

PROBLEMS OF MARKET ACCESS IN REMOTE AREAS¹

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Paper presented at a workshop on 'Improving Smallholder Access in Remote Areas' held at Wye College, 8th & 9th July 1999

1. Introduction

This paper attempts to open discussion on the problems of market access affecting smallholder farmers in remote areas. It approaches this looking at the specific market access problems of maize farmers in Sub Saharan Africa, but also raises wider questions about the problems of remoteness.

The paper examines in turn

- the concept of market access,
- the concept of remoteness,
- the importance of remoteness,
- the problems of remoteness,
- the effects of market liberalisation on remote producers,
- potential broader policy responses to the problems of remoteness, and
- potential means of addressing the specific constraints that remoteness poses for market access.

A more detailed treatment of some of these issues may be found in Risopoulos *et al.* (1998).

2. Defining Market Access

We begin by defining **market access** as the opportunity for farmers to participate in a market to their advantage. At its simplest level this requires (a) the operation of a market, (b) that the farmer is able to obtain information regarding profitable opportunities for participating in that market and (c) that the farmer is then able to take advantage of those opportunities if he or she chooses to.

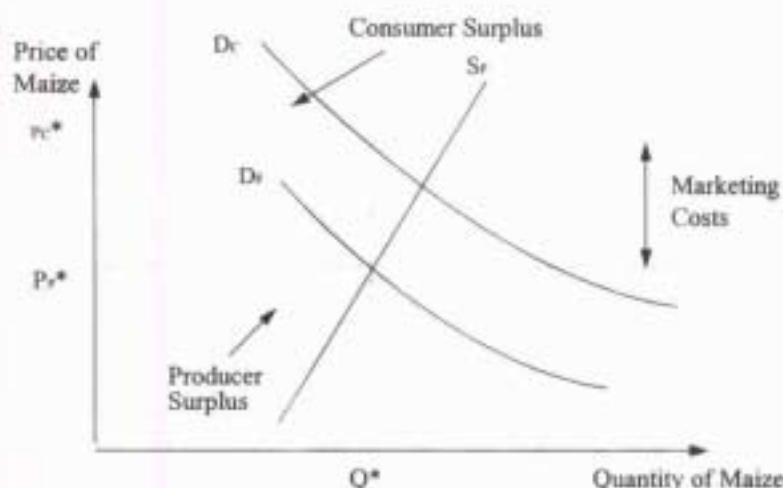
In the context of this study an **agricultural market** is defined as a system or institution that coordinates the production, transformation and consumption of agricultural produce. A market exists for a particular commodity when producers (the supply side of the market) and consumers (the demand side of the market) exchange the commodity at mutually agreed prices. Market participants may also engage in moving, storing, grading and processing the commodity in the expectation that this will enhance its value to consumers. These marketing services incur costs, but producers, consumers and

¹ This paper was prepared as part of research project on 'Improving Smallholder Access to Maize Marketing Opportunities in Sub-Saharan Africa' financed by the Crop Post Harvest Programme (managed by NR International) of the UK Department for International Development's Renewable Natural Resources Knowledge Programme. The findings, interpretations and conclusions expressed in this paper are entirely those of the authors and should not be attributed to Department for International Development or to NR International, who do not guarantee their accuracy and can accept no responsibility for any consequences of their use.

the overall economy gain where the benefits of specialised production and exchange exceed the costs of marketing and allow greater volumes and prices for producers and greater volumes and lower prices for consumers.

This is demonstrated in the traditional **neo-classical analysis** of markets using supply and demand curves with the identification of equilibrium prices and quantities exchanged in free markets, with consumer and producer surpluses. This is illustrated in figure 1, which shows demand at both the consumer market (D_c) and at the farm gate (D_f), and farmers supply (S_f) with the consumer and producer surpluses separated by marketing costs. Market access for producers is described by the relation between the supply and demand curves at the farm gate (S_f and D_f). If these supply and demand curves do not intersect, and the supply curve lies above the demand curve (for example because marketing costs are too high), then there will be market failure, and no market for producers to access. Where there is a market, the supply curve shows increasing volumes being marketed at higher farmgate prices; these increasing quantities arise from (a) individual producers increasing their volume of production and (b) increasing numbers of producers accessing the market.

Figure 1. A Simple Model of Market Access



This simple analysis allows us to identify a number of means by which market access may be promoted:

1. an expansion of consumer demand will, *ceteris paribus*, raise farmgate demand and increase producer and consumer surpluses.
2. a reduction in marketing costs between farmgate and consumers will, *ceteris paribus*, raise farmgate demand and increase producer and consumer surpluses
3. a reduction in producers' costs (either production costs or their marketing costs) will, *ceteris paribus*, raise farmgate supply and, depending on the nature of the cost reduction, allow more producers to access the market and/or allow existing producers to supply more to the market with increased producer and consumer surpluses.

Although this analysis needs to be refined, it provides a helpful starting point in identifying the main issues to be addressed in improving smallholder farmers' access to maize markets. In this paper we do not examine means of expanding consumer demand, nor means of lowering maize production costs, important though these may be. Rather, our focus is on identifying ways in which (a) the wedge of marketing costs and (b) producer's marketing costs can be reduced.

It is also worth noting here that an area that is remote from the wider maize market in terms of distance or communications may be either a surplus or deficit maize area. However, our focus is on remote markets in surplus or potential surplus areas, and remote maize deficit markets are not considered in our analysis².

In subsequent sections we will consider how the special situation of markets in remote areas might require modification of the basic supply and demand analysis of figure 1.

3. Defining Remoteness

Remote areas are, most obviously, ones that are far away. In the context of this project we may identify three aspects or dimensions of remoteness:

- regional distances from major market centres;
- within regions, local distances or difficulties in movement to main roads or local market centres;
- within communities, social marginalisation or isolation, in terms of reduced access to services and social networks.

Remoteness, therefore, has spatial, infrastructural and social dimensions and the most remote farmers will be those who are remote on all three counts.

Remoteness can thus be as much a question of **infrastructure and transportation** as of pure distance. It can take as long - and cost almost as much? - to transport 20 bags of maize 30km on poor quality tracks by local transport as it takes to transport the same maize several hundred kilometres by truck on good quality trunk roads to a major market centre. Transportation costs may also be inflated for female farmers and for very vulnerable households due to higher opportunity costs of their time.

Another aspect of remoteness is the **flow of information**. With physical movement and contact restricted, information (on market prices and demand, location of marketable surpluses, identity of trustworthy business partners, activities of other market agents) becomes more difficult to obtain. The marketing costs incurred by remote farmers and by traders doing business with them may thus be inflated not just by high transport costs but also by high costs of obtaining information (search costs, screening, monitoring contract compliance) and by longer periods needed to complete transactions resulting in lower turnover of capital and lower incomes. Associated with these high information costs, the degree of uncertainty and the risk of loss surrounding marketing activities are likely to be higher in remote areas than in accessible ones.

Remoteness not only affects the flow of information but is in turn a function of information flow. Certain groups of farmers, notably women or very poor households, may have restricted access to information due to time and movement constraints associated with the collection of information (opportunity costs again) or cultural restrictions. Such groups, though not spatially more remote, may nevertheless be considered remote in informational terms. Given this emphasis, it is worth noting that the extent of availability of and access to **telecommunications** infrastructure also affects the degree to which an area or village or category of farmers is "remote".

An important aspect of remote areas that we shall only mention briefly at this stage, but will develop further later, is that market demand for production in remote areas is often a "**residual**" demand after buyers have obtained what supplies they can from more accessible areas. From the producers' point of view, this increases the uncertainty associated with production and marketing decisions, particularly when, as in rainfed agriculture, the balance of supply and demand in the wider markets can fluctuate widely from year to year as a result of changing climatic conditions across the whole region affecting production, or due to changes in government policy as regards imports (including food aid) and exports.

² Furthermore, we concentrate our attention primarily on maize surplus producers within these areas. It is recognised, however, that, even in net surplus producing areas, there may be a substantial minority of food deficit households (see, for example, Jayne and Chisvo 1991 for the case of Zimbabwe).

The residual nature of demand in remote areas and the uncertainty and lack of information regarding traders' activities also has implications for farmers' **storage costs**. Farmers wishing to produce for the market cannot be assured of the time at which they may be able to sell to traders, since traders' activities are uncertain. As a result farmers need to be prepared to store their produce for uncertain periods of time, beyond their control. Such storage we refer to as **involuntary storage**, and it incurs 'involuntary storage costs' in terms of: the need for storage facilities, illiquidity at a time when many farmers have a high demand for cash, financing costs for stock, and storage losses. These costs are 'involuntary' in the sense both that the farmer may well prefer to sell her maize instead of storing it and that she has little control over the time over which storage will be necessary (since it depends upon the uncertain arrival of traders). Involuntary storage should be distinguished both from storage to meet own future consumption needs and from speculative storage designed to capitalise on future movements in the price of grain.

Finally, it is worth noting the impact that remoteness has on the cost of purchased **inputs** (largely through increased transportation costs). The "scissors action" of inflated input costs and depressed output prices may make use of purchased inputs, such as improved seed, inorganic fertiliser and crop protection chemicals, both uneconomic and less affordable in remote areas, even while it remains attractive in more accessible areas. Not only is intensification of production discouraged; any significant impact in terms of expected lower marketed surplus will in turn tend to discourage traders from coming to buy from the area at harvest time. It may also increase the per unit marketing costs incurred by those traders who do come (thus further reducing output prices - a vicious circle) and we may thus expect production in remote areas to be generally more extensive than in more accessible areas.

4. The Significance of Remoteness

We are not aware of any explicit attempts to assess the significance of remoteness as a problem. We therefore limit ourselves here to some comments which may attempt to provide some perspective on this.

Problems associated with remoteness have long been included in discussions of the causes and classifications of poverty. Chambers, for example, identifies *isolation* as a characteristic of poverty, and *locational deprivation* of those living in marginal areas as an important category of poverty, although isolation may not refer to physical isolation, and 'marginal areas' may refer to areas with low productivity as well as to remote areas, although the two are often related. Jazairy, Alamgir and Panuccio (1992) categorise peripheral poverty as one of five types of rural poverty. In early debates on market liberalisation, it was recognised that liberalised market systems would pose special problems for remote areas (see for example Coulter and Golob, 1992). In the mid 1990's, however, the issues seem to have been largely dropped by policy analysts and researchers (perhaps as intractable), and it is only now that problems facing remote communities are beginning to emerge again in policy debates on poverty reduction. Thus Ellis (1998) identifies remoteness as 'typically associated with greater poverty and fewer livelihood options', and we have an impression that the problem of remoteness is beginning to crop up more in policy debates.

Any assessment of the significance of remoteness as a problem contributing to rural poverty needs to take account not only of the nature of its effects on people but also of the numbers of people directly and indirectly affected adversely by remoteness. One of the reasons for remoteness being given less emphasis is that more remote areas tend to be less densely populated, a point recognised by Ellis. However, the severity and persistence of rural poverty in Sub Saharan Africa suggests that the problems of remoteness may impact on large numbers of poor people.

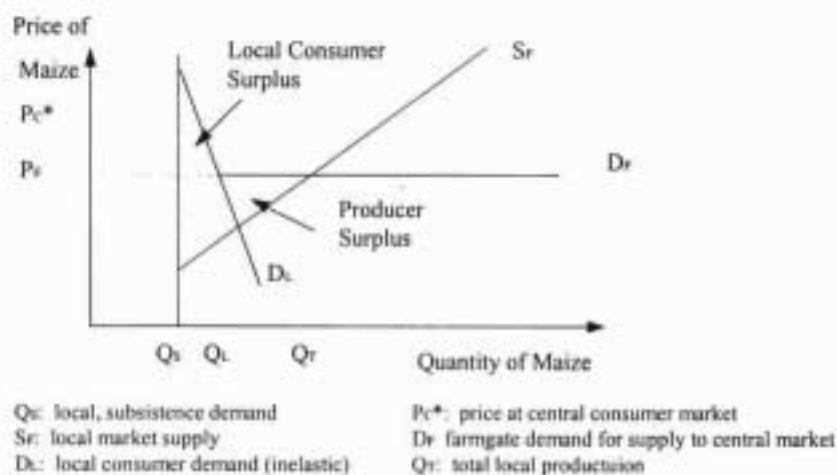
4. Problems of Remoteness

4.1 Market access in remote areas

We now extend and refine our earlier neoclassical analysis of market access to analyse the problems affecting maize markets in remoter areas in Sub Saharan Africa. These markets are characterised to a greater or lesser extent by a significant amount of subsistence consumption by maize producing households (poorer farmers may be net consumers), by limited local demand for purchased maize, and

by having the potential to supply to more central consumer markets only a limited proportion of the maize these markets demand. This situation is shown in figure 2. Q_s indicates a fixed quantity required for on farm subsistence production, assumed to be independent of price³. P_c indicates the price in the wider consumer market outside the remote area, a price which is largely independent of production in the remote area. This gives rise to a very elastic demand for local purchases to supply the wider consumer market (D_f), with a price differential ($P_c - P_f$) reflecting marketing costs (as in figure 1). Demand for purchased maize for consumption locally is shown as small relative to subsistence consumption and inelastic (D_l). Finally, S_f is the local maize farmers' supply curve. As this is drawn, it intersects D_f at quantity Q_T , with Q_s produced for subsistence consumption, ($Q_l - Q_s$) sold in local markets and ($Q_T - Q_l$) sold into the wider consumer market. Clearly if S_f were drawn higher (as a result of higher production or marketing⁴ costs incurred by producers) or D_f drawn lower (as a result of higher marketing costs incurred by traders) then S_f and D_f might not intersect and there would be market failure as regards access to the wider consumer market, although there would still be limited local sales. The effects of this on broader consumer welfare might be small, but there would be large negative effects on maize producer welfare in the remote area, and (if local supply was reduced) high local prices might also impact negatively on consumer welfare for net maize consumers in the remote area.

Figure 2. Market Access in Remote Areas



4.2 New Institutional Economics Insights into Market Access in Remote Areas

The neoclassical analysis of market access in remote areas in the previous section is inadequate in that it fails to explicitly allow for some important features of remote markets as described in section 2.3, namely the problems of information difficulties and costs, and associated uncertainty in marketing transactions. While the analysis does allow for the residual nature of remote markets in the sense that their price formation to supply the wider market depends on that wider market, it fails to allow for the effects on producers of the high degree of uncertainty in this residual demand. In this section we adopt insights from the new institutional economics to address these issues.

³ Although farm household models predict a more complex relationship between price and own consumption, with the substitution and profit effects pulling in opposite directions (see for example Barnum and Squire; Low; Ellis; Singh, Squire and Strauss) the nature of this relationship varies and for our purposes it is reasonable to assume that the positive or negative effects of price on own consumption are relatively small.

⁴ It is recognised that, if farmer marketing costs are included within S_f , then the supply curve for the local market might be different to that for the wider market. However, adding this complexity to the diagram does not add to the basic analysis.

Some of the assumptions of neo-classical economics (perfectly competitive markets with perfect information) clearly do not apply in the semi-subsistence peasant economies prevalent in many maize producing areas in sub-Saharan Africa. Attempts to extend economic analysis to take account of the private and social costs and benefits of first establishing institutions that allow market or non-market exchange and then of engaging in exchange are generally described under the label of **New Institutional Economics** (NIE). Nabli and Nugent (1989) classify the ideas of NIE into two main schools: the transaction cost school and the collective action school. The latter explores the conditions under which economic agents will seek to cooperate in both economic and political spheres, and has important insights to offer in, for example, the examination of conditions under which farmer groups are likely to be successful in providing marketing services to members, a topic we will return to later in this review. In our examination of market access in remote areas, however, we are more concerned with the insights offered by the transaction cost (or transaction economics) school.

Within the transaction cost school, a further distinction may be made between the study of the 'institutional environment' and of 'institutional arrangements'. This distinction recognises that any exchange between two parties occurs in an **institutional environment** made up of external political, social and legal rules governing production and exchange, whereas an **institutional arrangement** is the specific arrangement between economic units that governs the way in which these units relate to each other (Davis and North, 1971). **Transaction costs** are an important link between the two concepts of institutional environment and institutional arrangement as the transaction costs involved in the production and exchange of a particular commodity depend upon both the wider institutional environment in which economic activity occurs, and upon the specific institutional arrangements governing that economic activity. This analysis offers important insights into the study of constraints on market access and of potential means of overcoming these constraints, as it suggests that stakeholders (farmers or traders) and external agents (NGOs, local and national governments, and donors) may work to improve market access by making changes to the institutional environment or by modifying institutional arrangements in order to reduce transaction costs.

Dorward (1998a and 1998b) has put forward a conceptual framework that relates transaction costs with the more conventional costs allowed for in neo-classical analysis (such as production, processing, storage and transport costs, often referred to as transformation costs in NIE literature) in the analysis of buyer-seller relations. Developing Williamson's analysis of governance costs (Williamson, 1991), farmers' and traders' costs may be divided into transformation or production costs, transaction costs (the costs of first gaining information to identify and screen other parties to a contract and then of making and enforcing a contract), and risks of loss (as a result of production failure, of wider market price changes, or of default by the other party to the contract).

We can now extend our neo-classical model of market access in remote areas to include both transaction costs and the costs associated with production, market and transaction risk, alongside the more conventional transformation costs. This does not introduce any changes to the structure of figure 2 as it is drawn. However, the lines S_r and D_r (local supply and central market demand from the remote area respectively) will now depend not only conventional production and marketing costs, but also on transaction and risk costs. Thus S_r would shift to the left or rise to represent increases in marginal costs of production and exchange facing existing and new producers, while D_r would fall to allow for a margin below P_c that would cover transaction and risk costs as well as transport, storage and other transformation costs. This upward shift of S_r and downward shift of D_r will reduce Q_r , the quantity sold in the market, reduce the producer surplus, and make market failure more likely. Local consumers will benefit if it depresses the price at which traders buy maize to supply the central markets, but if market failure occurs then they may face higher local prices too.

This analysis has significance for our study of farmers' access to maize markets in remote areas in a number of ways.

- First, it recognises the importance of the inter-relationship of transformation costs, transaction costs, and risk. By including risk as a cost we are able to include in our model of market access a variable of great importance to farmers and traders.
- It recognises that farmers and traders seek to find technical and institutional means of minimising the sum of transformation, transaction and risk costs by choosing to adopt particular cost minimising combinations of production methods and institutional arrangements. The set of feasible institutional arrangements and their cost characteristics will depend, *inter alia*, upon the

institutional environment. Institutional arrangements and the institutional environment then join technological innovation and more conventional economic and organisational policy changes as important spheres in which external actors and stakeholders can act to improve market access.

- Institutional arrangements may include **non-standard** and non-competitive forms of market relationship, and this may involve particular traders requiring dominant monopsonistic positions in an area in order to make it worthwhile for them to trade. This may arise where traders need to purchase large volumes of maize to cover their more or less fixed transaction costs, or where traders need to engage in longer term relationships demanding trustworthy behaviour by farmers or farmers' groups, for example where credit is being offered or where significant investment costs are involved in arranging transport to pick up produce at a particular time and place. Farmers' groups may also need to engage in a monopolistic relationship with traders, for similar reasons. However, difficulties may arise in maintaining the monopolistic or monopsonistic position on the one hand, but on the other hand preventing the monopolistic or monopsonistic party from wielding undue power to limit purchases or sales and to control prices to their own advantage. Dorward *et al.* (1998a) show that where traders share information about farmers or where farmers and traders invest in relationships of trust it may be possible for more competitive market relationships to emerge, but such relationships may only be possible in specific situations.
- By explicitly bringing transaction and risk (reduction) costs into the analysis, the theoretical framework takes account of the widely recognised but often intangible benefits of improved communications associated with improved telecommunications or with improved mobility as a result of investments in transport infrastructure and services.

The analysis above has taken account of spatial and informational dimensions of remoteness. We now turn to consider the effects of the social dimension of remoteness.

4.3 *Social analysis and market access*

Our model may be further developed to account for differences in the transformation and/ or transaction costs experienced by different households or groups of farmers (the third dimension of remoteness outlined earlier at the beginning of section 3). Female farmers and vulnerable households may experience specially high transformation costs (storage and transport) and transaction costs (searching, screening, establishing and enforcing contracts) due to the high subjective valuation of the opportunity cost of their time. In addition, their transaction costs may be inflated by their relatively restricted access to information (as a function of opportunity cost of their time and/or cultural restrictions and limited sphere of social relationships). Limited access to credit (due to lack of collateral and/or for cultural reasons), as experienced by many female farmers and vulnerable households, may also limit their ability to pay for transport, to hold stocks, or to take risks. Finally, poorer and more vulnerable households may be particularly averse to taking risks that may threaten their livelihoods, in which case their subjective valuation of the costs involved in transaction and production risks may be higher than those of other households.

Our analysis must therefore consider farmers not as a homogeneous category, but must allow for the socio-economic factors which constrain access for certain households or groups of farmers to information, transport, credit and storage, and thereby inflate their transformation and/or transaction costs. Von Oppen *et al.* (1997) for example found in studies in India, Kenya and Sudan that farmers located closer to market centres had higher levels of aggregate productivity than more distant farmers (all farmers sampled had access to markets). However whereas in the Indian sample the benefits of better access were greater for farmers with smaller farms, in Kenya and Sudan the benefits were greater for larger holdings. In India the agricultural productivity gains from market access were due more to the benefits of specialisation in production closer to markets, in Sudan and Kenya the productivity gains from market access were due more to more intensive input use.

We can now further extend our model of market access to allow for this socio-economic dimension of remoteness. This analysis does not introduce any new costs into the NIE model of the previous section, as the particular differential costs that disadvantaged groups may face (information costs, uncertainty due to lack of information, and high subjective valuation of risk and of the opportunity cost of time) are already allowed for in the model. Rather this analysis suggests that within any market members of disadvantaged groups are likely to be producers or potential producers with relatively high marginal

costs. It was noted earlier, in section 2, that a positive supply response to increasing price arises partly from existing producers expanding production as price increases, and partly from new producers entering the market as price increases. If we focus on this second component of the supply response, then we can identify disadvantaged groups of producers (producers that are 'more remote' in terms of the socio-economic dimension) as those producers who, with their higher production and marketing costs, only enter the market when prices are high, and their situation is therefore described by the upper, right-hand end of the supply curve.

4.4 Improving market access for remote farmers

Figure 3 develops this line of analysis to provide a more generalised model of the relationship between remoteness and market access. The horizontal axis, instead of measuring volumes traded as in a conventional supply and demand analysis, represents some measure of the remoteness of producers - this could allow for spatial, informational and social dimensions. The upward sloping line P_R represents the price that producers require in order to enter the market, as increasing remoteness incurs increasing costs in terms of varying effects on input costs, information costs, transportation costs, and subjective valuation of risk and time. This is very closely related to the supply curve in figure 2. On the demand side, D_C and P_C in figure 3 are identical to D_C and P_C in figure 2, however the downward sloping line P_O below D_C represents the maximum price that traders can afford to offer to allow them to cover the costs of buying, transporting, perhaps storing, and then selling into the central market. Where P_R lies below P_O then farmers are offered a price above the minimum they require to make production and sale worthwhile, and they access the market. This occurs to the left of the intersection between P_R and P_O where remoteness is less than R . To the right of this intersection, where remoteness is greater than R , traders can only afford to offer farmers a price which is lower than the price farmers need to cover their costs, and market failure occurs.

Figure 3. Remoteness and Market Access



We draw the following conclusions from consideration of the model presented in figure 3:

- For the most remote farmers the gap between P_R and P_O may be too large for there to be any possibility of bringing P_R below P_O and it is unlikely to be worthwhile to attempt to bring these farmers into the market: problems of market access are probably not the most pressing issues affecting the most disadvantaged groups and other means of improving their livelihoods need to be sought for these people.
- In order to expand market access, effort should be concentrated on reducing traders' and farmers' costs for those farmers located to the right of R , but not too far to the right. This

suggests an emphasis on reducing those costs that increase with remoteness, for example transport, storage, information, credit, and risk costs.

- It is possible that a reduction in these costs for moderately remote farmers will produce greater economic benefits than a similar reduction for less remote farmers. Referring to figure 3, for farmers who are located to the left of point R (those farmers with current market access) P_R is lower than P_O . This suggests that farmers are gaining prices above those that are needed to induce them to produce, or traders are gaining margins greater than those that are needed to induce them to trade: in economic terms, farmers or traders are gaining economic rents. We might expect prices to more or less follow P_O , with economic rent accruing to the owners of factors of production involved in production, particularly to the less mobile factors of land and, to a lesser extent, labour⁵. Thus although reduction in transaction costs for these less remote farmers who already have access to the market may induce some extra production, the major benefits from such cost reductions may accrue as economic rent to owners of land and, to a lesser extent, labour. In contrast, reductions in transaction costs for more remote farmers, or for traders serving them (with an upward shift of P_O and/or a downward shift of P_R) may be more directly productive in inducing extra production, as well as having more socially desirable effects in raising earnings of more remote (and often poorer) farmers and owners of land and labour. This line of argument, however, assumes that factors of production in more accessible areas are not only fully utilised, but also relatively fixed, whilst factors of production in more remote areas are underutilised. In practice, higher prices for farmers in more accessible areas might encourage greater use of purchased inputs or the hiring in of migratory labour, whilst farmers in more remote areas might have plenty of land but be constrained by lack of labour and be unable to obtain hired labour because of their remote location. The relative magnitude of supply response to a reduction in transaction costs in different areas is, therefore, an interesting empirical question.

5. The effects of market liberalisation on remote farmers

Having examined the problems that remoteness may cause for producers of a crop such as maize, we now briefly review the effects that market liberalisation has had on remote farmers, in particular on farmers in remote areas.

5.1 *Pre liberalisation maize marketing systems*

Following independence, most African governments followed broadly interventionist economic policies with governments both regulating markets and actively intervening in markets through parastatals. As a result in the late 70s and early 80s many countries had overvalued exchange rates, government consumption was too high as a proportion of GDP, and trade was severely hampered by a series of tariff and non-tariff barriers. The effects of these distortions, and of government regulation and support to parastatals operating in different parts of the economy, was often to tax exports and import substitutes, to subsidise imports, and to protect inefficient parastatals. The agricultural sector, the most important sector in most SSA economies, was particularly affected. Intervention in staple food markets was intended to prevent local and national food supply crises, to avoid import dependence, to ensure cheap and stable consumer prices, to support and stabilise producer prices, and to promote structural change in rural economies (Jones, 1998). However, these policies have been increasingly recognised as inappropriate and unsustainable due to conflicts between policy objectives and instruments, indirect and (to a lesser extent) direct taxation, rent seeking by national and local bureaucracies, and inefficiencies and corruption with large fiscal deficits in the parastatal marketing boards that dominated output (and input) marketing for many staple food commodities (World Bank, 1994; Jones, 1998).

In Eastern and Southern Africa, for example, where maize is a very important staple crop, state marketing boards enjoyed a statutory monopoly over a wide range of domestic marketing functions

⁵ This assumes one or more of the following: a reasonably competitive market; that traders are unable to discriminate between farmers; that the costs to traders of discovering P_R for each individual farmer are prohibitive. Where prices are below P_O then traders are capturing economic rent.

and international trade. Pan-territorial prices were fixed for the season, and represented significant subsidies for certain consumer and producer groups (Jones, 1998). To assure the dominance of the controlled marketing system, private and direct maize trade from surplus to deficit areas was suppressed. This made food deficit rural households dependent on a unique, official marketing channel. In Zimbabwe this raised their expenditure by as much as 30%, because maize was extracted from rural areas to urban-based industrial mills and maize flour then had to be transported back to food-deficit rural areas (Jayne and Chisvo, 1991).

The analysis of figure 2 does not need any fundamental adjustment to describe the market situation in remote areas under marketing boards operating a statutory monopoly and pan territorial pricing. D_r is now determined by the pan territorial price fixed by the government but will have broadly the same shape (highly elastic) although it may have shifted relative to P_c and S_r . We will discuss the effects of parastatal activities on market access when we examine the impacts of liberalisation in the next section.

Maize is a secondary crop in many Sahelian (West African) countries, after rice and wheat in urban areas and sorghum, millet and cassava in rural areas. Most Western African countries left maize marketing and pricing in the hands of the private sector (CIMMYT, 1990). Parastatal marketing boards enjoyed nominal statutory monopolies but rarely handled more than 5% of cereal production, and maize only represented a fraction of that (Jones, 1998).

5.2 *Liberalisation and its effects in theory*

Discussion of effects of liberalisation is complicated by the variation between countries as regards both their situation prior to liberalisation, and the extent, pace and mechanisms of liberalisation measures adopted. We therefore examine first what liberalisation involved in theory, and then relate this to the neoclassical model we have developed to describe market access in remoter areas. We then review the experience of a range of different SSA countries, and, in the light of this, introduce into our neoclassical model insights from a new institutional economics approach and from social anthropology.

We can examine liberalisation and its effects on maize markets in two broad categories, first structural adjustment policies aiming at macro-economic and sectoral change, and second specific reforms of maize markets.

Structural adjustment policies promoted by the World Bank and aiming at medium term reorientation of the economy generally involved some combination of the following elements, depending upon the status and structure of the economy and domestic political concerns and negotiations (Stewart, 1991):

- mobilisation of domestic resources through improved fiscal policies
- improving efficiency of resource use (particularly in agriculture) through privatisation of public sector organisations or functions; reduced price control; reduced subsidies; import liberalisation and credit reforms
- liberalised trade policies with tariffs replacing import quotas, and lower tariffs
- organisational reforms with strengthening of public sector capacity.

Macro-economic targets included devaluation, reductions in government spending (for example cutting back on overstaffed civil service), keeping inflation and the budget deficit low, and raising real interest rates. Trade was encouraged through tariffification and rationalisation of import barriers, while foreign exchange restrictions and export monopolies were eliminated (World Bank, 1994).

As agriculture forms a major part of the economy in most sub-Saharan African countries, reforms in the agricultural sector were expected to make an important contribution to the economy as whole. Agriculture itself was expected to benefit from devaluation, increased trade, and liberalisation of pricing and marketing of commodities, with producers earning higher prices for exports or import substitute commodities. Privatisation of parastatals' marketing activities and removal of their monopoly and regulatory powers, was expected to lead to more efficient marketing. Free markets, without pan territorial pricing, would increase efficiency by applying competitive pressures on marketing costs and by allowing market forces to ensure that different regions and producers invested in producing commodities where they had 'comparative advantage'. Removal of subsidies on inputs such as fertilisers would also promote efficiency in resource allocation and use.

Jones (1998) identifies seven distinct types of measure in staple food market reforms: regulatory reform reducing regulatory constraints (for example on private sector trading, terms of marketing contracts, or grain movements); price reform (for example increasing official prices, changing the way that they were set, setting price bands, or abandoning all price setting and support); changing the role and operation of state marketing agencies (for example their statutory function, management, or financial systems); replacing universal subsidies with transfers; support to the development of private marketing channels; changing external trade policy with increased use of tariffs and reduced use of quotas; and changes in macroeconomic policy (for example exchange rate devaluation). The last two measures clearly fit in with broader structural adjustment measures. To this list we might also add reforms in sectors that exert an impact on the functioning of food markets, most notably the financial and transport sectors.

An important effect of structural adjustment and market liberalisation on remote maize farmers and traders is 'decapitalisation'. The 'scissors action' of remoteness inflating input costs and depressing output prices was referred to in our discussion of remoteness in section 3, and this has been reinforced by the effects of structural adjustment and market liberalisation on semi-tradeable and non-tradeable commodities, with devaluation and subsidy removals leading to rapid price rises for imported inputs (such as fertilisers) ahead of price rises for farm products. This 'decapitalises' both farmers and the domestic traders who sometimes supplied inputs on credit, as crop sales each season have been able to purchase declining quantities of inputs. A vicious circle of decapitalisation can then occur as increasing input prices reduce the value of farm production, reducing the ability of farmers to purchase and use inputs, leading to declining volumes of production in subsequent seasons, further reducing farmers' ability to purchase and use inputs. This can occur even where the use of purchased seasonal inputs remains profitable for farmers who are able to obtain capital.

5.3 *Experience of liberalisation and its effects in practice*

The impact of structural adjustment programmes remains a hotly debated topic and assessing the effect of these policies on economic and agricultural growth and the impact they have had on poverty is a highly controversial issue (World Bank, 1994; Mosley and Weekes, 1993; Mosley *et al.*, 1995; Raikes, 1997).

In examining country experience in liberalisation we need to examine the differences in their initial, pre-liberalisation maize marketing systems, differences in the macro-economic and sectoral actions taken in the liberalisation programme, differences in market reform, and consequent differences in outcomes for maize markets. It is helpful here to draw a general distinction between countries where maize is a major crop and a major part of the diet, and those where maize is a much less important. Countries in the first category tend to be in Eastern and Southern Africa, and in these countries maize market reform has been extensively documented as a major part of their liberalisation programme. In other sub-Saharan countries, in West and Central Africa, maize is generally less important in the economy, there was much less intervention in maize markets prior to liberalisation, and there appear to be fewer studies documenting the effects of liberalisation on maize markets.

We briefly review each region in turn, drawing on lessons learned from our own examination of the experience of remoter areas in particular countries (see Risopoulos *et al.*, 1998) and on a number of broader reviews examining both the effects on maize markets of structural adjustment programmes (Jayne *et al.*, 1998; World Bank, 1994; Stewart, 1991; Mosley and Weeks, 1993; Mosley *et al.*, 1995; Raikes, 1997) and the more specific effects of maize market reforms (Jayne and Jones, 1997; Jones, 1998; Jones and Wickrema 1998a and 1998b).

5.3.1 *East and Southern Africa*

In Eastern and Southern Africa, where maize is a dominant staple, state marketing boards generally played a dominant role prior to liberalisation, with administered pricing (generally offering guaranteed, pan territorial producer prices and consumer subsidies) and suppression of both private trading and small-scale processing. Driven largely by donor pressure and by the need to reduce the deficits of marketing boards, government reforms involved the lifting of restrictions on private trading, some withdrawal of marketing boards from direct marketing activities (this was often largely forced on them by their inability to engage in these activities), price reform (again, the importance of parallel markets meant that official prices were already relevant to only a part of the market), and lifting of restrictions on grain movements.

The main beneficial results from these reforms have been reductions in marketing and processing costs, expansion of small scale trade and processing, some improvement in spatial integration, and a wider range of products on the market (such as less refined grades of maize meal) (see for example Jones, 1998). Jones considers that the benefits of efficiency gains have accrued mainly to consumers and to larger scale producers. However, consumers do not appear to have benefited in some countries, such as Malawi, and there have been difficulties in other countries, such as Zambia, where urban consumers were used to receiving large subsidies.

There appears, however, to have been only a limited supply response to liberalisation. Jayne and Jones (1997) argue that maize was not generally heavily taxed in Eastern and Southern Africa prior to liberalisation. Although currency over-valuation constituted an indirect tax on food producers, this was more than compensated by transport subsidies inherent in the pan-territorial pricing structure, input subsidies, credit, research, extension and investment in marketing infrastructure (this point is also made by Raikes, 1997). With liberalisation and privatisation, government credit and input subsidies were eliminated, exerting a negative influence on maize production especially for low-input semi-subsistence households and producers in remote areas. By contrast, producers close to urban areas, who subsidised remoter producers under pan territorial pricing regimes, have generally benefited from food market reform. At national level, the reforms have so far failed to boost grain production in countries where the single-channel marketing system provided reasonably effective services to smallholders (for example, Zimbabwe, Kenya and Malawi). Indeed maize production and productivity has fallen in many cases. Where the pre-liberalisation marketing system was already showing signs of collapse prior to the onset of reform (for example, Tanzania), the story is more encouraging, although per capita maize production may still be on the decline.

Jones (199) notes that the need to boost productivity growth in smallholder agriculture is a critical issue facing policy makers. This appears to be a particular problem in remoter areas, where three other issues highlighted by Jones (high transport costs, increased price instability for consumers and producers, and limited capacity of traders to take over the functions previously fulfilled by the marketing boards) are particularly serious.

5.3.2 *West and Central Africa*

In West and Central Africa many countries have been consistent importers of cereal grains, and food aid, pricing policies and over valued exchange rates tended to depress cereal prices for local producers (Jones, 1998). Although parastatal marketing boards nominally enjoyed statutory monopolies in some countries, in practice they rarely handled more than 5% of cereal production with an active indigenous private sector sometimes influenced by larger traders to show tendencies to concentration and collusion (Jones, 1998). The effects of liberalisation on maize markets have therefore not been so much through changes in the regulatory framework of the market or in the roles of marketing boards as through the effects of broader macro-economic and sectoral liberalisation on relative prices of grain and other crops, on the costs of imported and previously subsidised inputs, and on transport costs. In Ghana, for example, the Ghana Food Distribution Company never accounted for more than 10% of the marketed maize surplus, buying from agents at a fixed official price, the agents buying from farmers. In recent years GFDC has purchased very little maize, although it does control much of the storage space. Coulter (1997) identifies two important aspects of 'liberalisation' affecting maize markets: (a) the increased costs of inorganic fertiliser as a result of the elimination of fertiliser subsidies and devaluation of the cedi and (b), more recently, a more positive government attitude towards larger scale private sector maize traders.

Post-liberalisation production trends in West Africa have generally been more encouraging than those in Eastern and Southern Africa. Producers have benefited from the improved macroeconomic climate and had not grown accustomed to the level of production support enjoyed by counterparts in Eastern and Southern Africa under the parastatal marketing systems, whilst there existed a stronger trading class ready to take advantage of improved market conditions.

5.3.3 *The effects of liberalisation on remote areas*

As noted earlier, the effects of liberalisation of maize markets on remote areas do not appear to be particularly well documented in general reviews of maize market liberalisation in sub Saharan Africa. However, examination of studies of particular countries' experience in Southern and Eastern Africa suggests that the removal of guaranteed pan territorial pricing with consequent lower and unstable

producer prices, removal of input credit schemes and subsidies, continual exchange rate devaluations, and weakness of the emerging private traders have had a differentially negative effect on producers in remote areas. In one early study Coulter and Golob (1992) noted how prices received by farmers in Mbozi district of Tanzania dropped off sharply as one moved away from the main road. Where there was only limited government intervention in maize markets prior to liberalisation, however, (as in many Western and Central African countries), liberalisation *per se* has had less of a differential effect on remote producers. There is no reason to suppose, however, that the post-liberalisation situation of these Western and Central African remote producers is any better than that of producers in remote areas of Southern and Eastern Africa; only that they did not enjoy the same pre-liberalisation benefits.

5.4 Cross-border trade

We conclude our discussion of the effects of market liberalisation with a brief review of the extent to which liberalisation has affected imports and exports between neighbouring countries.

5.4.1 The scope for benefits from cross border trade

Writing during the early stages of market liberalisation, Kingsbury observed that incentives for engaging in informal intra-regional trade in Southern Africa are greater than for official trade (Kingsbury, 1989). Remote regions often can be served better through informal trading networks as official imports rarely reach isolated regions or villages because of poor transport from the centre.

For a country such as Tanzania, for example, the case for intra-regional trade is strong, particularly with Zambia, Malawi and Congo: maize harvests are negatively correlated with those of most Southern African countries (Coulter and Golob, 1992), and most of the country's population as well as its more favourable maize growing areas are located near its borders, making food self-sufficiency an expensive policy. Under such circumstances intra-regional trade has the potential to stabilise food supplies and prices (Jayne *et al.*, 1997).

5.4.2 The extent of cross border trade in maize in sub-Saharan Africa

Any assessment of cross border trade faces serious difficulties in estimating unofficial trade flows. USAID recently commissioned a study on cross-border trade between various African countries. The conclusions of the study were (Ackello-Ogutu, forthcoming):

- The informal private sector is capable of moving large quantities of grain across borders, and this leads to serious GDP underestimates. Most traded agricultural products are produced by smallholders.
- Directions of trade flow seem to obey the theory of comparative advantage and indicate important complementarities in the regional economies.
- Trade in agricultural and food commodities is complex and heavily protected. There are serious flaws in domestic food distribution systems due to poor trade information and infrastructure, excessive regulations (licensing, tariffs, quotas, and administrative delays, harassment and corruption) all of which discourage formal trading (note that the study was carried out from 1994 to 1996, when market liberalisation was well under way).
- Regional markets are fairly well integrated and responsive to profit incentives. Informal unrecorded trade seems to thrive where high tariffs and other non-tariff restrictions block trade.

5.4.3 Constraints on cross border trade

The expansion of cross border trade faces many constraints (Kingsbury, 1989; Ackello-Ogutu, forthcoming). Some of these constraints are specific to cross border trade, for example shortages of foreign exchange due to rationing (although this should be less of a problem now than it was a few years ago); bureaucratic controls on imports and exports; closure of borders; food subsidies by relief agencies; and harassment and demands for high bribes by public officials. Other constraints are not specific to cross border trade, but are the results of more general problems facing traders in liberalised domestic markets. Thus the recent USAID study in Eastern and Southern Africa (Ackello-Ogutu, forthcoming) found that traders tend to be local entrepreneurs, farmers or even public officials who minimised risks by holding small quantities and diversifying and did not specialise in storage, transportation or processing but did a bit of everything. They lacked storage facilities and relied on hired transport, hiring porters to transport merchandise along footpaths in small quantities. Market

information was inter-personal. Important constraints on trade under these circumstances are lack of market information, inadequate transport infrastructure, and lack of working capital.

6. Responses to Problems of Remoteness

Given the problems of remote farmers in accessing liberalised maize markets, we need to consider appropriate policy responses. We identify four main options: *laissez faire*; diversification; institutional investment to reduce transaction costs; and infrastructural investment to reduce remoteness. The latter two options are closely related.

A common response of policy analysts to market access problems encountered by more remote producers of a particular commodity is to state that these producers do not have comparative advantage with regard to this commodity, and that there is little point in external interventions and investments that work against natural comparative advantage. Such arguments fail to recognise the importance of dynamic institutional and infrastructural variables⁶ and of changing factor prices in determining comparative advantage. Comparative advantage is not determined solely by "natural" advantage, and unless a particular region or class of producers possesses a natural advantage which is very specific to the production of one particular commodity, as economic growth and development occurs factor prices will generally rise, with significant gains in economic rents accruing to owners of those factors, until high factor prices outweigh natural advantages and comparative advantage is lost.

This suggests that to some extent assessment of comparative advantage is an *ex-post* "analytical" exercise and may carry the danger of "rationalising" the *status quo*. However, particularly under conditions of imperfect information, it is quite possible for markets to "over-shoot". In the case of some remote areas, it is possible that the shift in trading focus to more accessible areas following marketing liberalisation has been something of an over-reaction, that owes as much to the weakness of the private trading sector and the underdevelopment of information systems in remoter areas as it does to "hard facts" about transport costs. Thus, encouragement of farmer-trader links in such areas could lead to a partial correction back in favour of areas that were important surplus producers prior to liberalisation.

Arguments about comparative advantage need to be concerned with positive questions about where a region's or a particular group's comparative advantage does lie, not just with acceptance that it does not comparative advantage in a previously dominant activity. We consider three possibilities: extensification, migrant labour, and diversification.

As we have seen, pre-liberalisation systems supported the intensification of maize production systems in many remote areas, with use of purchased inputs to obtain higher yields and higher returns to land and labour⁷. With the lower population densities found in many remote areas, a greater emphasis on extensive production might be an alternative to this, without use of purchased inputs. At the outset of this study we considered this as a possible route for maize producers. However, recent observations from Ghana and Tanzania suggest inherent problems with this approach as it requires more dispersed production, which exacerbates more local problems of remoteness, and, with reduced volumes of outputs, increases costs and reduces returns from maize trading.

Extensification therefore appears to generally imply a retreat into subsistence production and hence remote producers still need to find an alternative means of obtaining cash income: for many remote areas comparative advantage may lie in the supply of migrant labour. This carries social costs that may not be captured by market prices, but are nevertheless important policy considerations, particularly

⁶ For example, a particular production area might be quite difficult to get to, but this could be more than offset, from the trader's perspective, by a well-functioning farmers' organization that coordinates local assembly of produce, guarantees quality and handles payment to members. Regarding infrastructure, many areas that are now considered accessible are so because of "chance" past decisions whereby a major road or railway was routed through them.

⁷ Even here it must be recognised that generally only more privileged producers benefited directly from this, but poorer maize surplus households not using intensive production methods benefited from the general economic activity associated with the maize economy. The benefits of this for poor maize deficit households may be more ambiguous, as these benefits may have been offset by higher maize prices.

where policy is concerned to attack rural poverty. This point is illustrated by Bryceson's examination of economic and social changes in the Southern Highlands of Tanzania from the 1960's to the 1980's as it moved from a 'labour reserve', with colonial government concerns about the long term social and political costs of a migrant economy, to a maize exporting region in the 1980's prior to market liberalisation. There is now concern that the regional economy is regressing and the region is becoming poorer with the main economic activity the supply of migrant labour (Bryceson, 1999).

An alternative to the pessimistic view that maize producing remote areas' comparative advantage lies in extensification of subsistence maize production and the socially damaging supply of migrant labour is to look for comparative advantage elsewhere. Delgado (1997) suggests that an important source of growth in rural economies in the future will be diversification into production of higher value horticultural and animal protein products as urban incomes and demand for these products rise. While a high value to weight ratio compared with maize might suggest that it would be more economic to transport them longer distances to market, there are serious questions regarding remote areas' potential comparative advantage in production and marketing of these commodities. First, their perishability means that they may require special and more costly transport facilities. Associated with this, there are significant risks associated with poor roads and lack of maintenance facilities in remote areas. There are also important informational requirements for initial investment into the production and marketing of these products, and for ongoing supply into markets that often have high quality requirements and short term local variations in supply and demand, requiring close liaison with urban buyers wholesale⁸. Finally, expanded horticultural and animal production for urban markets often requires relatively sophisticated management and use of inputs and services (for example crop protection chemicals or veterinary services and drugs) not traditionally available in remote areas⁹. If diversification into horticultural and animal protein production are not a likely way forward for remote areas, there may still be other diversification options, for example high value crops. Alternatively, as an alternative to extensification of maize production, there may be potential for more intensive production systems low external inputs. However, any of these options require farmers' to access output markets, and would benefit from improved access to input markets. These issues may be addressed either by investment in transport and communications infrastructure (effectively aiming to directly reduce the remoteness of an area), or by investment to reduce transaction costs in market involvement for farmers and traders. While investment in communications infrastructure such as roads may offer the greatest benefits, it is also extremely costly. In the remainder of this paper we therefore focus on more local and low cost approaches to reducing transaction costs to improve market access. The costs and benefits of these approaches may be compared with investment in infrastructure, but the different approaches are best seen as complementary, and policy makers should look for appropriate mixes.

In focussing on local means of reducing transaction costs to improve market access (focussing primarily on maize) we adopt an *ex-ante*, "operational" marketer's approach to the question of competitiveness, rather than assessment of comparative advantage. This approach involves:

1. examination of current and potential market demand for the product in question (in our case, maize grain and any derivative products);
2. assessment of the strength of competition in the market;
3. assessment of strengths and weaknesses of remote producers and marketers in order to decide
 - what improvements in market access are needed to take advantage of any identified market opportunities;
 - whether or not they can improve market access to take advantage of any identified market opportunities;

⁸ See Moustier (1996) for an example of problems faced by more remote horticultural producers serving the Brazzaville market.

⁹ There is, of course, scope in some areas for extensive livestock production, for example as practiced by the Fulani in parts of West Africa, but this requires access to significant access to capital (Dercon and Krishnan) and for a variety of social, economic and technical/environmental reasons this is not likely to be able to replace smallholder maize production as a source of cash income for most smallholder farmers.

4. appraisal of expected returns on marketing activities, given current and expected future market prices and volumes, allowing for likely demand and competition.

In our case studies we focus particularly on the appraisal of budgets for maize production and for trading of maize: to examine the profitability of these activities at present, and then to explore the potential effects on farmers and traders of alternative means of improving market access. The partial budget analysis takes particular account of the issues raised in this paper of cash flow constraints and of the effects of information costs on turn over, returns to capital, and risk.

6. Alternative means of improving market access.

We have identified the principle factors affecting remote smallholders' access to maize markets as: production costs, producers' marketing costs (transport costs, information or transaction costs, and risk, determined by price and demand instability and risk aversion), and traders' costs (transport costs, costs of finance, information or transaction costs, and risk, determined by supply, price and demand instability and risk aversion). These costs are affected by both spatial and social dimensions of remoteness. We have also identified the principle effects of liberalisation on remote maize markets as increased transport costs, high price and demand instability, and limited trader activity. Table 6.1 lists the main marketing costs incurred by producers and traders, and then identifies separately for producers and traders the principal constraints affecting their marketing costs. Figure 6.1 tries to pull the various constraints on market access together into a simplified diagram showing the relationships between the major variables, and identifying the major options (boxed) for intervening to improve market access. The various links and feedback loops within the diagram illustrate the potential for both virtuous and vicious circles, the range of potential factors that may impede improved market access, and the potential for external factors to inhibit market development.

Table 6.1 Producers' and Traders' Marketing Costs and Constraints

	Producer	Trader
Transport costs	Local roads/ tracks Local transport services Means of transport Volumes marketed	Local/ feeder roads Trunk roads Means of transport Transport services Transport management Volumes traded
Information costs	Transport costs Volumes marketed Social networks: local Telephones/ mail Literacy	Transport costs Volumes traded Social networks: local, central Telephones/ mail Literacy
Storage costs	Access to storage facilities: volume, quality, cost Storage losses Access to finance	Access to storage facilities: volume, quality, cost Storage losses Access to finance
Crop Finance costs	N.A.	Access to finance: cost, conditions
Risk: volume	Trader demand	Local supply Government activities Central demand
Risk: price	Local supply Central supply/ demand, Information access	Local supply Central supply/ demand, Government activities Information access

We now briefly review the major options identified in figure 6.1 for intervening to improve market access.

6.1 *Improving Rural Transport*

Transport costs for agricultural commodities can be very high in developing countries and may make up a substantial part of marketing costs, which in turn make up a substantial proportion of final agricultural prices (Creightney, 1993). These costs are much higher than costs for transport over comparable distances in Asia (Hine, 1991; Hine *et al.*, 1997; Platteau, 1996). High transport costs and transport problems can also lead to other problems for farmers and traders. Transport delays, for example, may be particularly costly, leading to

- spoilage of produce that cannot be transported on time;
- capital and managerial time (traders' and farmers') being tied up longer than necessary in individual transactions, with resultant lower returns to that capital and time, and reduced income;
- greater uncertainty about price movements in central markets, and hence increased trader risks

High transport costs and poor transport facilities may also reduce competition between traders, acting as a barrier to entry that deters traders and transporters from entering remote areas.

As indicated in table 6.1, four main aspects of rural transport have received most attention in the literature: roads infrastructure, management of transport services, the availability of transport services, and means of transport. These are closely related to and dependent on each other, and also affect and are affected by the volume of demand for transport of people and of goods. We consider these aspects in turn.

6.1.1 *Transport infrastructure*

Road infrastructure is a topic that has received a large amount of attention in the literature and the benefits of improved infrastructure are widely recognised. The focus of this paper, however, is on the identification of other, cheaper means by which market access might be improved for remote maize farmers in the short-medium term, and we will therefore only review this topic briefly.

Lack of infrastructure is possibly the single most important constraint impeding higher levels of trading in remote rural areas and increased market access by smallholders. Roads are the most common physical infrastructure element, playing a major role in improving transportation by lowering transportation costs (Creightney, 1993). Good roads may lower input prices and/or increase outputs prices, improve the level and the efficiency of input use and facilitate diffusion of modern technology (Ahmed, 1993).

Poor road systems, inadequate in terms of their quality or extent, have far reaching effects in the economies of remote rural areas. Heggie (1995) estimates that each dollar saved on maintenance costs increases national vehicle operating costs by \$ 2-3, thereby increasing transport costs and raising net costs to the economy. Resultant high vehicle operating costs are then one factor leading to the under-utilisation of roads in sub Saharan Africa (Platteau, 1996) with predominant use by pedestrians.

Appropriate responses to address problems of road infrastructure need to be differentiated between those directed at construction and maintenance of trunk roads, feeder roads, and access within rural areas. There is a broad consensus that poor maintenance of all of these types of road is due to an inappropriate institutional framework for their management. Roads have been managed as a social service by governmental road agencies, with a lack of clear responsibilities, ineffective management and lack of accountability (Heggie, 1995). Public infrastructure agencies have also failed to develop a professional cadre of managers and technicians (World Bank, 1989).

Although the institutional forms and arrangements required for maintaining (and constructing) roads will differ according to the type of road, there is a common requirement for reform of institutions to increase user ownership, sustainable financing, clear responsibilities, and effective management (Heggie, 1995). Focusing on main roads will not solve the transport problems faced by farmers in remote rural areas and the improvement of infrastructure for local rural transport and for district feeder

roads can be very important to rural people. Riverson and Carapetis (1991) argue that more generally feeder roads satisfy only 5% of farmers' transport needs, so only a small proportion of total rural transport and personal mobility journeys would benefit from the extension of roads suitable for motor vehicles.

Key issues in the development of improved infrastructure for local rural transport are then the establishment of appropriate, local institutional arrangements for road construction and maintenance, prioritisation of different types of work, and choice of appropriate road construction and maintenance methodologies. These issues are closely related.

Associated with the issue of decentralisation and appropriate methods is the issue of prioritisation of different repair and construction tasks. It is commonly argued that as a general rule of thumb, rehabilitation should be preferred to new investment, and targeting maintenance of key roads is crucial (Jayne *et al.*, 1997). However not all share this view, especially when dealing with remote areas, where making villages accessible to vehicles can be very important. The replacement of a footpath by a vehicle track may offer farmers far greater benefits (in terms of improved access to markets and other services) than the more costly improvement of the same length of earth track to a good-quality gravel road (Hine, 1993). Many rural road programs have focused on upgrading existing access rather than providing completely new access to motorised transport although small-scale spot improvement to keep vehicle access open are probably the most effective measures that can be taken to improve accessibility and may have a much greater impact on agricultural production (Hine, 1993).

6.1.4 Management of Transport Services

We now turn to consider problems identified in the management of motorised transport services in sub Saharan Africa. A number of studies have found that transport costs (using trucks) are higher in Africa than in Asia (for example Hine *et al.*, 1991; Hine *et al.*, 1997; Platteau, 1996; Doyen, 1993).

Differences in costs between countries appear to be partly the result of different government tax and subsidy regimes (affecting vehicle and fuel prices) and partly the result of differences in operational efficiency, with greater efficiency in Pakistan due largely to more efficient institutional arrangements using freight agents and dealing with principal-agent problems in employing and supervising drivers. There may also be greater opportunities for economies in utilisation and in maintenance due to the greater density of population and of truck ownership and use in Pakistan and Indonesia. Transport costs in some sub Saharan African countries may also be inflated as a result of restrictive practices by transport unions. Interestingly, Hine *et al.* (1997) found that road quality was not considered to be worse in Tanzania than in the other two countries, but it should be noted that the study was concerned only with long distance (trunk road) transport costs, and not with local rural transporting. We might expect the differences in costs between Tanzania and the two Asian countries to be exacerbated under the conditions encountered for local transport in remote rural areas.

This analysis suggests several means by which transport costs in Africa might be reduced:

- Competition could be encouraged in the supply of vehicles and spare parts, restricting the use of exclusive dealerships and encouraging importation of cheap basic vehicles
- Transport services offered by formal or informal trucking associations, which restrict supply and share out existing demand through vehicle queuing at lorry parks could also be made more competitive.
- Competing freight forwarding agents could be encouraged to reduce empty trips and increase utilisation.
- Institutional mechanisms might be developed to give drivers greater incentives to drive slowly and more carefully, paying close attention to fuel economy and maintenance costs.
- Reduced transport costs might promote greater transport volumes, and these might in turn encourage further reductions in transport costs.

It should, however, also be noted that most information available about transport costs in sub Saharan Africa has been concerned with long distance freight. There seems to be less information available on the costs of transport services for shorter, local or district trips in rural areas.

6.1.3 Availability of Public Transport Services

Transport services are often unreliable and infrequent in rural areas, with limited or no public bus services and only a few, expensive, trucks to hire, resulting in roads being mainly used by pedestrians (Riverson and Carapetis, 1991). Poor development of private sector services can be explained partly by the poor state of rural roads and high costs of running transport as discussed above, but the development of these services has also been inhibited by various constraints imposed by the state or by its agents. These include barriers to entry such as licensing regulations and the exclusion of private operators from certain markets (passengers, commodities), controls on traffic and on movement of people and goods (with the need for permits and passage through road blocks), and restrictions on fares. The combined effects of liberalisation and deregulation on some transport services have been dramatic in many countries, with rapid growth of private mini-bus services serving urban commuters and long distance routes. However costs remain high, with uncertain demand and more scope for administrative interference in rural areas, and these all deter private sector operators from providing services in rural areas.

Possible means of addressing these problems are to support the development of private sector services, and this might need some element of subsidy, improved terms for the purchase of vehicles and spares (for example improved credit facilities or reduced import tariffs). There are, however, severe targeting and budgetary difficulties involved in most of these schemes which undermine their sustainability. It is, however, clear that private operators should be able to set their own fares (Dawson and Barwell, 1993), although it may be necessary to prevent the development of cartels.

Village co-operatives or associations may also be encouraged to purchase their own vehicles and provide these services as an alternative to private sector operators, but such groups will generally require substantial support in training in management, operation and maintenance of vehicles, as well as credit, and past experience with group ownership in such schemes has not been particularly encouraging (Stringfellow *et al.*, 1996). Central government transport services have also often proved inefficient and unsustainable.

6.1.4 Appropriate Means of Transport

There is a growing recognition that in the past, planning for rural transport has not given adequate attention to transport services in rural areas and there has been an over-preoccupation with low-frequency, large volume, long distance high speed transportation. This has led to neglect of the real transport problems of rural populations, their need to regularly transport small volumes over short distances at a low speed and with no cash expenses (Riverson and Carapetis, 1991; Dawson and Barwell, 1993). At the same time, it is also recognised that there are important synergies between motorised transport services on feeder roads and rural roads on the one hand and non-motorised off-road transport, each amplifying the economic and social impact of the other: minor investments in off-road transport and infrastructure could be reflected in significantly greater motorised use of feeder roads. These considerations have led to increasing interest in recent years in 'intermediate means of transport' (IMT). IMTs include wheelbarrows, handcarts, bicycles (with or without trailers), animal drawn carts or sledges, mobyettes and boats. The potential for IMT's to improve accessibility in remote areas will be addressed in more detail by Gina Porter's paper to the workshop.

6.1.5 Transport: Conclusions

The focus of this paper is the identification of predominantly local innovations that will reduce marketing costs, and improve market reliability and access. A variety of local actions may reduce transport constraints and costs. These are likely to complement larger scale investments in feeder and trunk roads rehabilitation/ construction and maintenance. These local innovations may include community action to improve critical points in tracks or roads which prevent motorised or other vehicular access at critical times of year, institutional innovations at local and district level to support such community action, initiatives to improve the management of motorised transport (perhaps through institutional innovation and training to encourage greater driver care for efficiency and care of vehicles or more efficient vehicle utilisation), and greater ownership and hiring of intermediate means of transport. Such innovations are likely to be complementary, and priorities will vary according to local conditions.

6.2 *Improving Maize Storage*

One of the effects of liberalisation has been increased price variation and instability. Post liberalised maize prices vary spatially and temporally. Temporal variation is both intra-seasonal and inter-seasonal. Where there is intra-seasonal variation, with low prices at harvest and immediately after, followed by a period of increasing prices, then farmers and traders have greater possibilities of increasing their earnings by storage of grain, in order to sell it when prices are high. Of course widespread storage tends to reduce the extent of intra-seasonal price variation. Increased spatial variations together with intra-seasonal fluctuations in maize prices may also encourage more on-farm storage for own consumption, as differentials between harvest sales price and later purchase prices may increase where maize is transported out from and then back into remoter areas. Post-liberalisation uncertainty about farmers' maize grain sales in remote areas (arising from uncertainty about when a trader or traders will come to the village to buy) also demands 'involuntary' storage by farmers, who may be forced to keep maize for an indefinite period until a trader or traders arrive to buy their grain.

We may identify four constraints affecting farmers' and traders' storage of maize: low or uncertain returns from storage, access to storage facilities and their cost, physical losses in storage, and access to and costs of finance for working capital while the grain is in store. These are clearly inter-related.

6.2.1 *Returns from storage*

The gross returns from storage depend largely on the differential between harvest and post-harvest prices (ignoring for the moment the effects of storage losses). To make commercial storage of maize financially attractive for farmers or traders, the differential has to be both sufficient to cover costs (allowing for some profit and return to risk) and reliable, occurring with some degree of certainty year after year¹⁰. Whereas pricing incentives prior to liberalisation favoured a rapid grain sale (Jones, 1998), there is now widespread evidence in sub-Saharan Africa of substantial intra-seasonal maize price variation. This situation is not, however, universal, and in many countries differentials may not be large enough or reliable enough to make storage sufficiently attractive for many traders to engage in it. Maize prices in Ghana in 1998 and 1999, for example, have shown reduced intra-seasonal variation. This may in part be due to falling world prices and to increased storage by farmers and traders damping price variation, but the result is that many farmers and traders engaging in storage for the first time have had their fingers burnt. This is a salutary story for any attempts to increase on farm or trader storage on a wide scale, and stresses the need for appropriate market information and recognition of risks when undertaking investments in storage.

6.2.2 *Access to and cost of storage facilities*

Evidence in the literature on the availability and costs of storage facilities for traders is mixed. Traders may use their own storage facilities or hire facilities from others and it is not possible to draw any general conclusions about the availability of storage facilities for traders. Traders' access to storage facilities needs to be considered with regard to the scale, location and quality of storage facilities required by different types of traders, and in the context of other constraints to storage: if current demand for storage facilities is generally limited because of traders' lack of access to capital, for example, then access to appropriate facilities may become a constraint in the future if traders' access to capital increases.

Similar considerations apply to examination of farmers' access to storage facilities. Producers usually have storage facilities, but their quality and effectiveness in limiting storage losses is very variable.

6.2.3 *Physical losses in storage*

Storage (or for producers, post-harvest) losses affect both the quantity of maize available for sale at the end of the storage period and quality and hence price of grain (Adams and Harman, 1977, Dadi *et al.*, 1992). Over the last thirty years, however, the conventional wisdom on the importance of storage losses has swung from very high estimates of storage losses to much lower estimates, and these low estimates are now themselves being questioned.

¹⁰ Where farmers are storing for their own consumption risk aversion and consumption preferences (for particular varieties) may play a larger part, so that gross financial returns may not need to be so large to induce on farm storage.

Until the early 1970s, post-harvest losses (measured as percentage of weight loss) for maize were thought to be very important (more than 20%), and highly variable, with studies finding a range from 4-70% (De Lima, 1981). From the mid seventies, however, a more critical view was taken of these findings. It was recognised that there are considerable methodological problems in estimating post-harvest losses (Adams and Harman, 1977; Golob, 1981; De Lima, 1979) and that storage losses were much lower than had previously been thought. By the early eighties the broad consensus was that losses were in the magnitude of a 1-5 percent over the storage season, depending on climate, storage technique and assessment method used (De Lima, 1979; Golob, 1981; Tyler *et al.*, 1984; and Giga, 1991). Coulter and Golob conclude that "Storage losses should not be a constraint to prolonged storage and realisation of higher sale prices for maize" (Coulter and Golob, 1992 pp. 423).

More recently, however, concern has grown about post harvest and storage losses with the appearance of new post-harvest pests in Africa (such as the Large Grain Borer). Such pests are thought to cause losses five times greater than indigenous pests (Golob, 1996). Grain losses are recognised to be very variable, depending not only on storage techniques and length of storage, but also on the varieties of grain being stored (Golob, 1999).

In the storage of grain, three main variables may be used to manage the control of maize storage losses over time: control of general storage conditions, choice of maize variety, and the application of chemicals.

- General storage conditions are very important in controlling storage losses. High levels of infestation may occur when the granary is not properly emptied and cleaned before the new harvest is stored, and then it is important that during storage the moisture level of grain is kept low to reduce the incidence of post-harvest pests such as fungi and insects (Fiagan, 1994). Reduction in losses can be achieved by more rapid drying of maize, and by small modifications to existing models (Golob, 1984). Physical measures may also be taken to prevent access of rodents. Proper storage facilities are important, most obviously to keep grain dry.
- It is widely observed that grain from local varieties of maize usually stores better than grain from improved or high yielding varieties which may suffer from high losses (more than 20%) if left untreated (Golob, 1984). The yield differential between 'improved' dent maize varieties and local varieties can be significantly eroded by higher storage and processing losses (Smale and Heisey, 1997).
- Chemical treatment of maize with appropriate insecticides can be an effective method of reducing the incidence of insect attack in flint or dent varieties (Bani, 1991; Giga *et al.*, 1991). The cost and effectiveness of such treatments vary with different chemicals. Dusts (such as Actellic) are generally the cheapest and easiest to apply, and are relatively safe because of their diluted formulation (Golob, 1984). Phosphine gas, on the other hand, is very effective when used in air-tight storage methods, but with the storage facilities commonly used by farmers and traders is both hazardous and ineffective, and therefore uneconomic (Golob *et al.*, 1996). This illustrates an important point, that the actual costs of chemicals are only a part of the costs incurred in their effective use. Thus most chemicals must be applied to shelled maize, as shelling decreases the quantity (and cost) of chemical that needs to be applied, improves its effectiveness and decreases the storage space required. However farmers rarely shell grain before storage and resist shelling, mainly because it is a labour-intensive operation and it requires increased labour at a time when farmers can ill afford it, at and just after harvest (Fiagan, 1994; Rukuni, 1988).

For these reasons, and because chemical grain protectants tend to be expensive for the average smallholder, as well being unavailable in remote areas, many farmers use natural and more available insect repellent such as ash and sand and tobacco dust (Golob, 1984). In most cases producers simply do not apply any chemical protection. This situation may have been encouraged by the increased price variation, reduced parastatal market coverage and uncertainty about the private sector's presence that have resulted from market liberalisation. At the same time, reduced availability of improved seed and of chemical insecticide means that farmers are more likely to store local varieties without treating them, even if chemical treatment occurred previously.

Traders on the other hand, especially wholesalers, sometimes have to store large quantities of shelled improved maize, albeit for short periods. In these situations traders will often need to apply insecticides and it is important that they then have access not only to appropriate technical information and chemicals, but also to appropriate storage facilities, as discussed earlier, where chemical treatment will be both effective and safe.

6.2.4 Access to and costs of working capital

Both farmers and traders require working capital to finance the cost of maize held in storage, and it is widely recognised that working capital is a major constraint affecting both on and off farm storage of maize. Farmers may need to sell grain quickly to raise cash to pay off debts incurred before harvest (for consumption or in the purchase of inputs), and as a result they may obtain very low prices.

Constraints on traders' access to finance is a problem that affects not only their ability to store grain, but also their ability to engage in maize purchasing at all. We will be discussing this as a general constraint later, but note here that traders do face difficulties in balancing their use of capital for purchase and storage, and often prefer to use what capital they have to increase volumes traded rather than to trade smaller volumes of grain which they hold for longer periods.

6.2.5 Summary of constraints affecting storage

Market liberalisation appears to have increased the potential financial returns to storage by farmers and traders, as intra-seasonal price variation has increased. However, most traders do not store for more than a short period of time, usually a few weeks. Farmers often store grain intended for their own consumption for longer periods, but may not undertake much storage of grain intended for sale. Uncertainty about when farmers can sell maize may also make shorter term demands for 'involuntary' on-farm storage of maize intended for sale. Constraints preventing more storage by both farmers and traders include uncertainty about the returns from storage, lack of storage facilities, physical storage losses, and lack of working capital. This last constraint is probably the most critical, but were increased working capital to become available, then problems with uncertainty about the returns from storage, and with storage facilities and physical losses are likely to become more common. These therefore need to be given proper consideration if measures are being planned to improve farmers' and traders' access to working capital.

6.3 *Trader finance*

Although traders are recognised to face a number of constraints that inhibit increased participation in cereal marketing, especially in remote areas, access to finance is reported by many authors to be the most important one, and where they face other problems such as lack of competitive transport services, poor market information and administrative difficulties, these are often compounded by and compound their problems of limited access to capital. Limited access to capital may prevent new traders from entering markets (and thus limit competition between existing traders in these markets), prevent traders from expanding their activities (again limiting competition), and cause inefficiencies in the way that traders are forced to manage their activities in order to overcome credit constraints.

Traders may access capital from formal or informal sources, but it appears that even larger traders have difficulties accessing capital from formal sources. Earmarked funds for trader credit then remain untouched as formal financial institutions do not issue loans that do not meet their formal requirements for loan guarantees (Jones, 1998). Smaller traders tend to be completely dependent on informal sources, Golob *et al.* (1996) report common practice in northern Ghana for producers to supply resident village-level traders on credit. In these circumstances a new trader does not have to accumulate large amounts of capital to begin trading and credit constraints *per se* were not a barrier to entry, provided that there was a relationship of trust between the trader and farmers, with farmers confident that local institutions would ensure their repayment by the trader. However reliance on such credit is likely to limit expansion of traders' activities outside their own village (and even within the village), and also to lead to an emphasis on rapid turnover to allow rapid repayment to farmers.

Lack of working capital leads to traders engaging in trading activities on a small scale and with rapid turn-over. Use of personal capital means that demands for capital for trading activities have to be managed with demands for personal consumption and social needs (Mehta, 1989). Inefficiencies arise when traders' businesses cannot grow to take advantage of economies of scale and scope (Coulter and Golob, 1992) or when capital shortages limit competition in particular markets, for example Jayne *et al.* (1997) describe how small traders who have to wait to secure transport after buying maize have their capital tied up in their inventory and a larger trader can then temporarily exert greater influence over the market.

Traders' access to credit may vary with gender. Women often have more limited rights to ownership of land and of other property that may be used as collateral in obtaining larger and more formal loans. Informal sources of credit depend very heavily on particular social relationships. Although men often have social relationships and status that make it easier for them to obtain credit, women traders may also establish ROSCAs and other informal savings mechanisms, or traders' associations may also be effective sources of credit.

6.4 *Market Coordination*

In this section we review briefly the main institutional issues directly affecting farmers' and traders transaction costs and market risks, focusing on the organisation of markets, farmer organisations, and the actions of governments. This discussion of the effects of farmers' and traders transaction costs and market risks on market access relates to the more theoretical discussion earlier where it was shown that transaction costs and the risks of loss in transactions are important costs affecting traders and farmers and they may cause market failure and lack of access to markets for remote producers.

Market institutions, which we shall define here in terms of the rules and mechanisms governing the operation of markets, have a critical effect on transaction costs and on the risks of loss in transactions. They affect:

- the availability of information to buyers and sellers;
- the costs of acquiring information about prices, about supply or demand, and about potential buyers or sellers;
- the costs of making and enforcing contracts (and the risks of non-compliance);
- the size of transactions (and since transaction costs tend to be related to the transaction rather than the scale of transaction, they also affect the average transaction cost per kg, bag or tonne of grain exchanged).

6.4.1 The organisation of markets

We may discuss the organisation of markets both in terms of their structure (for example describing the number of traders and their inter-relationships with each others in the marketing chain from producer to consumer) or in terms of their spatial and temporal organisation.

It is difficult to make many generalised statements about market structure for liberalised maize markets in sub-Saharan Africa, as there is considerable diversity both between and within countries. Production in remote areas is normally by large numbers of small-scale producers, who sell either directly to local consumers or to a range of intermediary traders. These intermediaries in turn eventually sell to consumers in local, district or major central markets. The number of traders, their size and the extent of competition vary markedly between countries. Different categories of traders vary in their access to market information, capital and transport and in their relationships with buyers and sellers. These in turn affect transaction and transport costs. In general, we may expect centrally based traders to trade in larger volumes, have better access to capital, and have better relationships with and better information about central markets. Conversely, we may expect rural traders to have weaker information about and relationships with central markets, and limited access to capital, but much better information about and relationships with farmers. The challenge for traders is to establish a range of relationships that provide access to information, capital and grain supplies, together with entry into central markets. Poulton *et al.* (1998) refer to the need to develop systems that provide a capital - information nexus for traders to access these markets simultaneously, since firms or individuals with access to formal credit markets are often removed from rural areas and lack local market information, whereas rural traders with this information often lack access to capital markets.

The nature of rural and district centre market organisation also varies with the relative reliance on direct personal relationships between buyers and sellers on the one hand and on use of market days at specific sites to bring together buyers and sellers on the other. It is not clear why the tradition of rural periodic markets has developed particularly in West Africa (Papadopoulos 1996). However, it is notable that there has been less government intervention in these markets, especially in cereals markets, than in other parts of Africa, along with much greater women's participation in the marketing of agricultural products. Northern Ghana has an extensive network of markets, held periodically. Golob *et al.* (1996) report that 94% of villages are within 10 km of a market and 54% of villagers sell at a market. It appears that even remote areas can still enjoy such a marketing system. These local markets provide producers from neighbouring villages with regular trading opportunities and market information and they also provide traders with opportunities to gain market information and to contact and buy from large numbers of producers. They can thus significantly reduce transaction costs for both producers and traders. However, they require producers and traders to travel to these markets with produce or cash, and both sets of market participants must be assured that there will be sufficient trading volumes and activities to make their trip worth while. Thus farmers must be satisfied that there will be sufficient traders and trader interest for them to obtain competitive prices for their produce, and traders must be satisfied that there will be sufficient volumes of grain offered for sale by farmers.

The tradition of local markets appears to be less well developed in Eastern and Southern Africa, with greater reliance on bilateral exchange between traders and farmers, either through ongoing relationships between particular traders and farmers or fairly *ad hoc* contacts between traders and farmers for one-off, spot market transactions.

An important role of markets is to provide buyers and sellers with information about prices and about supply and demand, and to provide channels of communication between buyers and sellers. Futures markets allow farmers and traders both to gain information about future grain prices and to manage risk associated with variation in grain prices. Commodity exchanges, which offer forward as well as spot market contracts, have recently begun to function in countries such as South Africa, Kenya and Zimbabwe and are producing useful market information (Jayne and Jones, 1997). However Howard (1997) argues that in Zambia there is little incentive for sellers to go for forward contracting of maize as prices are too volatile. Smallholders in these countries rarely have access to the commodity exchanges, which are used by large, commercial farms. Minimum transaction sizes and the high transaction costs of dealing on the exchanges mean that smallholders would have to market in groups before dealing on an exchange was worthwhile.

There may, however, be a role for forward contracts in reducing the market risks faced by smallholder farmers in remote areas in liberalised grain markets. In many countries smallholders still yearn for the

(reasonably) stable demand that characterised the single-channel marketing system. If traders were to offer smallholders forward contracts for their harvested maize grain, this would enable them to plan their production activities and apply purchased inputs with a much lower degree of risk than is currently the case. Currently forward contracts are rarely entered into unless a trader has supplied inputs to a farmer on credit. Here there is often a contract enforcement problem if the farmer can sell his output to another trader, thereby avoiding loan repayment. With such interlocked contracts, the forward price signals may also be confused (if the harvest price is set at the time that the contract is agreed) by the bundling of input pricing and implicit interest payments into the one contract. Non-linked forward contracts would provide much clearer information on the premia that farmers had to pay in order to secure themselves against market and price risks. However, there might still be a contract enforcement problem if the agreed price turned out to be much lower than the prevailing market price at harvest time. Conversely, traders might be tempted to renege on their agreement or simply not turn up to purchase the output if the market price turned out to be much higher than that agreed earlier in the season. Traders are only likely to offer such contracts when, by doing so, they can obtain a claim on maize grain in a competitive, sellers' market. However, these are exactly the conditions that favour farmers reneging on contracts that they decide are unfavourable *ex-post*.

6.4.2 Farmers' marketing organisations

The establishment of farmers' marketing organisations offers farmers a number of potential benefits (Chirwa, 1998; Coulter and Golob, 1992; Jayne and Jones, 1997; Riverson and Carapetis, 1991):

- Farmers (and traders) may benefit from economies of scale in transport and transaction costs as a result of larger traded quantities per transaction.
- Farmers may engage in more stable (less risky) relationships with suppliers or traders.
- Farmers may be able to attract larger, inter-regional traders, who are willing both to offer a better price than local middle-men and to provide farmers with better market information.
- Marketing organisations may be able to reduce transaction costs in input and credit disbursement and increase loan repayment rates.
- Groups can also increase farmers' bargaining power against traders.

Incentives for groups to bulk up agricultural output and distribute inputs is strongest where opportunities for marketing on an individual basis is limited, such as in remote areas (Stringfellow *et al.*, 1998; Jayne and Jones, 1997).

Group activity to bulk up agricultural output raises the question of collective storage activity. Coulter and Golob (1992) advise that, unless there are clear reasons for it, farmer groups should not generally store at village level, because grain can be effectively and cheaply stored by farmers, whereas past experiments with village stores in Tanzania were plagued by high losses. Moreover, farmers are generally unwilling to entrust their own grain to a village/co-operative store, for fear of loss, theft or deterioration (Coulter and Golob, 1992). However if all farmers are to bring their grain to a local assembly point for a trader to collect on a specific day, there are potential problems of co-ordination. These can only be resolved by adequate communication between farmer groups and traders, together with strong coordination and commitment within the farmer group to ensure that farmers do bring their produce on the appointed day, and strong commitment by the trader to come and buy as agreed.

Another activity that is currently popular with donors and NGOs in Ghana and elsewhere is the provision of inventory credit to farmers after harvest. A prerequisite for the sustainability of such schemes is that the banks have confidence in the management of the stored grain, which represents the collateral guaranteeing their loans and this normally involves donors or NGOs taking responsibility for storage. Farmers must also be able to access information on expected movements in the market price of grain, to make informed decisions as to when to sell their stocks. Problems with lower than expected price movements in Ghana in 1998/99 have already been noted. One solution to both of the problems mentioned above would be the commercial provision of low-cost, small-scale storage services with marketing advice also provided as part of the package of services to farmers (J.Coulter, pers.com.). If speculative storage is indeed a profitable venture, farmers should be able to pay for competitive, commercial services of this nature. However, in many countries of Sub-Saharan Africa it is unclear who might emerge with the bundle of attributes required to offer the services in question.

Stringfellow *et al.* (1996), in a review of experience with farmers-controlled enterprises (including marketing groups), found that successful groups bring tangible benefits to members, steadily increase in membership and are internally democratic. They tend to have relatively homogeneous membership; are built on long standing, often indigenous, pre-existing organisations and co-operative tradition; have both financial and social objectives; contain effective structures of accountability; maintain financial transparency and keep proper records. A major difficulty with group marketing activities, however, is the long term sustainability of the groups. Stringfellow *et al.* (1996) found that many groups that provided effective services to members were supported by heavy external training in the early stages. However, many groups formed with external assistance do not survive after external assistance is withdrawn.

Where farmer groups have been established by outside intervention without a basis in pre-existing organisations or very careful "animation" work by trainers, they have tended to be poorly managed, to provide few benefits to members, to lack financial viability, and to lose their members. In Tanzania, for example, there is a long tradition of cooperative activity supported by the state and, outside coffee growing areas, cooperatives have largely failed to bring farmers benefits. In the liberalised marketing environment of the 1990s, Tanzanian cooperatives have largely collapsed. Coulter and Golob (1992) report that farmers had a passive attitude towards maize marketing, and that they did not appear to have considered organising themselves to get a higher price for their harvest. Farmers were much more concerned by the provision of inputs, notably fertiliser and seed. Stringfellow *et al.* (1996) point to some successes (not so much in grain marketing) where the establishment of links between farmer groups and commercial private sector organisations has been successful, and they suggest that this approach may be more sustainable than the establishment of groups which attempt to take on complex marketing and processing activities themselves.

6.4.3 State intervention: institutional effects

It was noted earlier that transaction costs are affected by both institutional arrangements and the institutional environment. Discussion above of market days and farmers' marketing organisations was concerned largely with the institutional arrangements between farmers and traders. We now turn to consider the role of the state in affecting the institutional environment within which these institutional arrangements operate. In broad terms, the legal and political framework for market activities has major effects on transaction costs and risks for traders and farmers. Governments can reduce these costs and risks by establishing and supporting stable macro economic policies and clear property rights¹¹. On the other hand governments can increase these costs and risks by intervening in unpredictable ways with direct or indirect taxes, unstable macroeconomic policies, and by allowing corrupt, rent seeking activities by officials (Dorward *et al.*, 1998b; Jayne *et al.*, 1997; Seppala, 1998).

Government actions directly affecting the institutional environment and property rights of traders and farmers can be separated into general legal and economic policies affecting business on the one hand, and regulations affecting specific types of economic activity on the other.

General legal and economic policies reducing transaction costs and risks will be concerned, for example, with the control of inflation, general taxation, laws governing government expropriation of private property, protection against political interference and the existence or otherwise of direct controls on prices¹². Governments need not only to implement clear and stable policies, but to be seen to do so and to signal their commitment to continue to do so in future, so that private investors will develop confidence. This is an important issue affecting the development of private sector trading activity following market liberalisation. With the removal of state intervention and control private traders have been encouraged to step in to cereal markets, but the conditions of trust and stability that traders need before they invest in these markets takes time to develop. In the meantime political pressures, plus mistakes and problems encountered during liberalisation, have often meant that liberalisation has not been undertaken in a consistent fashion. As a result, the institutional environment

¹¹ Government action to promote investments in communications infrastructure (such as roads or telephones, for example) also affects the institutional environment, but we will concentrate here on institutional activities affecting the institutional environment more directly.

¹² If controls are retained, there should be clear and consistent rules about when and how such controls will be implemented and operated

has not been as clear and stable as private investors would wish before they start to make significant investments.

Jones (1998) that in many countries the legal status of trading is still uncertain and few people know about the consequences of judicial reforms. Information on legal changes affecting trading, and their consequences, should be widely disseminated to increase traders' confidence and willingness to invest and to reduce the ability of officials to extort bribes.

Turning to administrative restrictions, the commercial response to market liberalisation has sometimes been disappointing because of the inhibiting regulations remaining from the period of restricted trading, with a web of controls relating to licensing, trading hours, transportation services and movements of goods (Donovan, 1996; Badiane, 1998). We can identify two broad categories of regulations affecting grain trading:

- administrative restrictions such as licensing requirements for, and quotas on, grain purchase and movement;
- taxes on these same marketing activities.

Increasingly, central governments are abandoning the former, although they are still often imposed by local administrations. Reform of national tax collection agencies may in the next few years make traders more likely to have to pay tax on their incomes or profits. It remains to be seen how transparent the process of assessment and collection is. Meanwhile, traders often remain liable to a plethora of local taxes and levies. It is, therefore, the issue of local regulations and restrictions affecting grain trading on which we shall concentrate.

Local licensing requirements and taxes are often imperfectly enforced, whilst traders have to endure delays and bureaucracy and often have to pay bribes in order to register and obtain a license (World Bank, 1989). Meanwhile, local administrations are barely accountable for the sums raised. Resource-strapped local administrations often resort to road blocks to enforce their regulations and to ensure payment of local levies and taxes. However, more often than not road blocks provide officials and police with opportunities to extract unofficial taxes or bribes. In general terms, both road blocks and administrative restrictions that are not imposed and enforced in a predictable and transparent manner raise marketing costs, increase risk and discourage trade. They also act as barriers to entry to new traders and reward traders "who know how to play the game rather than those who know market conditions" (Abdulwahid, 1995, pp. 230).

It seems clear that one of the advantages of market liberalisation has been a reduction in some of the worst excesses of government or official action that increased transaction costs and risks in trading. However, local restrictions on trading are, at best, taking a long time to be controlled and, at worst, are threatening to multiply even whilst at macro level the institutional environment continues to improve.

The current trend towards bureaucratic decentralisation may make the problem of local administrative restrictions on grain trading worse before it gets better. As local governments are given more powers and responsibilities, without adequate resources, they are likely to be tempted to impose yet more taxes and levies. Moreover, democratic (and other forms of) accountability for their actions is likely to take some time to develop. Therefore, practices that benefit individuals within the administrations concerned more than the people they are supposed to be serving may take years to bring under control.

The discussion so far has cast most regulations as burdensome and has, therefore, presented their removal as a desirable step to reduce the costs of trading (and eliminate its hidden costs). In fact, what is required is fairness, transparency, predictability and accountability in setting and enforcing regulations. After all, the state does have a legitimate role in supervising and regulating markets (Christiansen and Stackhouse, 1989) and the development of a marketing system that is competitive requires a regulatory framework to define property rights and promote contract enforceability in order to reduce transaction costs and risks. Thus paradoxically while liberalisation requires the removal of administrative regulations and corrupt practices that inhibit trade, it may also require the introduction of some controls which had not existed before (Jones, 1998). Similarly, governments may still impose taxes to raise revenue. The problem is that these new controls and taxes may themselves be exploited for personal gain by corrupt officials, and may be counter-productive in introducing uncertainty for traders.

One area where governments may have an important role to play in liberalised markets is in the standardisation of weights and measures. Bag weights, for example, may vary enormously, depending on the age of bags, the range of different bags used, and techniques for filling and sewing. The lack of transparency will often work in favour of the trader where farmers have limited trader outlets. Another area where governments may have a role in improving the institutional environment is in the provision of market information. Some surveys (e.g. Mehta, 1989; Seppala, 1998) have found that the most frequent source of market information for traders are other traders. Farmers regularly rely on neighbours returning from a market to obtain price information. There is, however, some evidence that information on grain prices regularly disseminated through mass media channels by public market information services (MISs) can improve the efficiency of grain marketing systems and bring other equity benefits. MISs can also assist small or newly established traders, who do not have access to existing trader information networks (Shepherd, 1997a) and may constitute important sources of information for traders from neighbouring countries wishing to engage in cross-border trade, who are unlikely to have the same access to informal sources of information on domestic market conditions as indigenous traders (Shepherd, 1997b). However, overall experience of MIS is very disappointing, as they tend to be unsustainable and all too often fail to provide commercially useful information for farmers and traders (Shepherd 1997a, p4). This may be due to poor quality information, because farmers are committed to interlocking contracts with traders providing them with pre-seasonal credit, or because of farmers' insufficient knowledge of, ability to exploit, alternative marketing channels (Galtier and Egg, 1998).

6.5 Addressing socio-economic constraints on market access

In this section, we examine socio-economic factors which may constrain access to maize marketing opportunities by affecting particular groups' or individuals' access to information, transport, storage and credit facilities and services. We focus our attention on problems associated with inter- and intra-household differentiation in access to and control of resources and in vulnerability. It is important to recognise here that improving market access is likely to carry risks for some disadvantaged groups. We identify six areas of concern.

6.5.1 Increasing local maize prices and the cost of food for poorer maize deficit groups

The possibility of improvements in a region's wider market access leading to higher local market prices is apparent from figure 2. If improved market access is achieved largely by a fall in traders' marketing costs, this will cause a rise in D_r , which may lead to a rise in local prices. If, however, improvements in market access are achieved by falls in producers' costs, this will push out the supply curve S_r and may result in lower local prices¹³. The effects of improved market access on local prices and hence on poorer, maize deficit and maize purchasing groups are therefore likely to depend upon initial local supply and demand for maize, and on the balance between the effects of reducing traders' marketing costs and increased demand on the one hand, and the effects of reduced producers' costs and expanded local supply on the other.

6.5.2 Decreasing seasonal maize availability in local rural markets

If improved market access leads to farmers selling more maize out of a remote area then the fear may arise that, as a season progresses, maize supplies within the area will fall below the levels that existed without trade. Following this line of reasoning, poorer groups may either not be able to buy grain because it is not available locally or may face higher prices because of local shortages and/or because grain then has to be re-imported from the central market. In reality, absolute shortages are unlikely. Where improved market access leads to increased maize sales out of an area, there are also likely to be mechanisms for its import. Whilst the second scenario is conceivable, it is also the case that improved market access due to lower trader costs will make the later importation of maize cheaper and more profitable for traders, thus to some extent countering the negative impact of greater dependence on imported supplies. Overall, though not necessarily for individual households, improved market access allowing greater trade should lower the seasonal variation in local market supply and in prices.

¹³ This assumes that demand for local production in wider markets is not totally elastic (i.e. a different assumption from that made in figure 2).

6.5.3 Increasing demands for labour from disadvantaged groups without proper recompense

Financial incentives for increased maize production as a cash crop may not only make maize more expensive to obtain for particular disadvantaged groups, but it may also stimulate demand for their labour. This may have beneficial effects for individuals or households who are short of land or capital and rely on hiring out their labour for income. However, female labour being largely controlled by men, women are often required to increase the labour they supply to cash crop activities on their husbands' fields, without any extra benefits or remuneration for their labour, adding more tasks and a greater burden of work to the multiple roles that women are expected to play (Swantz 1985; Cornia et al, 1987). Women's understandable reluctance to work on such terms may reduce the production response to improved market access. More importantly, there may also be detrimental effects on women's (and children's) welfare, as the extra maize is produced for exchange on world markets rather than for subsistence and women's involvement in food crop production for subsistence is actually reduced (Omari, 1989). At another level, it means that women are not able to control the end results of their labour when the produce is sold to the market. Women may then engage in parallel (informal) markets in order to control their products at market level (Omari, 1989).

6.5.4 Encouraging more wealthy and powerful groups to expropriate resources

If maize production and sale becomes a profitable activity, then more powerful individuals and households may expropriate resources from others to use in their own maize production. Expropriation of women's labour, considered above, may be considered a special example of this. Land may also be expropriated, with more wealthy households extending cultivation to include land that previously was available with communal access for fuelwood, grazing and gathering of fruit and leaves, or male members of households taking over land that was being cultivated by females. Special facilities (such as credit facilities or market services) offered to 'remote' groups may also be subverted for use by more powerful 'less remote' groups.

6.5.5 Risks of environmental damage.

Increased market access that stimulates maize production also carries with it risks of environmental damage (with loss of soil fertility, erosion, etc.) if maize production is extended onto marginal land or changes the balance between production and fallow in crop rotations without adequate attention being paid to maintaining soil fertility.

6.5.6 Development of non-competitive market relations and trader monopsony power

Finally, as noted earlier improved market access may, in specific cases, involve the development of non-competitive market relations. This is possible where an area emerges from near autarky into still very limited trade - and the non-competitive relationship may be necessary even to encourage this limited trade. It is far more likely that improved market access will lead to greater competition in a given area. Nevertheless, where a trader holds a monopsony, or where traders form a cartel, standard economic theory suggests that they may limit their purchases to gain monopsony profits from lower prices paid to farmers. Farmers then lose out from lower prices received for lower quantities sold. Farmers may also become embroiled in long term relationships where they are locked into to debt.

These risks to disadvantaged groups need to be recognised when considering the potential effects of improved market access for remote groups, and when planning and implementing any of the interventions discussed earlier, to ensure that such interventions are designed and introduced in such a way as to minimise the risks of these negative impacts occurring. In some situations this will not be easy.

The sustainable rural livelihoods framework (Carney, 1998) may be helpful in bringing these issues together, with consideration of the interaction of households' different forms of capital assets with their vulnerability and the 'transforming structures and processes' of the institutional environment that have been the focus of this paper's discussion of means of improving market access.

7 Conclusions

To summarise, we have argued that:

- In remote areas and for 'remote' social groups, input costs, transformation costs, transaction costs and risks associated with low volume marketing activity are higher than in more accessible areas;
- Risk costs are generally higher for vulnerable households and female farmers as a result of (a) relatively restricted access to information and (b) greater risk aversion;
- Some groups are too remote and disadvantaged to be assisted by improved access to maize markets. Other groups may only benefit indirectly through impacts on labour markets or even risk being disadvantaged by improved market access for others.
- There are both economic efficiency and welfare arguments supporting policies and interventions that focus on improving market access for remote farmers, where remoteness may be defined according to spatial, informational or socio-economic dimensions ;
- Such interventions are likely to be most effective and efficient if they focus on particular marketing costs that are high for remote farmers or for traders dealing with these farmers;
- There will be limits to the extent to which such interventions will be able to improve market access for the most remote farmers.
- There are risks of potentially negative impacts of improved market access for remote groups, and these risks need to be guarded against in the planning and implementation of support to improve market access for remote producers.
- Potential means of improving market access for remote maize farmers include
 - Appropriate national policies and central government investment in appropriate infrastructure development and maintenance in transport and communications, with an appropriate balance needed between direct government investment and national policies to promote private sector investment in main road construction and maintenance and in telephone systems.
 - Local action to make spot improvements to local roads and tracks and to improve maintenance.
 - Greater use of 'intermediate means of transport'.
 - Improved institutional arrangements in the management of trucking (for example improving driver incentives to economise on fuel and maintenance costs).
 - Improved access to storage facilities, finance and market information for farmers and traders
 - Improving traders' access to finance appears to be a critical aspect of improving producers' market access in many situations. A range of approaches may need to cater for the needs of different types of trader, ranging from local and small scale traders, often women, operating at the village level, to larger traders dealing with much larger quantities of grain over wider areas.
 - Institutional development is needed to improve information flows and trust so that there can be more effective coordination of, greater access to and more effective use of resources such as transport and finance.
 - There may be benefits from improvements in the operation of periodic local markets.
 - Traders' groups may be established, offering members benefits in terms of some coordination in transport hire and arrangements, access to finance, representation to local government, and market information.

- Farmer groups may offer members benefits in terms of lower marketing costs through economies of scale in assembly, transaction costs, transport costs and bargaining power with traders to improve prices. They may also be better placed to obtain credit.
- Improved relationships of trust between farmers and traders (and between different categories of traders) may reduce transaction and transport costs and risk and allow opportunities for farmers and traders to give and/or obtain credit. Trader and farmer relationships might also be developed to allow some form of forward contracts.
- There may be potential for improved or new institutional arrangements involving other agents, particularly local governments, with removal of regulations and restrictions that increase trading costs, promote corruption and inhibit trade. They should also support markets by being fair and consistent in their dealing with entrepreneurs. They may also have a role to play in supporting markets, for example by facilitating the establishment of local weekly markets, by facilitating the flow of market information, by enforcing standard weights and measures, or by supporting local initiatives in road improvement and maintenance.
- Institutional development is fraught with difficulties, as individuals often try to free ride and behave opportunistically for personal gain and lack a sense of group commitment, particularly as the benefits from group membership are often not great enough to support sufficient commitment for groups to be self-sustaining. Vulnerable individuals are also often excluded from functioning groups. The socio-economic constraints affecting different types of individual (identified by age, gender, ethnic group or wealth, for example) thus need to be recognised and identified, and special account needs to be taken of the constraints and opportunities facing particular vulnerable groups.

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