sup>3</sup> This observation, most clearly demonstrated in the cases of East Asian export economies such as Korea and Taiwan, is reinforced by the impact of external shocks on African economies in the decade of the 1980's, where it seems clear that at least some degree of outward reorientation would be beneficial. This statement, however, falls far short of recommending immediate removal of all government interventions in trade and agriculture. Nevertheless, the extreme anti-export bias of macro policy in many SSA countries has clearly been excessive. However, it is important to realize that realignment of prices will not by itself generate the desired reorientation of economies in the African context. Various institutional and infrastructural problems must also be addressed.

The 1980's have witnessed a drying up of foreign capital flows for most developing nations together with higher real interest rates and generally adverse terms of trade shocks. These problems have provided an added incentive to promote the export expansion that outward oriented strategies emphasize, as foreign exchange shortages have become increasingly constraining.

The principal goal of the various policies designed to promote an outward oriented strategy is to achieve a devaluation of the "real exchange rate". The real exchange rate is defined as the relative prices of goods which are internationally traded and those which are produced and consumed only domestically. A devaluation implies an increase in the relative price of tradeables, both exports and imports. An increase in the price of exportables will tend to create an incentive to expand their production while an increase in the price of importables will create an incentive to decrease their consumption. Both of these effects work to increase the available supply of foreign exchange.

Given that African governments are reorienting (or being induced to do so) toward their "natural" comparative advantage via adjustments in the real exchange rate, the logical next question is to ask where their comparative advantage lies. First we must ask which sectors of the economy comprise the "traded" sector whose production is to be expanded. In Africa, traded goods are primarily agricultural (except for mineral exporters). In addition, agriculture is virtually always the most trade oriented sector of the economy, at least potentially, since the other obvious candidate, manufacturing, is unlikely to provide a substantial contribution to exports within the time frame envisioned by SA programs in Africa.

Another consideration supporting the conclusion that promoting tradeables means promoting agriculture is the fact that many versions of comparative advantage focus on relative abundances of the factors of production. In this respect Africa is, relatively speaking, well endowed with agricultural land and has low wages. The relatively low

cost of both of these factors compared to trading partners reinforces the designation of agriculture as the sector most likely to be stimulated by a depreciation of the real exchange rate.

It is important to emphasize that depreciating the real exchange rate is not by itself a strategy for agricultural development. Many non-price aspects of agriculture such as technology institutions, infrastructure and education must be taken into account and the need for them will vary not only according to the physical conditions of agricultural production, but also according to level of development. On both scores, Sub-Saharan Africa exhibits substantial diversity. Not only are agro-climatic zones very different from country to country, but common measures of the level of development such as per capita GNP vary by a factor of ten or twenty. "Getting prices right" may be good advice but it far from a fully articulated development strategy. The record for African economies in the 1980's demonstrates that growth is dependent on a variety of factors, not limited to those that can be addressed in medium term adjustment programs.

### III. Environmental Effects of Stimulating Agricultural Incentives

The previous section reached the conclusion that SA programs are in general intended to promote a faster pace of agricultural development and within agriculture, a higher level of production of export and import-substituting crops though it questioned the efficiency of the policy packages applied in SSA. What does this mean for the environment?

Before answering this question, it is important to recognize that agricultural development means changing the environment. Growth in agricultural production comes mainly from two sources:

- extension of the area under cultivation
- intensification of cultivation on areas already cropped

Both of these sources of growth necessarily imply changes in the environment in the sense that patterns of land and water use are changed (usually permanently) from what they were previously. Indeed, this process has been occurring since sedentary agriculture was first practiced millennia ago.

Two propositions related to this observation underlie the remainder of this paper: First, agricultural development and its consequent environmental changes are inevitable in the sense that no country can expect to achieve substantially higher levels of development without agricultural development as described above. Second, the process of agricultural development is desirable in spite of its environmental consequences since the alternative is to consign millions of Africans to a life of poverty and deprivation. The need for intensification becomes especially apparent when account is taken of the projected effects of population growth on the area of arable land per person. (See Table 2).

The pressure for increased intensity of land use becomes still stronger when the composition of growth is biased toward agricultural production. Increased prices for agricultural exports will, according

Table 2. Actual and Projected Per Capita Arable Land in Selected Countries.

Country	Year	
	1985	2000
	---hectare per person---	
Kenya	0.73	0.42
Malawi	0.48	0.30
Tanzania	2.30	1.44
Cameroon	3.34	2.09
Nigeria	0.71	0.48
Senegal	0.70	0.45

Source: World Bank.

to well known theorems of international trade, increase prices of factors used intensively in their production.<sup>4</sup> This implies that land prices will rise which, in turn, will draw more marginal land into production and require more intensive use of already cultivated land in order to generate an adequate return. This relationship between increased exports, land prices, and intensity of land use has been well documented in various studies.<sup>5</sup>

So, if we accept the inevitability and desirability of accelerated agricultural development together with its unavoidable changes in the environment, the case for environmental concerns due to SA must rest on the sustainability of the new land and water use patterns rather than the fact that they alter or destroy previous ecological patterns. This is not at all intended to suggest that we place no value on preservation of valued habitats. It is for precisely these concerns that national parks and preserves are created, and why the need to create such preserves is an important component of any study of the relationship between SA and natural resources. This discussion is directed at agriculturally valuable land which is devoted to crop production.

Sustainability is important in the most basic sense because it is important not to degrade assets which underlie the long run wealth and productivity of the country. Prime among these assets are soil and water which regenerate only very slowly, if at all (see below). However, even if maintenance of long term assets isn't held to be paramount, it makes little sense to undergo a painful restructuring process only to achieve a structure which can't be sustained and will