

**IMPACT OF STRUCTURAL ADJUSTMENT ON
SUSTAINABLE RURAL LIVELIHOODS:
A REVIEW OF THE LITERATURE**

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Summary

This paper reviews the impact of structural adjustment on sustainability of rural livelihoods. It unpacks the elements of adjustment and looks at the effects of each of these on the quantity, quality and sustainability of rural livelihoods. There is no systematic improvement or decline in rural livelihoods as a result of adjustment measures. Changes in the relative prices of tradables and nontradables provided incentives and had a positive impact on rural livelihoods in some countries but failed to create sustainable incentive structures in others. By concentrating almost exclusively on the issues of pricing, the reform policies ignored the other critical factors, in particular, the technological development needed to translate improved incentives into more sustainable and productive farming systems.

1 INTRODUCTION

This study reviews the literature on the impact of structural adjustment on the quantity, quality and sustainability of rural livelihoods in Sub-Saharan Africa (SSA). The aim is to assist in understanding the role of policy reforms in achieving sustainable and secure rural livelihoods. The study is concerned with three main questions. What are the main effects of adjustment measures on rural livelihood systems and their sustainability? To what extent have these policy measures been successful in helping poor rural households to build sustainable livelihoods? What are the implications for rural livelihood strategies?

The review starts by looking at the aims, contents and sequence of stabilisation and structural adjustment measures, together with methodological issues concerning assessment of adjustment impacts. This is followed by definitions of livelihoods and sustainability and an examination of the linkage between adjustment measures and livelihood systems and sustainability. Focusing on research findings, the paper reviews in more detail the impact of adjustment measures on key issues determining rural livelihoods and sustainability.

2 STABILISATION AND STRUCTURAL ADJUSTMENT

2.1 Rationale and Content

Structural adjustment is a set of measures that seek to permit renewed, or accelerated, economic development by correcting 'structural' disequilibrium in the foreign and public balances. Often, such measures are required as conditions for receiving World Bank and IMF loans. These reforms attempt to eliminate distortions such as an overvalued exchange rate, high fiscal deficits, restrictions on trade and inefficient public services that often prevent an efficient allocation of resources in the economy. The key objectives of the reform programmes are a reduction or elimination of balance-of-payments and public sector deficits; resumption of higher rates of economic growth; and the achievement of structural change to prevent future payments and stabilisation problems. Central to the programme is increased specialisation, both by the nation and within it, on the production of appropriate 'tradable' commodities - alongside the reduction of artificial stimuli to production of 'non-tradables', especially, but not only by the public sector. An important purpose of structural adjustment programmes is also to make the economy less vulnerable to future shocks by increasing flexibility and adaptability (Streeten 1989). The programme includes measures taken as part of both short-term stabilisation and longer-term adjustment.

In the literature, stabilisation is in principle distinguished from medium-term adjustment. The former is often associated with the IMF and concerned with measures aimed at improving macro-economic balance and stability. The main stabilisation instruments are designed to achieve reductions in aggregate demand usually through some or all of such measures as reducing public sector expenditure, raising taxes, and increasing interest rates. A common feature of a stabilisation programme is a combination of fiscal and monetary reforms, and currency devaluation in order to depreciate the real exchange rate - the relative price of internationally traded commodities vis-à-vis those produced and consumed domestically (Dornbusch and Helmers 1988). Stabilisation policies include exchange rate adjustment, credit ceilings, interest rate policy (i.e. positive real interest rates), tax measures, reductions in public expenditure, and a reform of price

policies (Green and Faber 1994). Because of its short-run perspective, stabilisation policies tend to rely more on demand management. Domestic monetary 'absorption' is normally contracted in the process.

Medium-term adjustment policies, on the other hand, aim to reorient the structure of the economy to encourage greater efficiency in resource allocation and investment. Adjustment, which is associated with the World Bank, is concerned with medium to longer term measures including trade and price liberalisation, and institutional and sectoral reforms. It aims to remove a wide range of distortions in product and factor markets.

The distinction between stabilisation and adjustment has, however, become blurred in practice. Normally, adjustment programmes supposed to be supported by the World Bank are not in fact implemented unless an IMF stabilisation programme is in place (Stewart 1993; Cornia 1991). More recently the two institutions have jointly undertaken reform programmes. For example, the Fund's 'Extended Financing Facility' often involves programme support traditionally associated with the Bank, while the Bank's 'Structural Adjustment Loans' include fiscal and other conditions traditionally associated with the Fund. Furthermore, many policy instruments used in stabilisation and adjustment are the same. For example, devaluation, interest rate reform and tax adjustments can all come under either of the two (Sahn 1994). In this paper, the term 'adjustment' is, therefore, used to refer policy reform initiatives associated with structural adjustment and stabilisation.

2.2 Sequence and Pace

Sequence and pace of adjustment policies are important factors that determine the success and sustainability of reform programmes. In the literature reforms are referred to as 'shock treatment' or 'gradual' reforms depending on the pace in which they are implemented. Two main arguments are put forward in favour of the shock treatment adjustment (Bhattacharya 1997; Greenaway and Morrissey 1993). First, in a highly distorted economy, gradual reforms can make the situation worse as improved efficiency in one market can increase the cost of the remaining distortions in others. Second, benefits may take longer if reforms are gradual, whereas rapid reforms would give strong signals to economic agents to respond to price changes quickly. Moreover, 'gradualism can create a period of very high uncertainty during which households and firms avoid fixed commitments' (Collier and Kidane-Mariam 1995: 8). One of the main arguments in favour of gradualism is that adjustment costs are likely to be lower if the reform process is introduced gradually. This is especially important for poor, immobile groups in backward regions, who may suffer severely if they are denied time to adjust. Furthermore, not all governments may be able to administer, or to maintain sufficient political consensus for, comprehensive reforms in a short period of time. Sequence and pace of reforms also depend on the severity and source of the initial macroeconomic imbalance. In hyper- or near-hyper-inflation, for example, small relative price shifts from adjustment would almost certainly be lost in the noise of overall price instability.

The results of sequencing lessons from adjustment experience are mixed. In most countries, adjustment has been implemented partially and gradually (Greenaway and Morrissey 1993) with sequencing of policies very different from that originally planned. Although there have been fewer problems at macro-level sequencing, which has generally conformed to expectations; sequencing of policies at the sectoral, market and micro-levels has usually been weak, limiting the effectiveness and sustainability of adjustment

programmes. Smith and Spooner (1990) argue that failure to understand the need for proper policy sequencing has contributed to the poor performance of adjustment in SSA. With the exception of Ghana where careful consideration was given *ex ante* to sequencing of policies, little attention has been paid to this issue in SSA.

Moreover, although some adjustment programmes have been sustained, elsewhere there have been slippages and, in some cases, a complete collapse of adjustment effort at an early stage of reform. For example, in Kenya and Tanzania, partial reforms and extremely poor sequencing have reduced the effectiveness of the adjustment programmes and in some cases have led to perverse and unintended consequences (Booth 1994; Richardson 1996). Kenya's policy reforms, in particular, which started relatively late and were implemented at a relatively slow pace, contrast with Ghana's adjustment experience. Ghana implemented comprehensive adjustment programme and undertook its reforms at an early stage.

2.3 Methodological Issues

There are methodological issues that need to be borne in mind in assessing the effects of adjustment. First, there is the counterfactual: what would have happened without adjustment? The 'before and after' approach which is used to assess the impact of reforms traces the path of economic performance before adjustment and then compares it with post-adjustment performance, attributing the difference to the effects of the adjustment programme. A major problem with this approach is that it is difficult to control for exogenous shocks. This simple before and after comparison cannot show that any element of adjustment - or the whole package - has 'succeeded' or 'failed' in changing some policy variable (e.g. in cutting balance of payment deficit or in reviving growth); such comparison fails to account for changes that would have occurred without adjustment. Perhaps some or even all of the adjustment effects would have happened anyway, and therefore cannot be attributed to policy reform. In the short run, because reforms are undertaken in near-crisis, when growth is faltering, adjustment gets wrongly blamed for the effects of slow or negative growth. In the medium run, adjustment is often followed by cyclical or regional recoveries independent of its own impact, and wrongly credited with effects of such recoveries.

The 'with' and 'without' method (which is also known as control group approach) involves comparing the performance of groups of adjusting and non-adjusting countries. The main problem with this method is also that there are variations in the actual adjustment packages and the reforms implemented by these countries (Gibbon 1996). Some of the adjusting countries may not have fully adhered to the conditions and implemented only part of the policies. Furthermore, different countries start from different positions. They face different conditionality, different sequencing of the reform process and so on. Differences in performance may also be due to factors other than the adjustment policies. Some of the non-adjusting countries have adopted parts of the policy reform programme without any agreement with the World Bank and the IMF, whereas others (e.g. Botswana) did not need a formal adjustment programme.

Second, there are strong background effects:

- In most African countries, population and workforce are growing at 2.5-3% per year. Except in parts of West Africa, land shortages and pressures have long begun to emerge.

- Urbanisation has severely exacerbated water shortages in semi-arid areas.
- In SSA one of the most important factor in determining changes in economic performance is weather. More than half of the total output is from rainfed agriculture which is heavily dependent on weather conditions.
- There is also the problem of widespread conflicts in SSA.

Structural adjustment may affect such ‘long-term trends’, but (as a rule) only modestly and slowly; and these long trends, not the impact of structural adjustment or its consequences, that are the main determinant of both numbers and sustainability of livelihoods. These long-term pressures - and technological or institutional adjustments, which may more than compensate for them in some instances (Boserup 1965; Mortimore 1993; Tuffin *et al.*, 1994) - probably have much more effect on the amount, quality and sustainability of rural livelihoods in the long term than the components of stabilisation or even liberalisation.

Third, the impacts of adjustment on sustainable livelihoods - or rather the impact of components of adjustment, which vary greatly between times and places - are of two quite different types: the impacts of measures taken during, and in the process of, structural adjustment, such as devaluation, interest-rate stabilisation, or deregulation of investment; and the impacts of macro-economic results of such measures, notably changes in the volumes, distribution and composition of income and output.

Although these problems make it difficult to isolate the effects of adjustment from other factors and to distinguish between short-term and long-term, direct and indirect effects, they ‘do not rule out the possibility of making causal statements concerning adjustment, albeit cautious ones’ (Gibbon 1996: 756). Keeping all these caveats in mind, the effect of adjustment measures can be measured by referring to the achievements of targets (Greenaway and Morrissey 1993). Whichever method is chosen, there will always be some degree of subjectivity. Although adjustment studies mainly use ‘before and after’ and control groups approaches (Mosley, Harrigan and Toye 1991; White 1996), most of the literature on the impact of adjustment on the rural sector in SSA are based on case studies looking at the performance of the sector under adjustment.

3 RURAL LIVELIHOODS AND SUSTAINABILITY

3.1 Rural Livelihoods

Livelihoods are the ways in which people satisfy their needs, or gain a living (Chambers and Conway 1992). A ‘livelihood’ is a set of flows of income, from hired employment, self-employment, remittances or (usually in developing rural areas) from a seasonally and annually variable combination of all these. A livelihood should be sufficient to avoid poverty, and preferably, increase **well-being** for a typical worker plus dependants. **Well-being** (Squire 1991: 178) ‘is the product of a range of factors, including adequate consumption of goods and services, health, status, achievement, and security.’ Livelihood implies systems of how rural people make a living and whether their livelihoods are secure or vulnerable over time.

Livelihood security means ‘secure ownership of, or access to, resources and income-generating activities, including reserves and assets to offset risk, ease shocks and meet contingencies’ (Chambers 1988: 1). Thus, it is livelihood security, rather than just food security, that is the focus of rural households because achievement of food security is just one of the objectives of livelihood security (Maxwell and Smith 1995).

A person or household has livelihood security only if there is a broad entitlement base that includes future claims and access to incomes, from private sources and/or from common property.

Livelihoods come from a variety of sources and activities, variable over time. They comprise several different activities for each given household - usually even for each working member, and even within a year. Flexibility of households' livelihoods determines the type of strategies that rural households adopt and how they respond to changes. Although some households adopt strategies that rely on few activities, most of them adopt strategies that are complex, diverse and versatile (Chambers 1989). As rural households derive their livelihoods from different sources, adjustment measures are expected to affect them in a variety of ways. Thus, we examine not only the outcomes, but also the institutional mechanisms by which adjustment measures are translated into production and investment decisions by poor rural households.

3.2 Sustainability

Sustainability has emerged as one of the main criteria by which development is defined and evaluated (Lynam and Herdt 1992; Asian Development Bank 1991). However, using sustainability as an evaluation criterion requires a precise and unambiguous definition (Lynam and Herdt 1992). Livelihoods and ecosystems are considered **statically** sustainable if they persist over time, yielding a non-declining output, despite shocks and adverse conditions (Maxwell and Smith 1995). **Dynamically** sustainable systems also need to have the capability to increase productivity - at a 'satisfactory' rate given the likely growth of population - in a stable manner. Sustainability refers to the maintenance or enhancement of resource productivity on a long-term basis.

In ecological literature, sustainability is analysed in terms of sensitivity (the degree to which land system changes, following human interference) and resilience (the capacity of land to absorb change and to reproduce its capacity after interference). Based on the ecological concept of resilience, Conway (1985) defines sustainability as 'the ability of a system to maintain productivity in spite of a major disturbance, such as is caused by intensive stress or a large perturbation.' Livelihood systems display varying degrees of sensitivity and resilience, and their sustainability is determined by the outcome of these interactions, and of the changes imposed on them by human action and exogenous events (Maxwell and Smith 1995).

Early definitions of 'sustainability' were based on maintenance, or increase, of a fixed 'bank' of biologically renewable resources. From a historical perspective, there have been three stages of sustainability. First, it was a physical concept for a single resource - usually a biologically renewable resource. Second, came a physical concept for a group of resources (ecosystem). Third came a social-physical-economic concept: sustainability or capacity to support (human) life at a constant or rising level, even with a changing - or perhaps declining (alongside rising productivity) - mix of biophysical resources (Asian Development Bank 1991). But FAO (1990: 7) takes a broader view of sustainability, yet combines it with an older, conservationist and physical approach to the biophysical, resource based sustainability:

management and conservation of the natural resource base, and the orientation of technologies and institutional change in such a manner as to ensure the attainment and continued satisfaction

of human needs for present and future generations. Such sustainable development (in the agriculture, forestry and fisheries sectors) conserves land, water, plant and animal genetic resources, is environmentally non-degrading, technically appropriate, economically viable and socially acceptable.

These definitions embrace three basic and interdependent components of economic, social and environmental dimensions that constitute the foundation of sustainability (Reed 1992; Reed 1996). The **economic dimension** of sustainability requires that countries follow economic policies that generate sustainable increase in income, not short-term improvements that lead to long-term impoverishment. The **social dimension** of sustainability is based on the premise of social equity which means ensuring that all people have access to basic needs and the opportunity to make productive contributions to society. Long-term sustainability requires that resources must be shared in such a manner that everyone has access to a minimum standard of income, education, health, security and human rights. The **environmental dimension** of sustainability requires maintaining long-term productivity of the natural resources.

The economic dimension of sustainability corresponds to what the Asian Development Bank (1991), in a slightly different classification, calls capacity of a system for adequately increased productivity. The environmental dimension corresponds to ADB's rational use of natural and human resources to conserve and enhance the quality of the environment. To the social or equity dimension, ADB adds inter-generational equity. It also suggests a fourth, quality of life dimension of sustainability: avoidance of resources and amenity losses that (even if compatible with growing productivity and environmental enhancement) damage the quality of life.

Changes in economic structure, organisations and institutions - and possibly, the consequences of structural adjustment - can impinge on each of these elements. Livelihoods are flexible and comprise many diverse activities. Therefore, we should be concerned with the sustainability of current activity sets, or of adequate replacements, **not** necessarily with the sustainability of production - of a given output, or even of any output at all - on a particular piece of land or of physical capital

Given the fact that sustainability is a characteristic of a livelihood system's productivity and performance over time, it follows that the impact of policy reform should be measured by looking at how productivity of the system changes over time. Adjustment measures affect both inputs and outputs in agricultural systems with the aim of increasing production. But such changes may result in more intensive exploitation of resources and land degradation.

Trade and exchange-rate policies pursued in the past by Sub-Saharan countries probably contributed to lack of environmental sustainability in the development processes. These policies shifted the domestic terms of trade in a direction that weakened the sustainability of growth. In particular, African countries - at least well into the 1980s - manipulated prices, protection and exchange rates in ways which involved much more severe discrimination against agriculture than prevailed elsewhere in the developing world (Lipton 1987). This reduced incentives for producers to invest in conservation or appropriate tillage and cultural practices, because investments that ensure sustainability are largely driven by profitability. However, rapid correction

of anti-agricultural biases - especially if farmers are not confident that it will be sustained - can lead to incentives to over-farm fragile lands. So, while past policies discriminated against agriculture, that does not mean that removal of distortions will automatically lead to adoption of more sustainable farming systems. For example, moving to higher or positive real interest rates increases the rate of depletion of natural resources, since such a move will increase the extent to which investments with early benefits and distant costs are favoured, compared with investments that have delayed benefits and early costs.

Adjustment measures play a key role in determining livelihood sustainability - not only (though importantly) through their effect on pressures within and upon agriculture. It is not only changes in price incentives, but also changes in institutional arrangements that affect sustainability. For example, while liberalisation may improve cash incentives to farmers and reduce distortions associated with parastatals, the chosen forms of stabilisation - sometimes including rather indiscriminate cuts in public expenditures - can greatly reduce flows of agricultural research innovations. Agricultural experiments which often have long gestation periods are irretrievably disrupted by irregular funding. They have been slashed by some African governments during stabilisation. Yet agricultural innovations are vital to sustainability; unless yields rise, increasingly marginal areas must be cropped or overgrazed.

More generally, the interplay of incentives and institutional factors can produce different results depending on their combinations, outreach and timing - and on the intensity, diversity and resilience of agriculture. A flow of income to a household will be judged sustainable only if it does not involve net depreciation in the value of the set of all assets affected by the income-generating activity.

4 ADJUSTMENT AND AGRICULTURAL SUPPLY RESPONSE

Agricultural supply response is a critical factor in adjustment programmes. However, there has been considerable debate in the literature on the magnitude of farmers' response to price incentives. One source of such debate is the distinction between the supply response of individual crops and aggregate supply response. There is much evidence that output of individual crops in SSA is responsive to changes in relative prices as farmers shift land, labour or fertiliser between crops, but that aggregate supply response is much less responsive, especially in the absence of substantial intervention on nonprice factors (Bond 1983; Chhibber 1989; Jaeger 1992; Lipton 1987). Empirical evidence shows that the long run aggregate supply elasticity with respect to prices is in the range of 0.1-0.5 (Chhibber's 1989; Jaeger 1992). This suggests that a 10 per cent increase in agricultural prices produces 1 to 5 per cent increase in aggregate agricultural output. The estimates in African countries with inadequate infrastructure facilities - and usually with severely underdeveloped research - are higher than those reported in other studies. Binswanger's (1989) survey of estimates shows particularly low elasticities for SSA countries. The average short-run and long-run elasticities for SSA are in the range 0.18-0.21.

Studies have also found that agricultural outputs are more responsive to nonprice factors (Binswanger 1989; Chhibber 1989). For example, elasticities of output with respect to technology variables (e.g. irrigation) are found to be much higher than that with respect to relative, or overall agricultural, price changes. In developing countries with inadequate infrastructure facilities, imperfect markets, and lack of

capital and research organisations, the supply elasticity with respect to non-price variables is generally much higher than price elasticity (Chhibber 1989). Even in India, empirical studies have found irrigation elasticity to be 1.5 to 5.5 times the price elasticity (Krishna 1984). Chhibber (1989) also compared aggregate short- and long-run elasticities with respect to changes in agricultural terms of trade and irrigation, the non-price proxy variable. He found that in India (in the period 1954-5 to 1977-78) the elasticity of aggregate output with respect to non-price variables was three times the elasticity with respect to prices. These results of non-price elasticities are consistent with those of other countries that Binswanger (1989) surveyed.

The importance of other non-price factors is also highlighted by other studies. Diakosavvas (1989) who investigated the impact of changes in government expenditures on agricultural services and infrastructure on output for thirty-five developing countries in 1974-84, found that on average, a 10 per cent increase in government spending will result in approximately a 3 per cent rise in farm output. The implication of this is that, during adjustment, cuts in government expenditures on infrastructure and agricultural services may negate incentives provided by other measures (such as devaluation and price and trade liberalisations). Estimates for elasticity with respect to other factors show a relatively wide range: 0.30-0.75 for labour, 0.0-0.8 for land, 0.2 for rainfall and 0.1-0.3 for fertiliser (Cleaver and Donovan 1995). The effects of changes in the level of infrastructure tend to be higher in countries with poor infrastructure.

However, policy reform programmes have not devoted as much attention and effort to the development of agricultural technology, infrastructure and human capital as to policy reforms. In the era of adjustment the critical importance of nonprice factors has been overshadowed by a preoccupation with 'getting prices right' (Alexandratos 1995; Duncan and Howell 1992; Lipton 1987; Streeten 1989). While this imbalance is recognised in principle, the adjustment conditions remain heavily weighted towards price factors. Indeed, in some countries, expenditure on agricultural technology and rural infrastructure has fallen during adjustment (Richardson 1996; Tabor 1995). What the above results show is that agricultural terms of trade do matter, but expecting dramatic results from reform programmes without improvements in other aspects would be a mistake. Higher producer prices without action in other important areas such inputs, innovations, infrastructure, information, and institutions can be either ineffective, or even counterproductive (Streeten 1989).

Furthermore, risk aversion may well reduce producers' response to price incentives, particularly if these prices are felt by producers to be uncertain (Lipton 1987). This is particularly a problem in many SSA countries undertaking structural adjustment. Lack of market and price information and suspicion of the governments' willingness to pursue and sustain stringent reform policies does not help producers to make the necessary adjustments (and price expectations) to respond to price increases.

5 ADJUSTMENT, LIVELIHOODS AND SUSTAINABILITY ISSUES

To assess the impact of policy reform we need to look at how each of the main adjustment measures such as devaluation, price and trade liberalisation, cuts in public expenditure, interest rate adjustments and privatisation affects (i) the amount, rewards and quality of rural livelihoods; and (ii) the elements of sustainability (e.g. rational use of natural resources, increased and stabilised productivity, enhancement of

the quality of life). Although these are not the only measures in adjustment programmes, they are the most important policy instruments that affect directly or indirectly security and sustainability of rural livelihoods. One helpful approach is to distinguish between eight different effects of adjustment measures (see Table 1):

- The impact on the rate of return on household resources;
- The impact on access to and ownership of assets, inputs and services (e.g. land, water, credit, fertiliser, social services);
- The impact on employment;
- The impact on human capital (e.g. education, health, nutrition);
- The impact on agricultural research and technology;
- The impact on long-term stability and security;
- The impact on land (soil/terrain) and water use and hence sustainability (e.g. conservation or loss of soil nutrients); and
- The impact on biodiversity.

Table 1: Linkages Between Adjustment Measures and Sustainable Livelihoods

Adjustment Measures	Amount and Quality of Livelihoods				Sustainability Issues			
	Returns on Resources	Access to Assets and Services	Employment	Human Capital	Agricultural Research & Technology	Long-term Sustainability and Security	Land and Water Use	Biodiversity
1. Devaluation								
2. Price and Trade Liberalisation								
3. Cuts in Expenditure								
4. Privatisation								
5. Interest Rate Adjustment								

Linkages between adjustment measures and livelihood sustainability are indirect and complex. Apart from the problems of disentangling the effects of adjustment from those of other factors, the adjustment itself consists of a number of instruments, which have potentially different effects. Some elements of adjustment appear to contribute to livelihood sustainability, whilst others have negative effects. A typical adjustment programme consists of many different measures which do not necessarily have converging effects. For example, removal of subsidies and reduced expenditures on public services may have negative effects on the poor who may have to pay more for food and have access to fewer public services. Thus it is often difficult to judge what the net effect of a typical adjustment package is likely to be.

5.1 Adjustment and Rural Livelihoods

The section reviews the impact of the main adjustment measures on the quantity and quality of livelihoods. In particular, it looks at the effects of changes on outputs and incomes and how they affect rural livelihoods. Based on case studies from SSA, most of the literature (e.g. Commander 1989; Cromwell 1992b; Duncan and Howell 1992; Pearce 1992; Sahn 1994; Sahn and Sarris 1991) on the impact on the quality and quantity of livelihoods concentrates on changes in product and factor markets.

5.1.1 Returns on resources

Adjustment measures are expected to affect rural households' returns on land, as well as returns on labour and capital invested in own-holding production. The reallocation of resources during adjustment from non-tradables sector to tradables is expected to raise incomes in the tradables sectors. Whether the rural poor benefit from the adjustment measures depends to a large extent on whether they are net consumers or net producers of traded foods, whose prices are expected to increase. Changes in real wages induced by adjustment measures are also expected to affect the income of the rural poor. Thus the impact of adjustment on the poor depends on the share of tradables, nontradables and exportables in their income as well as in their expenditure and the movement in relative prices.

a) Impact of devaluation

Devaluation affects returns on rural households' resources by changing the value of both inputs and outputs. How it affects returns on household resources depends mainly on the relative increase in real farm-gate prices and input prices and whether it is accompanied by other measures such as trade and price liberalisation.

In several countries devaluation increased real producer prices (Centre for Development Research 1995; Claassen and Salin 1991; Kyle 1994; Sedogo and Michelsen 1995). In The Gambia, for example, devaluation together with the liberalisation of grain markets substantially increased the price of rice and coarse grain (McPherson 1995). The effect was higher farm income and a marked increase in the returns to labour. Between 1982-83 and 1988-89 returns to millet farmers increased by 20 per cent as a result of the policy reform. The changes helped reverse the fall in per capita income. Overall, there was a considerable improvement in the rural-urban terms of trade. In Mozambique, two large devaluations of 80 per cent and 50

per cent in 1987 resulted in substantially higher nominal and real producer prices (Kyle 1994). There was particularly a sharp rise in exports of smallholder crops as real prices of these crops relative to food crops suffered before 1987.

Steady devaluation and relaxation of price controls in Zambia in 1984 also increased agricultural prices by 13 to 42 per cent (Claassen and Salin 1991). As a result of higher producer prices, wheat production jumped from 4,400 tonnes in 1983/84 to 30,000, although this was partly due to good climatic conditions. Nevertheless, a significant increase in cultivated area was reported between 1980/81 and 1983/84. In Zimbabwe devaluation provided price incentives for tobacco producers as prices in 1990 reached twice the level of 1979-81 (Centre for Development Research 1995).

In Burkina Faso, devaluation of the exchange rate by 50 per cent provided a significant boost to the agricultural sector in 1994. Real producer prices for export crops increased. Although real fertiliser prices rose by 50 per cent, it has not affected its consumption which, in fact, increased by 60 per cent (Sedogo and Michelsen 1995). In Ghana devaluation raised the price paid to cocoa producers by 75 per cent between 1982/83 and 1988/89, despite a fall in world prices (Alderman 1994). But Younger (1992), who analysed the link between food price movement and changes to exchange rates in Ghana, found very small increase in food prices. The effect of 100 per cent devaluation was only an 8 per cent rise in food prices.

However, in other countries such as Madagascar, Malawi, Zimbabwe devaluation failed to increase real producer prices. For instance, Hewitt (1992) found that higher prices following devaluation did not provide adequate incentives for farmers in Madagascar to switch to production of tradables. Cromwell (1992b) also reported that rates of return on assets deteriorated in Malawi. Moreover, devaluation also had a negative distributional impact. While acreage of hybrid maize - which is considered to be men's crop - increased due to changes in the relative prices of maize and groundnut, cultivation of groundnut, which is women's cash crop, fell drastically (Due and Gladwin 1991).

b) Impact of liberalisation

Price and trade liberalisation measures are aimed at increasing agricultural producer prices and raising the relative prices of agricultural exports in particular. This is intended to raise income in the agricultural sector on which most rural households depend on for their livelihoods. In The Gambia, higher producer prices following liberalisation in 1986/87, and good weather, resulted in an increase of 46 per cent in groundnut production (Jabara 1990). But overall food production fell by 16 per cent as farmers reallocated land and labour from cereal to groundnut production as a result of higher groundnut prices, increased fertiliser prices and restricted credit availability. Nevertheless, between 1985/6 and 1986/87 real per capita income from groundnut production rose by 61 per cent. Real per capita income from all crops increased by 50 per cent between 1983/4 and 1986/87.

In Guinea, between 1984 and 1985, production and pricing were liberalised when state collective farms were abolished and producer prices were decontrolled. This resulted in a dramatic increase in the prices paid to farmers. In 1986, for example, the coffee producer price was nearly six times the official produces price in the previous year (Arulpragasam and Sahn 1994). As a result, between 1985 and 1986 official exports of

coffee increased forty-six-fold. Similarly, producer rice prices in 1986 and 1987 increased three to four times the official producer prices of two years earlier.

Baffes and Gautam (1996), who analysed the impact of liberalisation and devaluation measures on the producers of five major crops in Egypt, found that the measures had a positive net impact on the welfare of the producers of sugarcane, wheat, rice and maize, while they had a negative impact on cotton. In particular, they found that maize and sugarcane producers experienced the highest efficiency gains following the removal of market distortions. The positive impact on cereals shows that one cannot simply **assume** that adjustment favours export crops. The reverse will apply if the distortions, reduced during adjustment had (as in Egypt) been especially severe against food crops, and / or in favour of other crops.

In Zaire, price and marketing reform in the agricultural sector reversed declining farm-gate prices of maize, rice, cassava and groundnut. The effect of the liberalisation measure introduced in 1982 was substantially higher real producer prices for all four crops (Tshishimbi, Glick and Thorbecke 1994). The prices for rice and cassava were three times the level of 1981. These liberalisation measures, combined with devaluation in 1983, also increased real producer prices of export crops (i.e. coffee, cocoa, tea and palm nuts). However, this price liberalisation did not bring about any major increase in total output because in several regions the policy was not enforced.

In Cameroon, because devaluation was not part of the adjustment programme until 1994, economic reform had to take the form of deflation. In that context, price liberalisation meant significant reduction of producer prices to bring them into line with the world market prices. In one of the most decisive moves of the liberalisation measures, the government cut the producer prices for coffee and cotton by 60 and 32 per cent in 1989/90 (Blandford *et al.* 1994). This had significant adverse effects and hit the rural sector in the north hardest where cotton production constitutes the primary livelihood for many rural households (Blandford *et al.* 1994; Reed 1996).

In Malawi, nominal price increases for maize, tobacco and groundnuts in the 1980s have not kept pace with inflation. As a result the real producer prices for all three crops fell from 1982 through to 1987 (Sahn and Arulpragasam 1994). Similarly, a sharp increase in the export parity price of tobacco from 1985 was not matched with a corresponding rise in producer prices. The nominal protection coefficient (the ratio of domestic producer prices to international prices) fell from 0.89 to 0.24, thereby suggesting increasing implicit taxes on smallholders.

In Madagascar, price liberalisation started in the rice sector in 1982, with a 28 per cent increase in the official price of rice (Dorosh and Bernier 1994). Although this nominal price increase represented a three per cent fall in real terms, it at least slowed down the steady decline in real prices that had occurred since 1977. However, Sahn, Dorosh and Younger (1996) find that poor rural households, which make up 90 per cent of the country's poor, did not benefit from this adjustment measure.

In Mali, serious adjustment began in 1988 after earlier adjustment efforts in 1985-87 failed (Reed 1996). However, because devaluation could not be incorporated into CFA franc zone until 1994, the CFA franc became overvalued, leading to deteriorating terms of trade for the tradables sector.¹ Agriculture, which

¹ This is just the opposite of what adjustment was supposed to achieve.

provides a livelihood for over 80 per cent of the population, was adversely affected by a reform process which until 1994 had to rely on mainly on liberalisation without devaluation. Although producers of cotton, the principal export crop, were protected by a guaranteed market and access to credit, other producers (especially rice and wheat producers) had no such protection and had been seriously affected by cheap imports until 1994. However, devaluation of the CFA franc in 1994 improved the terms of trade for the tradables sector and redressed some of these problems, but its full impact on real producer prices is not yet known. An initial response to the devaluation was an increased export of livestock to neighbouring countries. In the Sikasso region, export of cattle doubled when the currency was devalued in 1994.

5.1.2 Access to assets, inputs and services

There is some evidence that some of the adjustment measures had negative impact on access to assets and claims via increased pressure on land availability, reduced access to inputs and services and changes in institutional arrangements. The introduction of water charges and cost recovery programmes in some areas also affected access to water resources. However, to the extent that adjustment measures have improved pricing of resources, they have reduced wasteful distribution and consumption. The main impact of adjustment on access to supplies in many Sub-Saharan countries relates to pricing and distribution of fertilisers, although its impact is reduced by the very low fertiliser usage by poor households (Duncan and Howell 1992).

a) Impact of devaluation

Partly as a result of currency devaluation the estate sector in Malawi has expanded in an already densely populated area at the expense of customary land availability, and has consequently reduced the access of the poor to productive assets (Cromwell 1992b). During the 1980s the number of estates increased from 1,200 covering an area of 300,000 hectares to 14,700 covering 843,000 hectares (Mkandawire, Jaffee and Bertioli cited in Sahn and Arulpagasam 1994). But most of these adverse effects of Malawi's extreme land inequality preceded adjustment. In general, extreme land inequality means that the 'pro-tradables' effects of adjustment will lead to an anti-poor distribution of rural gains, especially because there will be many net food buyers; but the blame lies with extreme inequality, not with price adjustment.

In Kenya, one of the major impacts of devaluation and price liberalisation has been increasing costs of imported inputs relative to output prices (Richardson 1996), due in substantial part to the prolonged and effective resistance of government to the liberalisation of maize prices and parastatal procurement. The overall effect of this has been deterioration in the agricultural terms of trade since 1990. Fertiliser use in 1992 fell to below the level in 1982 and there is very little evidence of a long-term move to more intensive use of key agricultural inputs.

In Ethiopia following a massive 142 per cent devaluation of the exchange rate in 1992, fertiliser prices increased by 39 per cent,² leading to a decline in fertiliser use from 156,000 tonnes in 1992 to 121,000 tonnes in 1993 (World Bank 1995).

b) Impact of liberalisation

Cromwell (1992b) reports that before market liberalisation in Malawi, over 60 per cent of rural households had adequate access to input and produce markets as there were permanent and seasonal markets evenly distributed throughout the country. After market liberalisation, 20 per cent of the markets shut down and large gaps in the marketing network developed as private traders failed to take over the role of the parastatal. In Tanzania, farmers' access to fertilisers has been limited by the dramatic increase of fertiliser prices following the removal of 80 per cent subsidy (Reed 1996). In countries such as Ghana and Kenya where data is available, the relative price of fertiliser has increased and its use has consequently fallen sharply. In Kenya, fertiliser consumption has particularly fallen because most extension services have not changed their recommendations, though they have become irrelevant, and are still giving the same advice as they did in the 1970s (Centre for Development Research (1995)).

In Senegal, liberalisation of state-controlled marketing in 1980 and the removal of input subsidies resulted in a collapse of fertiliser distribution in the groundnut basin (Gibbon 1992). From 1979/80 to 1985/86 a fall of up to 88 per cent was reported in national consumption of fertiliser (Lele, Christiansen and Kadiresan cited in Gibbon 1992).

The impact of liberalisation on the seed sector is also mixed. In some countries where there has been a good network of private traders and a well-functioning distribution mechanism such as Zimbabwe, seed sales have improved. But in others (e.g. Zambia) there has been a marked decline (Cromwell 1992a). This again underlines the role of strong, flexible institutions in determining the side-effects of adjustment.

5.1.3 Employment

Adjustment has far-reaching implications for the level and composition of employment as reallocation of human resources takes place due to shifts to the production of tradables. Although some non-tradables are labour-intensive, most tradables in developing countries - because they tend to have high ratios of labour to other resources - are relatively more labour-intensive (World Bank 1994a). We may, therefore, expect large farmers and those smallholders that hire labour, when they respond to increases in producer prices, to hire significantly more workers. However, Jamal (1995) argues that improvement of the rural sector's terms of trade would only lead to a rather limited reallocation of labour towards the agricultural sector. While it is true that a switch to the tradables sector would help workers in the formal sector, the informal sub-sector poor may be harmed, particularly if mobility between the sub-sectors is limited. Farmers' ability to switch from non-tradables to tradables may also be limited by the agroclimatic zones. Consequently the benefits of adjustment measures favouring certain crops may only be achieved in certain parts of a country, with

² This increase was announced after the government introduced a 15 per cent subsidy in an attempt to cushion the impact on fertiliser of a sudden and sharp rise in prices.

possible detrimental effects felt in other parts (Smith 1991). There might also be constraints (such as land availability) on the migration of workers from one area to another. The implication of this is that changes in the relative crop prices could lead to labour shortages in some areas, and a fall in demand for labour in others, leading to a geographically segmented agricultural labour market.

Smith (1991) also argues that the possibility of reverse migration under adjustment depends on the rights of access to land in rural areas and the existence of a well functioning labour market. But, increasing population pressure and changes in legislation in some cases are reducing the customary access to land. Agricultural labour markets are also poorly developed to absorb a large influx of migrants. Much also depends on how far the urban poor have retained their village links and whether they have any farming skills. Second or third generation urban immigrants may have very weak links with their rural kin, and may have no farming skills at all (Chhibber 1989). Thus, migration of urban poor to rural villages to take up farming may not be as easy as it sometimes appears to be (World Bank 1994b).

Nevertheless, there is some evidence of reverse migration. This is one of the findings of a large research project by Horton, Kanbur and Mazumdar (1994), which examined the effects of adjustment on the labour market in developing countries, including three case studies from Africa - Cote d'Ivoire, Ghana and Kenya. The study found migration of labour back into the agricultural sector. During adjustment the wage gaps between rural and urban sectors appear to have fallen in some SSA countries such as Ghana and Malawi, while they have increased in other countries such as Kenya and Zimbabwe (van der Geest and Wignaraja 1996). Pearce (1992) and the World Bank (1994b) agree that improved terms of trade between tradables and non-tradables faced by cocoa producers in Ghana have increased the demand for labour in cocoa-producing areas, but the impact was reduced by a shortage of land in these areas because if an area is 'dedicated' to a particular (tree) crop it takes a long time to replace, then price responsiveness depends on spare land and/or readily available improved technology.

Evidence from Ghana also shows that, in contrast to the pre-adjustment period, the minimum wage more than doubled in real terms between 1983 and 1988, while the daily wage in the informal sector increased three-fold (Pearce 1992). In The Gambia, the extent to which adjustment turned the rural-urban terms of trade in favour of the agricultural sector is shown by the groundnut/daily wage price ratio (i.e. the ratio of groundnut producer price to average daily earnings of workers) which more than doubled between 1978/9 and 1986/87 (Jabara 1990).

5.1.4 Human Capital

a) Impact of Cuts in Public Expenditure

The economic crisis preceding structural adjustment in most of Sub-Saharan Africa meant significant cuts in education and health budgets, with serious consequence on the quantity and quality of social service provision. Critics of adjustment claim that stabilisation programmes which focus on reducing government expenditures led to further cuts in the provision of social services. Although there have not been drastic reductions in the share of education and health sector expenditures, there is some evidence that the distribution of cuts within these sectors affected rural welfare. Thiesen (1994) argues that sustainability of

education and health services have been negatively affected by expenditure cuts during adjustment. In Ghana hospital attendances fell from 198,000 in 1979 to 117,000 in 1983, while child mortality increased from 21 per cent in 1970 to 25 per cent in 1985. Child malnutrition also rose from 30 per cent in 1970 to 50 per cent in 1985 (ibid). In Zimbabwe, reduced availability of health services and introduction of user charges have adversely affected the health of the poor household.

There is also some evidence of a deterioration in the nutritional situation in a number of countries undertaking macroeconomic adjustment. Using results of a survey on the nutritional status of pre-school children, Pinstrup-Andersen (1989: 90) concludes that 'adjustment policies either had negative effects or were unable to counter negative effects caused by other factors. In either case there is cause for concern.' In Nigeria, reforms have adversely affected access to health services and nutritional status through higher prices and cuts in the health budget.

Cuts in education have also led to a fall in the quantity and quality of education services. In some countries, adjustment programmes have introduced cost-recovery measures in the provision of social services to supplement central government recurrent expenditures. In Niger, for instance, new school charges in the rural areas were introduced during adjustment. This is expected to reduce school attendance, already lower than the average in the country (Coninck 1992). Introduction of payments for basic education or primary health care also increased inequalities by reducing poor people's access to these essential services (Centre for Development Research 1995). In Zimbabwe, user fees, which existed before adjustment both in rural and urban areas but not enforced, were increased and enforced to raise up to 8 per cent of total health service expenditures (Centre for Development Research 1995; Marquette 1997). In Uganda, about two-thirds of total health expenditure and up to three quarters of primary education expenditure are financed by users (Centre for Development Research 1995). There is some evidence that the introduction of user fees resulted in a fall in school attendance and postponement of treatments in health services in these countries (ibid). In Kenya, budget cuts and cost recovery measures in health and education have also affected the poor most severely.

5.2 Adjustment and Sustainability Issues

Although many studies have addressed the question of adjustment impact with comparative static changes, the issue of dynamic impact of adjustment has been largely neglected (Scobie 1989). It is possible that the immediate effects of adjustment on rural households may differ from the medium to long-run effects. For example, the impact of some adjustment measures may extend longer than the initial years during which they are implemented. Similarly, short-term stabilisation measures, which tend to be contractionary, inevitably delay any impact of adjustment in increasing output.

5.2.1 Long-term stability and security

Achieving a sustainable livelihood depends not just on increasing income, but also on reducing vulnerability to, and minimising fluctuations in, well-being, consumption and income in the long run (Davies 1997). Reducing risk is particularly crucial to rural households in agricultural dryland areas where access to water is uncertain. The success of adjustment measures in promoting sustainability therefore depends largely on

whether they reduce long-term vulnerability and increase stability and security of livelihoods. In order to achieve this, reform measures need to be sustained to produce lasting effects. For example, devaluation may increase real producer prices, but the exchange rate may soon become overvalued again unless it is realigned regularly. Devaluation may also be ineffective if it is not accompanied by other measures such as trade liberalisation and institutional reforms. The experience of adjustment in SSA countries shows that policy reform has not been particularly successful in creating long-term stability and security for rural livelihoods. In some countries, such as Sudan, as a result of high real exchange rate fluctuations and unstable export marketing following liberalisation, instability has increased significantly during adjustment (Elamin and El Mak 1997). Higher producer prices or benefits from such price increases in many SSA countries also proved to be temporary. There are several reasons for this.

First, there were inconsistencies in the implementation of the reform programmes. Many governments followed an on-again, off-again approach which often created uncertainties and instability in rural markets (Gibbon 1996; Jabara 1990; Richardson 1996; Sahn 1994). In many countries, the adjustment process has not only been very slow, but has also been subject to frequent policy reversals. In The Gambia, for example, groundnut prices were first raised significantly in 1985/86 and again in 1986/87 and then lowered twice in the following two years. There were also too many marketing reforms which added to the price uncertainty faced by farmers. In Malawi, conditions of the reforms were not adhered to, and liberalisation efforts were short-lived. Overall, these partial reforms and policy reversals undermined the **credibility** of economic reforms, and hence were costly in terms of their long-term sustainability.

Second, even where price reforms had momentum, institutional reforms were *ad hoc*, with no real coherence, leading to fragmentation of rural services, with no clear roles and responsibilities. This was the result of heavy cuts (during stabilisation), strong vested interests, and short time-horizons of governments requiring to sustain support. For instance, some of the parastatals were responsible for providing a range of services, including marketing and distribution of agricultural inputs and outputs, provision of credit, and extension services. After privatisation and scaling down of the activities of parastatals, large gaps appeared in the services provided by these institutions. Marketing reforms in Malawi and Kenya provide examples of the sort of problems that result from fragmentation of services (Cromwell 1992b; Richardson 1996).

Third, by focusing almost exclusively on price reforms, adjustment programmes have tended to ignore important institutional weaknesses that could be the binding constraint in achieving sustainable livelihoods. In Zaire, for example, price liberalisation failed to provide incentives to farmers because of poor infrastructure, particularly the transport system (Tshishimbi, Glick and Thorbecke 1994).

In areas where sustainable increase in crop output and income were achieved in the adjustment era, it was not solely as a result of adjustment measures. Instead, it was because of investments in yield-enhancing new technologies. In Kenya, for example, sustainable increase in crop yields was achieved because of improved land and water management systems in some districts (Richardson 1996). These improvements resulted from significant long-term investment and research in soil and water conservation techniques in these areas. However, many experiences in Asia and Africa confirm that improved technology spreads much faster, and with better results, if price repression of agriculture is reduced or removed, and price distortions within

agriculture are minimised. But price-based reforms, without an improved technology near the margin of profitability, will seldom induce a significant aggregate supply response.

5.2.2 *Agricultural research and technology*

The poor performance of agriculture is mainly explained not so much by lack of price incentive but by a lack of imaginative and appropriate agricultural technology and research (Lipton 1988). In SSA, despite well-intentioned initiatives such as the World Bank's SCAAP programme, agricultural research systems have seldom been centrally involved in the adjustment process. An exception is Burkina Faso, where the research institution was heavily involved in the design, implementation and monitoring of adjustment effects on agriculture (Tabor 1995).

The impact of adjustment measures on agricultural research can be direct, in the sense that they affect the operation of the institution, or indirect by changing demand for new technology (Tabor 1995). Indirectly, reform measures affect offtake of agricultural research, by altering the profitability of agriculture as a whole and of different types of farming activities. This affects the expected profitability of agricultural innovations, and the capacity of producers to adopt new technologies. If, for example, devaluation and liberalisation increase output prices, farmers may be encouraged to adopt new technologies or they may be more willing to diversify. Adjustment measures may also have a direct effect on the research institution. For instance, changes in government expenditure can have a direct effect on the operation of agricultural research system. Similarly, devaluation of the exchange rate raises the domestic cost of imported goods and services.

The literature on the impact of adjustment on agricultural research and technology is limited. Studies on the impact of adjustment measures on the agricultural sector have not explored the linkages between agricultural research and reform measures. One exception is Tabor (1995). This study focuses on the impact of adjustment measures using case studies from developing countries, including Ghana, Burkina Faso and East Africa. It analyses the impact of public expenditure cuts and devaluation and finds increased dependence of agricultural research systems on external funding during adjustment. Overall, donor funding as a proportion of total research budgets increased during adjustment. For example, in the 1980s Burkina Faso invested heavily in agricultural research and created large numbers of institutions but, following the implementation of the IMF-supported stabilisation programme, there were serious concerns about the long-term financial sustainability of the research system. Sedogo and Michelsen (1995) found that the research system suffered cutbacks in its budget during adjustment which made the research institutions more dependent on foreign aid for financing projects.

In Ghana, as agricultural research funding became heavily dependent on foreign aid, research activities that were not among the priorities of the donors were neglected (Tabor, Papafio and Haizel 1995). Cocoa and maize, for example, which account for less than 20 per cent of agricultural output, received up to 70 per cent of all research spending. Donor funding of cocoa research was linked to adjustment because it was expected that increased profitability of cocoa production would improve the adoption of new technologies. Similarly, in Kenya, environment-related institutions have become more dependent upon funding from

external donors after their budgets were cut in real terms (Richardson 1996). In Madagascar extension services were cut as a result of public expenditure cuts (Hewitt 1992).

Adjustment - the success of which depends partly on a flow of innovations permitting rapid farmer responses - poses dilemma for agricultural research. Big cuts during stabilisation are attractive to politicians, because the damage, while large, is deferred. Yet the alternative - greater reliance on foreign research funds, including experts - increases the difficulty of entrenching a sustainable, indigenously motivated research system.

A further problem faced by agricultural research organisations is the frequent policy changes adopted by governments during adjustment. These make it very difficult for them to set research priorities that reflect the changing economic realities and strategies. This is probably reflected by the lack of sustained technological progress as price incentives improved. During the policy reforms, the gap between farmers crop yields and those under on-farm research and extension trials remained as wide as ever (Tabor, Papafio and Haizel 1995). In several SSA countries, these problems were further complicated by the elimination of fertiliser subsidies, and reduced access to credit which delayed the adoption of input-intensive technologies, and as a result restricted the opportunity for structural change (Thiesen 1994). In other countries, adjustment programmes have increased instability and uncertainty which adversely affected the rate of adoption and diffusion of technology (Elamin and El Mak 1997).

5.2.3 Soil, water and land use

Before adjustment, soil degradation had already been a major problem facing most of SSA countries. In a recent study of soil capital depletion in 38 SSA countries, Stoorvogel and Smaling (cited in Holden and Shanmugaratnam 1995) report an average net nutrient loss per hectare of 20 kg N, 10 kg P₂O₅ and 20 kg K₂O. Ethiopia is cited as among those with highest nutrient depletion rates. However, under adjustment soil degradation has accelerated owing to depletion of soil nutrients.

Cromwell and Winpenny (1993) developed a methodology that can be used to analyse the linkages between structural adjustment and environmental change. Adjustment measures are linked to the environment via the impact on the spatial extent of cultivation, changes in the crop mix, and changes in the production technique. Where adjustment measures result in increased cultivation by bringing new land into use (or increasing intensity on marginal land), this can have negative environmental effects. Changes in product mix can also have different impact on the sustainable use of the natural resources because different crops and livestock make different demands on the land. The techniques used for cultivation and the intensity of cultivation (i.e. the extent to which land is cultivated continuously rather than left fallow) can also affect soil fertility.

Tchoungui *et al.* (1995) categorise the erosive powers of crops based on ground cover, soil fertility maintenance and soil structure cohesion, and cultivation practices associated with the crops. On the basis of this, they classify tobacco, maize, cotton and cassava as erosive crops. Higher prices for tradables are likely to stimulate tobacco and cotton production, to discourage cassava production, and to have mixed and locally specific effects on maize production. Such price changes also tend to stimulate planting of tree crops associated with both exports and reduced hill erosion - tea, coffee, oil palm, etc. A less favourable effect is

that, by encouraging specialisation, a more liberal price régime leads to reduced intercropping, rotation, and hence nutrient recycling.

There is some evidence that adjustment measures have encouraged extensive cultivation and reduced crop rotation and fallow periods in some areas (Cromwell and Winpenny 1993; Tchoungui *et al.* 1995). This is what adjustment measures are supposed to achieve: to provide incentives to producers to increase production. But how this increased output is achieved and whether it is environmentally sustainable is important. If higher producer prices encourage farmers to increase their output and cultivate more land, it means adjustment has provided incentive to rural producers.

A crucial factor is whether it is the **extractive** efficiency with which plants or animals use water and nutrients that is increased, the **conversion** efficiency, or the **partitioning** efficiency (as between usable and unusable plant or animal products) (Lipton and Longhurst 1989). Active agricultural research, focusing on conversion and partitioning efficiency and a labour-intensive expansion path, is a major determinant of whether adjustment increases sustainable agricultural livelihoods.

a) Impact of devaluation

In some areas the implication of increased producer prices was a bias towards extensive cultivation (Centre for Development Research 1995; Cromwell and Winpenny 1993; Tchoungui *et al.* 1995). In Cameroon, for example, as a result of higher producer prices, there was expansion of unsustainable cultivation on to marginal land. Intensive methods of cultivation were penalised by higher costs of inputs, lack of credit, and extension advisory support. In Malawi producers responded to price incentives by extending cultivation to marginal slopes in some areas. Increase in the area of groundnuts and pulses grown by smallholders in pure stand with negative implications for soil fertility was also reported in Malawi. Moreover, there has been a reduction in the proportion of land left fallow each year with a negative effect on the overall sustainability of the farming system. Data from Ghana and Kenya also shows a sharp fall in input use after devaluation encouraging extensive methods of cultivation. Conversely, in South Africa, steady reductions in maize subsidies have reduced pressure on marginal lands, which have reverted to grazing.

c) Impact of liberalisation

Price decontrol and increased costs of agricultural inputs in Kenya have prompted a switch from maize production to milk production which has further increased already excessive stocking rates with adverse effects on soil erosion (Richardson 1996). In general, however, a switch from maize to livestock production on marginal lands is environmentally desirable.

d) Impact of interest rate adjustment

As a result of positive real interest rates, the tobacco estates in Malawi responded by increasing the present rate of depletion, given the widespread use of fixed-term management contracts with stringent production targets (Cromwell and Winpenny 1993).

5.2.4 Biodiversity

Although it is very difficult to establish a clear and direct link between adjustment measures and changes in biodiversity, it is possible to assess the impact of land use changes on biodiversity. Evidence suggests that increased deforestation has been one of the main consequences of land-use changes brought about by higher interest-rates and a shift of price incentives towards tradables - typical components of adjustment. Problems associated with deforestation include loss of plant and animal habitat, the loss of species diversity, and soil erosion. Deforestation results from clearance for agriculture, and the felling of trees for fuelwood, and for exports.

a) Impact of devaluation

Richardson (1996) finds that as a result of devaluation there has been a switch to the production of high-value horticultural crops with mixed environmental impacts. In large-scale horticultural production where chemical inputs are used more intensively, there is a growing evidence that switching to horticulture causes water contamination and accumulation of chemicals in soils. However, in some areas the switch to high-value crops has provided an incentive for producers to increase investments in soil and water conservation.

b) Impact of liberalisation

In several countries liberalisation has led to increased deforestation. In Cameroon, Tchoungui *et al.* (1995) find that an increase in the price of commercial fuel as a result of reduced public subsidy, increased the use of fuelwood, leading to increased deforestation. This exacerbated the problem of deforestation where forest resources are lost at a rate of about 100,000 hectares per annum (Reed 1996). In Malawi higher imported fuel prices in the 1980s contributed the country to be more dependent on wood energy, thereby increasing deforestation which is already the second highest in SSA (Cromwell and Winpenny 1993). In Ghana there has been a major growth of logging since 1984 as a result of deregulation and increased price incentives (Gibbon 1992). The impact of this has been serious depletion of reserves and a high rate of deforestation. In Tanzania where wood felling accounts for 60 per cent of deforestation, liberalisation has led to a dramatic increase in timber export from 2,500 tonnes in 1986 to 33,000 tonnes in 1989 (Reed 1996). This is in marked contrast to Brazil, where distorted price incentives increased deforestation.

d) Impact of cuts in public expenditure

In Kenya, large cut-backs in the expenditure of the Forestry Department reduced the capacity of the organisation to manage the forestry sector to meet the requirements of an environmentally sound and efficient sector (Richardson 1996). Similarly, there has been a real reduction in maintenance and investment budgets of wildlife sector, with a consequent deterioration in the infrastructure supporting wildlife Parks and Reserves (*ibid*). These cut-backs caused a real reduction in salaries of sector employees which contributed to increased poaching and corruption by officials, threatened some of the wildlife populations such elephants and rhino. In Cameroon, redundant workers increased deforestation by cutting trees in forest reserves. In

Tanzania, public expenditure cuts seriously affected reforestation. From 1974 to 1990 its funding fell from 0.35 per cent of the overall government budget to only 0.05 per cent (Reed 1996).

6 ADJUSTMENT AND LIVELIHOOD STRATEGIES

6.1 Intensification

An important question concerning the sustainability impact of adjustment on rural livelihoods is whether it has encouraged agricultural intensification. Has it made intensification of agriculture more profitable to farmers by encouraging more intensive use of modern agricultural inputs? Has it encouraged the use of more input-intensive techniques? To the extent that adjustment encouraged use of modern inputs such as fertilisers, it can be argued that it has contributed to agricultural intensification.

Reform in agricultural input supply was part of adjustment programmes in most SSA countries. In many countries, the removal of fertiliser subsidy was an integral part of agricultural sector reforms, which affected the prices and use of fertilisers. Removal of fertiliser subsidies has reduced the consumption of fertilisers in some of these countries (Cleaver and Donovan 1995; Gibbon 1992; McPherson 1995; Richardson 1996). In Cameroon, Kenya, Mali, Mozambique, Sierra Leone and The Gambia, price liberalisation has not contributed to agricultural intensification. For example, in Kenya where the fertiliser reform policy was aimed at encouraging agricultural intensification, its consumption has almost halved. One of the main reasons was the increased cost of imported inputs (e.g. fertilisers, pesticides, machinery and farm tools), alongside a failure by the government to implement liberalisation that would have increased prices for crop outputs. In The Gambia as a result of higher fertiliser prices and a restricted credit system with more stringent requirements, fertiliser use fell sharply (Jabara 1990). From 1984 to 1987 overall fertiliser use dropped by more than 50 per cent. In Mali fertiliser use has fallen as inputs became relatively more expensive, but increased use of animal manure has been reported (Reed 1996). In Cameroon, significant cuts in producer price during adjustment together with removal of subsidy meant a sharp drop in fertiliser consumption (Blandford, Friedman, Lynch, Mukherjee and Sahn 1994).

There is very little evidence to show whether the decline in the consumption of fertiliser in these countries is more than a short-term response. In some countries, the decline is due to poor distribution and lack of availability, whereas in others it is because prices are relatively higher. However, the removal of fertiliser subsidy has increased use of fertiliser in several countries including Ghana, Guinea, Malawi and Tanzania (Cleaver and Donovan 1995). In Malawi, phased removal of fertiliser subsidy did not reduce fertiliser uptake even in the smallholder sector. In fact, it increased after the initiation of the fertiliser subsidy removal programme in 1983 (Sahn and Arulpragasam 1994) at an annual rate of 7.11 per cent from 1985, although the price of fertiliser relative to farm-gate prices increased. This apparent paradox is not even explained by the value-to-cost ratio (i.e. the ratio of incremental output per kilogramme of nutrient divided by its cost) which measures the incentive for increasing the application of fertiliser. This ratio has also been declining and since 1984/85 it has averaged 1.93 which is slightly below the level of 2.00-3.00 generally accepted as the ratio required to encourage producers to use fertiliser (Sahn and Arulpragasam 1994). Increased leakage to the estate sector (estimated to be from 25 to 30 per cent) as fertiliser subsidy was not completely

eliminated is one of the factors that contributed to the increased use of fertiliser (Sahn and Arulpragasam 1994; Sahn and Van Frausum 1995).

6.2 Diversification

In much of SSA the more intensive farming systems in general, and monoculture systems in particular, in the absence of rapid technical progress (e.g. regular varietal improvement) have led to declining productivity and are proving unsustainable due to combined effects of rapid depletion of micronutrients, soil erosion and increased pest and disease. Agricultural diversification strategy offers rural households one approach of containing further environmental damage through the establishment of multi-crop and livestock production systems that are economically and environmentally sustainable. Incentives are important in the process of diversification. However, specialisation - which accompanies successful liberalisation and consequent growth - tends to reduce diversity. While specialisation and commercialisation of agriculture are key aspects to sustainable long-term growth (Sahn, Dorosh and Younger 1996), they may reduce the stability and security of rural livelihoods, at least in the short run.

Because adjustment measures aim to improve the terms of trade for tradables they encourage the production of exportables. In many countries in SSA these consist overwhelmingly of one or two primary commodities. Evidence suggests that the incentive structure of adjustment packages did not encourage diversification. Indeed, some of the measures such as cuts in public expenditure had adverse effects on diversification. For example, in Cameroon, cuts in rural producer support services such as input subsidies and extension which were effectively withdrawn from some areas adversely affected diversification, conservation, and the adoption of more intensive production methods (Reed 1996). Also changes in the agricultural research priorities towards export crops in the adjustment process did not help the process of diversification.

6.3 Migration

If adjustment measures are successful in improving incentives to expand the output of tradables, there will generally be an increase in the demand for labour. Adjustment policies affect the relative profitability of different sectors. For example, a rise in the relative price of exports will increase incomes in the tradable sector. On the other hand, overvalued currency which raises the cost of producing tradables in terms of nontradables, directly reduces the profitability of the tradables sector. Deterioration of agricultural terms of trade and growth increase in demand for nontradables, encouraging migration from rural to urban. Other policies that provide cheap food and better services in urban areas also encourage migration. Adjustment might therefore be expected, at first, to slow or reverse rural-to-urban migration.

The limited evidence from SSA (see Horton *et al.* 1994) suggests that where adjustment policies improved the agricultural terms of trade, outmigration from rural areas was reversed. In Cote d'Ivoire, for instance, there was a shift back to agriculture. Similarly, in Ghana, migration out of the agricultural sector was reversed during adjustment. There was a 25.86 per cent net flow of migration into the farming sector in

1983 (Beaudry and Sowa 1994). Moreover, the capital city, Accra, which used to attract 46.5 per cent of migrants prior to 1970 changed to a source of 60 per cent of migrants in 1982-87 (Horton et al 1994).

7 CONCLUSION

There is no systematic improvement or decline in the quantity, quality or sustainability of rural livelihoods as a result of adjustment measures. There are marked differences between countries and regions. Changes in the relative prices of tradables and nontradables provided incentives for rural producers and had a positive impact on rural livelihoods in some countries but failed to create sustainable incentive structures in others. As many countries started adjustment very slowly and implemented only partial reforms, there were serious uncertainties surrounding the lasting effects of such reforms. Such partial reforms carry substantial long-term costs in terms of sustainability of economic reforms.

Furthermore, there is a general consensus in the literature that reform policies overemphasised the issues of pricing to the exclusion of other critical factors, in particular technological development and diffusion. Such technologies were needed to translate improved incentives into more sustainable and productive farming systems. In this respect, adjustment has indeed not been truly 'structural'. It has too often failed to address major structural problems that contributed to agricultural stagnation and poverty in SSA. Severe inequality of rural assets (so that only a few gain, and many lose from higher food prices); research systems that do not deliver new, labour-intensive technologies to farmers; a reform process that often lacks credibility and is prone to sharp reversals - these characteristics are not universal in Africa, but have been regrettably common. They add up to a form of 'non-structural, partial adjustment' that is unlikely to have the full, expected benefits for sustainable rural livelihood generation. However, systematic and unsustainable price distortions penalising the production of tradables is certainly not a solution either.

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SUSTAINABLE LIVELIHOODS RESEARCH PROGRAMME (SLP)

This research project is exploring alternative routes to sustainable livelihoods for poor people in contrasting agro-ecological settings. The research asks two questions: an analytic one - what institutional arrangements enable some poor people to achieve secure, sustainable livelihoods, when others fail?; and a practical one - what policies can support both groups?

The work focuses on the institutional arrangements which allow people to achieve sustainable livelihoods, or otherwise. We understand institutions in a very broad sense to mean the regularised practices or patterns of behaviour structured by rules which have widespread use in society; such institutions may be formal or informal. Such institutions mediate a range of livelihood processes in rural areas. We are focusing on four, related, processes: agricultural intensification, crop-livestock integration, livelihood diversification, and migration.

These livelihood processes will be investigated in four case study countries - Bangladesh, Ethiopia, Mali and Zimbabwe - with research sites located along agro-ecological gradients from high to low natural resource endowment and differing livelihood systems. In each country we work closely with local researchers and officials. The work started in 1997 and will continue to 1999.

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