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Overcoming Market Constraints on Pro-Poor Agricultural Growth in Sub-Saharan Africa

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In sub-Saharan Africa, there is fairly broad agreement that increased investment in key public goods such as roads and communications infrastructure, agricultural research and water control will be required if revitalised agricultural development is to take place. However, it has proved more difficult to reach agreement on what needs to be done to improve the performance of agricultural markets. In this article we set out an agenda for investment and policy reform in this area, providing a brief theoretical examination of the co-ordination problems involved before examining in turn demand and supply constraints affecting smallholder farmers, and policies for price stabilisation and the co-ordination of support services. We also argue that increased attention needs to be paid to governance issues.

1 Introduction

Three main sets of arguments are advanced to explain the commonly observed disappointing supply response to agricultural market liberalisation in Africa (Kherallah et al., 2000):[1]

(i) The state still intervenes too much, or in too arbitrary a way, in markets to give the private sector confidence to make significant investments. Some interventions (for example, local taxes, restrictions on cross-border trade) also directly reduce the profitability of private sector trading activity and/or lower the prices ultimately received by producers.
(ii) Market liberalisation has coincided with a sharp decline in state budgets and hence in public investment in key public goods, such as research, extension and infrastructure.
(iii) With high transaction costs and risks in agricultural marketing (for input suppliers, producers, buyers and processors), there is a need for specific policy attention to improving co-ordination of market activities to overcome 'low-level equilibrium traps'.

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1. Here and in what follows, the term Africa is used to refer to sub-Saharan Africa.

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These explanations of continuing market failures in smallholder agriculture are largely complementary, but there is clear scope for disagreement as regards appropriate policy responses, in particular between proponents of views (i) and (iii) (Jayne et al., 2002), depending on how exactly view (i) is expressed.

While these views explain low agricultural productivity growth in terms of farmers' inability to access output markets and, with weak financial and input markets, their limited response to output market opportunities where these do occur, there is also evidence of demand constraints on agricultural growth (Diao et al., 2003); without increased demand for agricultural products and/or more efficient markets to distribute them, growth in agricultural productivity could quickly run into declining prices that counteract the benefits of productivity growth for producers and discourage investment. In what follows we examine the scope for African agricultural growth in the face of demand constraints, and then focus on the appropriate role of the state in stimulating African agricultural markets.[2] Before embarking on this, however, we first describe the basic co-ordination problems faced by the emerging supply chains in poor rural economies, and broad policy options for addressing these. This introduces important issues underlying this article's proposals for joined-up policies addressing a range of critical supply (or commodity) chain problems.

2 Conceptualising low-level equilibrium traps and broad policy responses in African agriculture

Agricultural intensification involves both technical change and the presence of input, seasonal finance and marketing systems to increase farm production and deliver it to consumers at a competitive price. Intensification therefore involves the development of supply chains around smallholder farmers,[3] with simultaneous and complementary investments in all links in the supply chain. Co-ordination, opportunism and rent-seeking costs and risks can, however, pose serious difficulties in the making of such simultaneous investments in poor rural areas. Unfortunately, the importance of these costs and risks has not been sufficiently recognised by theorists and policy analysts, nor has the contribution of pre-liberalisation policies in addressing them, though such policies supported very successful agricultural development in other parts of the world (particularly Asia) in the latter parts of the twentieth century.

2. When the initial version of this article was commissioned, additional papers on research, on extension and innovation and on transport and irrigation infrastructure were also commissioned to examine investment in key public goods in more depth. Such investment is extremely important if African agriculture is to fulfil its potential as a driver of growth and poverty reduction. However, we note that investment in infrastructure is likely to cost more, in budgetary terms, than the measures proposed here, whilst the returns to investment in infrastructure will be greatly reduced without the policy, process and governance measures proposed.
3. There is a large literature about the importance of smallholder agriculture in driving pro-poor growth, see for example Kydd et al. (2004) for a recent discussion.

2.1 Co-ordination problems in African smallholder farming

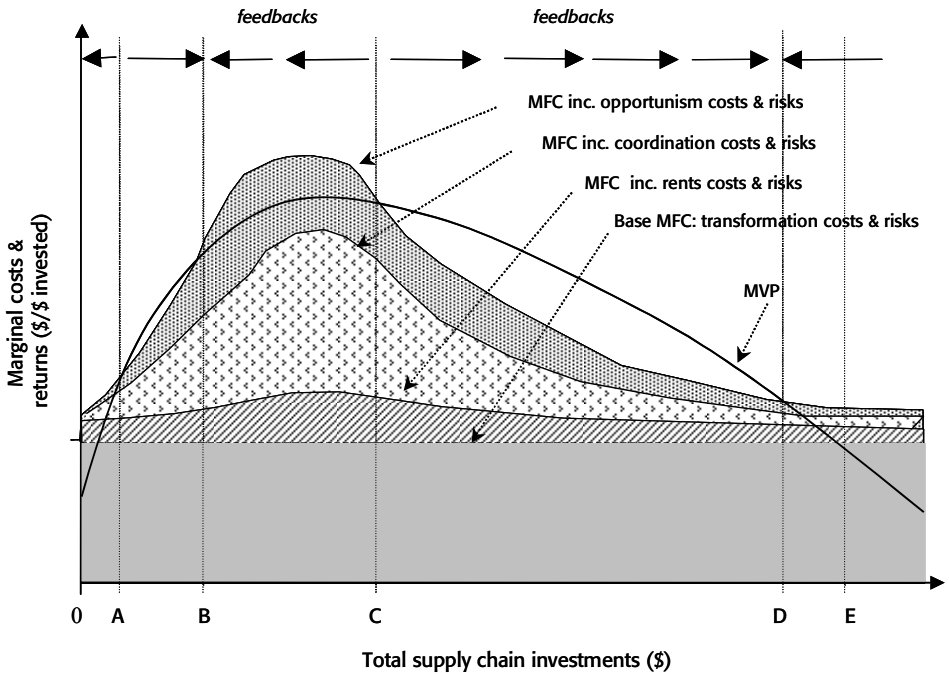
Poor rural areas in Africa are characterised by low total and monetary incomes for most people, with limited consumption and expenditures, a poorly developed monetary economy with a narrow base, and markets (for agricultural inputs, outputs and finance, consumer goods and services, etc.) which are relatively 'thin' (with small volumes traded, although for some items there may be very large numbers of people trading in very small volumes) and prone to large seasonal variability in demand and supply. These conditions normally co-exist with poor roads and telecommunications, poor information (particularly in agriculture, on prices, on new technologies, and on potential contracting partners), difficulties in enforcing impersonal contracts and widespread rent-seeking behaviour.

Such conditions pose particular problems for the supply-chain development needed for agricultural intensification, and these are exacerbated by the fact that such development may require significant simultaneous and complementary investment by a number of market participants. Such investments carry high risks of transaction failure and hence high transaction costs incurred in obtaining protection against such risk. These transaction risks (and costs) have three main components: co-ordination risks (the risk of an investment failing as a result of the absence of complementary investments by other players in a supply chain); opportunism risks (which arise when another contracting party, with monopsonistic or monopolistic control over a complementary investment or service, removes, or threatens to remove, it from the supply chain after a player has made an investment that depends upon it); and rent-seeking risks (where powerful government, political, criminal or other agents not party to a transaction see associated investments and/or revenue as an opportunity to expropriate, or threaten to expropriate, income or assets from the investor).

Co-ordination, opportunism and rent risks (and the costs of protection against them) are closely related, and where these are high as compared with potential returns to investment, then the investments required for the development of an agricultural intensification supply chain may be too risky to be worthwhile, and thus the supply chain may not develop even if it is otherwise potentially profitable.

This situation is set out in Figure 1. This shows marginal factor costs and marginal value products for total investments along a commodity supply chain (including, for example, input sellers, providers of farm finance, farmers, and produce buyers). A critical distinction is made between different elements of marginal factor cost (MFC). We begin by considering only conventional neo-classical production economics analysis; the 'Base MFC' line determined by factor use and prices and optimal supply chain investment then occurs where the Marginal Value Product (MVP) curve cuts the Base MFC line, at E. The shape and position of the MVP curve is determined by the price of the supply chain output(s) and by the technologies employed (both higher prices and better technologies lift the MVP curve, while high investments reduce MVP due to diminishing marginal returns and falling prices in limited markets).

Figure 1: High and low level supply chain equilibria (the rural 'low-level equilibrium trap' and challenges in overcoming it)



The second cost and risk band represents rents. There is long-standing concern about poor governance and opportunities for elites to extract 'rents' in the context of weak or poor and predatory governance systems. These rents may be legitimate tax demands or illegitimate demands for bribes, 'cuts' or 'fines'. The third and fourth cost and risk bands represent co-ordination and opportunism risks and costs. These are high with low investment and thin markets, but risks of co-ordination failure and opportunism (and hence MFCs) are likely to fall with high levels of investment either through the thickening of markets and/or through the efficiencies achieved in large firms (an issue we discuss later).[4] Reduced risks mean that less costly counter measures against opportunism are required, but unit transaction costs also fall with higher

4. Transaction risks in market arrangements are likely to fall at higher levels of supply chain investment as more players allow market co-ordination mechanisms to work, reducing the risks and costs of protection against both co-ordination failure and opportunism. Larger transaction volumes and/or more frequent transactions also reduce costs and risks in (inherently less risky) hybrid and hierarchical arrangements for exchange and co-ordination as the fixed costs of establishing these relationships are spread over larger and more frequent transactions, and more frequent transactions themselves facilitate the establishment of these relations and provide incentives for contracting parties and employees to honour them (Williamson, 1985, 1991).

volumes, giving a double benefit in cost reduction from greater levels of investment and turnover.

The most obvious impact of adding co-ordination, opportunism and rent costs and risks to the orthodox analysis is a shift of the profit-maximising equilibrium point to the left (from point E to point D). There is also a very substantial shrinkage of the region where MVP is greater than MFC (between investment levels C and D). If investments in a supply chain are below C, then investors have no immediate gains from increased investment (since MFC is greater than MVP) and should reduce investment as long as MFC is greater than MVP. There is then a critical threshold level of total supply chain investment (point C) below which the marginal returns to investment are negative, with negative (or positive) feedbacks below (or above) this threshold: below the threshold the supply chain is caught in a low-level equilibrium trap and, as drawn, investment at B represents a low-level equilibrium (equivalent to profit maximisation around subsistence production in the figure).[5] This analysis explains individual choices around a stable low-level equilibrium in smallholder farming areas with an atomistic market of many small players without non-market co-ordination or significant efforts towards collective action – a common situation in Africa. Ironically (given the debates about market liberalisation) the neo-classical ideal of perfectly competitive markets then provides some of the necessary conditions for co-ordination failure, and escape from the low-level equilibrium trap requires the development of non-market co-ordination mechanisms.

2.2 Policies for overcoming co-ordination failure in poor rural economies

This stylised analysis highlights the need for policy interventions to address problems constraining supply chains that are important, or potentially important, to pro-poor agricultural growth in Africa, while promoting the interests of poor producer or consumer stakeholders in those supply chains. The analysis also allows us to identify three broad functional intervention types, which we characterise as 'supply chain co-ordination', 'pump priming investment', and 'threshold shifting'. Although the nature and benefits of these three intervention types are most easily demonstrated in low-level equilibrium trap situations, they are also relevant to understanding how policy can reduce average costs and increase returns, efficiency and levels of activity in a supply chain in situations where there is no low-level equilibrium trap.

The first intervention type, 'supply chain co-ordination', involves the development of an effective system to support co-ordinated, complementary decision-making by different players across a supply chain. It is clear that a system relying exclusively on market mechanisms will not be able to provide the co-ordination necessary to cross

5. At low levels of investment the MFC and MVP curves may take a variety of different shapes, and relate to each other in a variety of ways. The broader argument for the existence of a low-level equilibrium trap is not sensitive to these shapes, provided that, with increasing total supply chain investment, the MFC moves from a position above the MVP to one where it lies below the MVP, before these positions are again reversed. In other words, crossover points C and D are critical to the existence of high and low equilibria. Drawing of crossover points A and B illustrates ways in which non-zero low-level equilibria may exist but this is not critical to the co-ordination failure arguments presented in this article.

substantial thresholds – although market mechanisms may have more of a role where the thresholds themselves can be removed or substantially reduced as part of the broad transition from an economy dominated by many small players to one in which larger firms play a greater role.

The second function for development interventions, 'pump priming investment', seeks to provide a higher investment base. It involves government or donor investments moving the level and density of investment in an economy, sector or supply chain to the right and beyond or near the critical threshold at point C in Figure 1. Attention needs to be paid here to types and modes of investment and/or subsidy that are effective in promoting substantial thickening of markets and increases in economic activity. Important challenges concern (a) identifying critical elements of a supply chain where investment will have wider stimulative effects (allowing for complementarity between some of these); (b) ensuring that the pump priming is large enough and continues long enough to cause major and permanent shifts in expectations and structural relations within the supply chain, while (c) investing in ways that promote complementary private sector investment rather than crowding it out or inhibiting it; and (d) also establishing strict and clear rules establishing time and fiscal limits to public sector investment. Historically the sustained green revolutions in Asia have been successful with (a), (b) and (perhaps to a lesser extent) (c) above, whereas the more abortive green revolutions in Africa have only achieved the first of these, and have then been forced to discontinue investments for reasons of ideological shifts and/or fiscal constraints.[6]

'Threshold shifting', the third broad development function identified earlier, is represented in Figure 1 by movement of the MVP curve upwards and of the MFC curves downwards so that point C moves to the left (to lower levels of investment) or disappears altogether. An upward shift of the MVP curve may be achieved by technical change (with increases in the marginal productivity of investment) or by increases in output price. This represents the focus of part of the current policy orthodoxy's emphasis on technical change from agricultural research and extension and on better producer prices from structural adjustment. Technological development, however, generally involves increasingly complex supply chains, with increasing investment by different and growing numbers of players. Complementary action is therefore often needed to improve co-ordination and promote technical change simultaneously, and this needs to be taken into account in the development and promotion of new technologies.

Downward movement of the MFC curves may be achieved by reduced input prices and costs (reducing transformation costs) or by reducing the costs and risks of co-ordination failure, opportunism, or rents. Again, current policy orthodoxy promoting institutional and property rights development seeks to reduce the costs and risks of opportunism and rents, and implicitly looks to the development of competitive markets to reduce co-ordination costs and risks (although our argument suggests that under certain circumstances this reliance on competitive markets to reduce co-ordination costs and risks may be misplaced).

It should be noted that, even without any low-level equilibrium trap (i.e. in the absence of point C), MVP increases or MFC reductions are beneficial as they will lead

6. Even where fiscal constraints forced policy changes, the prioritisation of fiscal cuts often reflected dominant donor ideologies.

to increased supply chain profitability and higher equilibrium investment with higher production. These may be achieved through 'supply chain co-ordination' (for example, co-ordination on product quality can often raise product prices and returns) and through 'pump priming' as well as through the 'threshold shifting' mechanisms discussed above.

3 The development of efficient local and regional markets for African produce

We now turn to consider the potential for traditional and non-traditional (international) export markets and for domestic and regional markets to absorb expanded African production and to stimulate domestic economic growth and poverty reduction. In this we draw heavily on findings from Diao et al. (2003).

3.1 Traditional export markets

Prices in many traditional export markets (for example, coffee, cotton, cocoa, tea, tobacco) are projected to remain depressed in the medium term, whilst international competition and trends downstream within commodity chains are making product quality increasingly important – an area that African cash-crop systems have generally struggled with post-liberalisation. Diao et al. (2003) also question how much the expansion of production of traditional export crops could contribute to national economic growth, although other evidence suggests that the contribution to poverty reduction could be much more significant (Deininger and Okidi, 2003). Although world cotton prices are expected to remain below their historic (30-year) levels throughout the next decade, this is one commodity where African producers are believed to have a realistic chance of increasing market share, particularly if WTO processes eventually force the US to revise its support policies to US producers (FAO, 2004; Gillson et al., 2004: 70).

The key challenges in export cash-crop sectors are to maintain or enhance product quality, to maintain remunerative producer prices in the face of low and fluctuating international prices (Shepherd and Farolfi, 1999: 89), to find ways of delivering seasonal finance to producers (discussed later), and to ensure that high quality research and extension support continual productivity increases. This requires a balance between competition and co-ordination (Poulton et al., 2004), with the appropriate role for the state depending on the evolving structure of the market. In many cases sector performance would be enhanced if public agencies (such as those with a regulatory or co-ordination function and crop research institutions) were more accountable to private stakeholders (notably producer representatives and marketing and processing companies), a first step in this being regular multi-stakeholder meetings. Export cash-crop sectors can generally finance their own developmental activities through either commercial investment or levies, providing that credible co-ordinating governance structures are put in place. Public policy should, therefore, support institutional innovation in co-ordination, with state and private actors working in partnership. Under such circumstances, improvements in sector performance should be achieved without

major additional cost to the public finances (apart from improvements to transport infrastructure).

3.2 Non-traditional export markets

Non-traditional exports (principally fish, horticulture and floriculture) have grown in a small number of countries in recent years and this should be able to continue. However, only large-scale enterprises can meet international commodity chains' increasingly tough demands for quality and traceability (Dolan et al., 1999: 39), although they may sub-contract to small growers. Growth linkages between these activities and the rest of the economy are also low and the relatively low production base (albeit now almost as important in value terms as traditional export crops) means that even quite high growth levels will make only a small contribution to overall economic growth.

Macroeconomic stability and an environment conducive to private enterprise are key to continued growth and investment in non-traditional export sectors. The state may also need to upgrade the infrastructure (for example, roads, airport facilities), provide an effective legal framework and system for contract enforcement, oversee the sustainable and equitable use of natural resources (water, land and common property fish resources) and facilitate co-ordination to achieve quality assurance (for example, provision of common laboratory facilities). Aside from infrastructural investments, the requirements for public investment are generally likely to be small.

3.3 Domestic agricultural markets

According to Diao et al. (2003), Africa's domestic agricultural markets are worth US$50 billion per annum, compared with current international exports of only US$16.6 bn p.a.. African states import 25% of their total cereal requirements, although half of these imports come from elsewhere within the continent. Strong growth in the supply to large domestic agricultural markets could have significant impacts on overall economic growth and poverty reduction, but the demand for staples is relatively price-inelastic, so that growth in supply faster than population and income growth (perhaps a combined 4% p.a. across the continent) could quickly lead to price falls – good for poor consumers, but perhaps threatening the incomes of some producers and limiting the scale of productivity gains. Faster expansion of horticultural and livestock production may be possible, with higher income elasticities and rapid growth in urban demand, but the broad picture is one of limited growth opportunities without simultaneous stimulation of demand. There are also fewer opportunities for import substitution than might be thought.[7] Most international cereal imports are either wheat or rice, in which African production potential is limited. Maize imports of around 5% of production are thought to go mainly to coastal cities (where high local transport costs make imports cheaper than locally produced food) or to conflict or post-conflict zones. However, African domestic and regional markets have less stringent quality and traceability

7. Meat, oils and fats and sugar offer the biggest opportunities for import substitution. During 1996-2000 the average (combined) value of international imports of these three categories was US$2.75bn p.a. (Diao et.al. , 2003: 13).

requirements than those evolving in export markets.[8] Improved functioning of African domestic and regional markets therefore continues to be critical for the majority of African smallholders (particularly those outside traditional export cash-crop zones).

Critiques of the current functioning of African domestic agricultural markets make four main points:

- Domestic agricultural market systems contain numerous small, under-capitalised players, but relatively few large ones (Fafchamps, 2004). Thus, whilst they may at times be fiercely competitive, they remain high-cost, as they are unable to exploit economies of scale (in transportation or market intelligence) and they incur cumulatively high transaction costs in trading products through numerous hands along the marketing chain.[9]
- Markets are volatile, partly because small players have little storage and other capacity to absorb shocks, and the impact of production fluctuations is then largely transferred to poor producers through fluctuating prices. Intra-seasonal price variation has generally risen with market liberalisation. Inter-seasonal variation is also high, whilst the problem (highlighted earlier) of falling prices with production increases will tend to become more acute where mean production levels approach national self-sufficiency.
- Liberalised market systems offer strong competition only in high-potential and/or accessible areas. Producers in remoter and/or lower-potential areas may face little choice of service provider (if pre-harvest services are available at all) or output buyer.
- Outside export cash-crop sectors, there are few mechanisms linking output market opportunities with pre-harvest services (input supply, extension, credit), limiting producers' ability to respond to market opportunities.

These problems have no 'quick-fix' solutions, but there is potential to improve market performance by promoting greater regional trade with complementary reforms to encourage greater investment by private trading enterprises (especially larger ones).[10]

Diao et al. (2003) also report very low levels of intra-African agricultural trade, currently only worth an estimated US$1.9 bn p.a. This is partly due to high tariff protection within Africa, but non-tariff factors are also important. As the Southern Africa Regional Poverty Network (2004: 51) reports, large traders are concerned over 'transport costs … the uncertainties of being paid (at all, or at least on time) by partners, and the problems of arbitrary government action', while small-scale traders complain of

8. There is a lively debate on the speed at which domestic supermarket development is likely to transform marketing chains for African agricultural produce, bringing in international standards for quality and safety, but the emerging consensus is that such a transformation is still some years off in most of Africa.
9. Economists may talk of high allocative efficiency, but low technical efficiency. Note, however, that the need for the primary entrepreneur to feed his/her family out of the profits made from turning over a relatively small capital stock can raise the observed 'profit' level, even in a competitive market. Evidence on profit margins within informal marketing systems remains inconclusive.
10. Greater investment in transport and communications infrastructure will, of course, also enhance market performance and, according to Diao et al., could be one way of relaxing the demand constraint facing African agricultural expansion (if lower marketing costs are passed on to consumers in the form of lower prices).

lack of market information and obstructive customs rules and regulations (problems that large traders were more able to deal with).

Greater intra-regional trade[11] has the potential to:

- increase incentives for large private traders to invest in the fixed costs of setting up large trading operations to profit from annual fluctuations of local marketable surpluses within wider areas;
- reduce fluctuations in prices both within and across seasons, if harvests are imperfectly correlated (or, better still, negatively correlated) across the regional trading bloc;[12]
- provide a valuable outlet for surpluses as national production of a given commodity approaches 'self-sufficiency', thus reducing the extent of the price fall during 'good' years;
- provide remunerative market outlets for producers in border areas (for example, the Southern Highlands of Tanzania), some of which are quite remote from major national market centres; and
- stimulate additional production growth through local specialisation in line with comparative advantage, with, in some cases, regional produce replacing imports from international markets.

The strongest claims for agricultural growth in Africa are currently made for parts of West Africa (for example Tiffen, 2003) as a result of, *inter alia*, regional trade liberalisation, the devaluation of the FCFA in 1994, rapid growth of urban demand, and positive supply-side stories. A common market was officially inaugurated in East Africa in 2005. Thus, whilst lack of political commitment has sometimes been viewed as an insurmountable obstacle to greater regional trade, this may now be changing.[13]

Both the West African customs area and the East African market provide for a common external tariff. Tariff protection for local agricultural producers against international imports has its appeal, especially where world prices are artificially depressed by wealthier nations' export subsidies. However, the immediate major beneficiaries are primarily net surplus producers, whilst net consumers (most poor households) lose out from higher food costs. There may, however, be medium-term benefits for poor consumers through multipliers in the local economy. Tariff protection thus needs to be analysed case-by-case, taking account of the range of commodity chain issues discussed earlier. These include:

11. Due to prohibitively high long-distance transport costs, most intra-African trade takes place within regional blocs in Southern, Eastern and West Africa, rather than between these blocs.
12. Analysis of FAO maize production data for Southern and Central African countries for the period 1972-2002, for example, shows significant correlations between harvest levels in South Africa, Zimbabwe and Zambia and also in Malawi, Mozambique, Tanzania and DR Congo. However, harvests across these country clusters were not significantly correlated. No significant negative correlations were found.
13. Lack of political will remains a constraint in Southern Africa, despite the existence of SADC for more than two decades. Governments are reluctant to commit themselves to respect free private trade in staple foods, given the regular occurrence of drought seasons. In East Africa, by contrast, sensitivities have focused on the industrial sector and whether free cross-border trade will exacerbate existing inequalities in industrial development.

- the size of tariff: the negative impact on poor consumers argues for a low tariff (10-20% at most);
- the speed and scale of domestic supply response to the price incentive provided by the tariff and the direct and indirect benefits flowing from it: it is only worth penalising consumers if the state and other actors are going to use the opportunity to support producers to expand production which provides wider economic and poverty-reducing benefits. Will the producer benefits and the revenues from tariffs on agricultural imports be used to increase investment in African agriculture?
- the extent to which poor consumers would suffer from, and can be shielded from, higher prices;
- reduction in the rent-seeking that commonly surrounds tariffs: this again argues for a low tariff. Importantly, however, the incentives for equitable and transparent application of tariff policy may be stronger within a regional customs union than when tariffs are strictly a national matter;
- the impact on cross-border trade outside the customs area: free trade within the customs area should not be accompanied by restrictions (other than the basic tariff) on trade with neighbouring countries outside the area (the Southern Highlands of Tanzania provide a good case for this). A more general point is that promotion of regional trade requires major cuts to be made in the bureaucratic requirements surrounding such trade (for example, export licensing procedures) and credible commitments on the part of governments not to intervene in trading (for example, by slapping on temporary export bans) in response to short-term political pressures.

Whilst greater opportunities for regional trade may encourage investment by large-scale traders and agribusiness, additional measures should also be taken, particularly if states wish to see greater private investment in storage of grains and other non-perishable crops. Unless they are willing to play the patronage game, large traders are more demanding than small-scale traders when it comes to conditions for entry into markets. Macroeconomic stability is important for large-scale trading operations.[14] In regard to storage, the predictability of government interventions in markets – including policies relating to food aid – is a central concern. The development of warehouse receipt systems, leading to the development of inventory credit products, shows great promise for increasing commercial storage activity, with possible additional benefits for smallholder producer groups (Coulter and Onumah, 2002).[15] From the earlier discussion of market opportunities, efforts should also be made to encourage large-scale

14. Currency stability is also valued in regional trading operations, as there are generally no instruments for hedging regional currency risk. The lack of such instruments – and hence the additional risk borne by traders – will tend to raise the margins sought by traders and hence lessen somewhat the impact of their operations in stabilising prices.
15. Inventory credit is also likely to be of particular benefit to indigenous trading enterprises that lack ready access to international capital. Where encouragement of large-scale trading enterprises is a politically sensitive issue because of the likely dominance by transnational firms or minority ethnic groups, creative ways can perhaps be sought to encourage trading enterprises to offer a proportion of their shares to the general public.

investments in oilseed processing. Oil crops are eminently suitable for smallholder production; some (for example soyabean) have important soil fertility benefits, and investment in specific processing assets may provide processors with incentives to invest in pre-harvest services (for example, seed supply) to smallholder suppliers.

Two other measures are desirable to enhance or protect the efficiency of national and regional markets:

- The potential of market information systems (MIS) both to increase market efficiency and to strengthen the bargaining position and/or competitiveness of smaller players (producers against traders, small traders against large) is widely accepted. However, the experience of public investment in MISs has often been disappointing (Shepherd, 1997), with information disseminated too slowly or infrequently to be of real use to producers, let alone traders, and governments failing to sustain systems originally established with donor funding. Now, though, a number of innovative approaches are being piloted around Africa. These build on advances in communications technology and liberalisation – especially local FM radio, mobile phones, internet and satellites – to speed up information dissemination and to recognise the need to involve stakeholders in system design, management (for example, the farmers' union in Mali), and/or financing (for example, traders in the Foodnet system in East Africa).[16] Questions as to whether provision of information needs to be accompanied by more pro-active efforts to link farmers to new markets (Galtier and Egg, 1998) remain pertinent and are addressed in later sections.
- Commodity exchanges, such as ZIMACE in Zimbabwe (currently closed) and KACE in Kenya, also enhance the efficiency of impersonal, long-distance trade by providing market information and offering fast and low-cost resolution mechanisms for contractual disputes.[17] Western Kenyan experience shows that well-organised farmers, as well as traders, can benefit from commodity exchanges (Woomer and Mukhwana, 2004). However, the existence of large-scale players (both sellers and buyers) is a prerequisite for the establishment of commodity exchanges, to provide a critical mass of trading activity that smaller players and those wishing to make occasional trades can then link into.

Finally, local taxes and levies on agricultural trade are an emerging concern in the institutional environment for private trading activity (both large- and small-scale). These are one of the few ready sources of local revenue for decentralised administrations, especially in remoter rural areas, but their proliferation and high rates can act as a serious disincentive to trading activity, and can seriously depress the prices received by producers for their output. They also create scope for rent-seeking.[18] There

16. An interesting dimension of Foodnet is that, although it began in Uganda, its information now also caters for users elsewhere in the region.
17. The existence of such exchanges is also a prior step to the development of more sophisticated trading contracts, such as futures and options.
18. Similar comments can be made about trading licensing requirements (both national and local), which should be minimised. Basic operational licences are acceptable, but requiring a licence per consignment is not.

is clear scope for greater accountability within local revenue collection, but there may also be a need (as in certain cash-crop systems in Tanzania) for central government to impose limits on the total allowable levy that decentralised administrations can charge. If a reasonable balance between revenue collection and incentives to traders and producers cannot be struck, then governments may have to find alternative sources of funding for decentralised administrations.

4 Beyond output market efficiency

In the previous section we outlined measures for increasing the efficiency of African agricultural commodity markets, with a particular emphasis on national and regional markets. Greater market efficiency should lessen the degree of price fluctuation experienced by both producers and poor consumers. As long as retail market concentration remains limited, greater market efficiency should also raise the mean price received by producers for their products. However, we should be realistic about what can be achieved from measures to enhance the efficiency of markets alone, given the current production and market conditions facing African agriculture: fluctuating harvests from numerous, dispersed, small-scale producers relying on rainfed production technology; low levels of infrastructural development; limited (if growing) demand for additional produce from domestic and regional consumers; and generally under-capitalised trading systems. In this and the following sections, we therefore consider other measures to create the conditions for smallholder producers to invest in intensified agricultural production. These involve:

- reducing the fluctuations in the prices that producers receive for their produce;
- stimulating the markets for indigenous food products;
- improving the quality of support services offered to producers; and
- giving producers greater security in their access to remunerative output marketing channels.

Measures to support smallholder producers should be designed to be as compatible as possible with the promotion of private trading activity outlined in the previous section. However, it should also be remembered that the ultimate policy goal is the eradication of poverty, not the creation of efficient private commodity markets.

4.1 Price stabilisation

Commodity prices can vary within and across seasons. Some intra-seasonal variation is inevitable, given the strong seasonality in local supply and the cost of storage.[19] Similarly, some inter-seasonal variation may be desirable, as higher prices compensate producers for lower harvests in poor years (Newbery and Stiglitz, 1981). However, inelastic demand for many of the principal crops produced by African smallholders and imperfections in the functioning of commodity markets can combine to make both intra-

19. It can cost US$20-30 p.a. to store a ton of grain that cost US$100 per ton to buy and transport to the warehouse. This does not take into account the opportunity cost of capital tied up in storage.

and inter-seasonal price variations unhelpfully severe. Smallholder producers are particularly discouraged when bumper harvests lead to price collapses for particular crops, whilst the poorest consumers are vulnerable to very high prices for staple foods in the lean season following a bad harvest.[20]

Public interventions to stabilise prices tend to focus on grains, because of their storability and their importance to the budgets of poor consumers in many African countries. In addition, both food price instability (Fafchamps, 1992) and high marketing margins (Jayne, 1994) encourage poor producers to prioritise staple food production for own consumption before diversifying into higher-value crops primarily for sale. This reinforces the problem of low returns to production activity depressing investment (including in soil fertility), resulting in low or even declining production.

The challenge for public intervention to stabilise grain prices is to augment the price-stabilising effects of commercial storage activities without crowding-out such activity or incurring unsustainable fiscal costs.[21] The case for public intervention will be stronger in landlocked countries and where agreement on regional trade liberalisation has not been reached. In countries where Poverty Reduction Strategy Papers and/or national agricultural development strategies (see below) identify price fluctuations of staple commodities as major issues affecting poor producers and/or consumers, multi-stakeholder working groups should be convened (by the Ministry of Agriculture or another responsible agency) to examine alternative models for achieving a greater degree of price stabilisation. We suggest two approaches that governments interested in price stabilisation may consider:

- Coulter and Poulton (2001) suggest that public intervention in grain markets could be contracted out to an autonomous agency, rather as UK interest-rate management has been delegated to an independent Bank of England. Under this model, the responsible Minister would stipulate the band within which wholesale grain prices in key provincial grain markets should be maintained. It would then be the responsibility of the autonomous intervention agency to buy, store and sell grain to defend this band. The width of the band should be set to encourage commercial trading organisations to undertake the majority of storage activity within the country, with public intervention designed primarily to avoid extremes in market fluctuations. As well as minimising crowding-out effects, a relatively broad band would also keep down the fiscal costs of public price stabilisation activity.[22] A key issue with this proposal is the governance of

20. Removing restrictions on commercial imports of grain would set a price ceiling on the import parity price. However, in some circumstances (for example, landlocked countries and/or remote rural areas), even this may be considered unacceptably high for poor consumers.

21. A key determinant of the cost of intervention is the degree of price stabilisation that is sought. In addition, public stock-holding is prohibitively expensive where macroeconomic stabilisation has not been achieved and real interest rates are high (as in Malawi prior to 2001). Where a country achieves net grain surplus status, using a national price stabilisation agency to absorb surpluses (as in India or in Zimbabwe in the mid-1980s) can also be prohibitively costly. At this point, policy has effectively moved beyond stabilisation to price support.

22. There is an important difference between this proposal and the mandate of the independent Bank of England, namely, that the fiscal costs of grain purchase and storage are unpredictable and could be large in some seasons. Thus, specifying a budget for the autonomous intervention agency, with which it should

the autonomous price stabilisation agency: will politicians give it a clear mandate, but then allow it operational independence in pursuing this? Clear rules and managerial independence are key to creating confidence amongst commercial trading organisations to engage in their own storage activities. Arbitrary disposals of stored grain for short-term or local political ends are one of the biggest disincentives to investments in private storage.

- A second model is to offer a degree of price support and guarantees of market access to identified 'critical commodity chains'. Under this system, each year around planting time a state agency would offer to chosen producers' associations a limited number of free 'options' under which it would guarantee to buy from option-holders a certain volume of grain after harvest at a specified price. A further set of options would be offered for sale by auction. Owners of options could then decide at harvest time whether or not to exercise their option to sell at the set price. Such a system would not guarantee a general post-harvest floor price for producers other than those holding options, and the actual fiscal costs would vary from year to year,[23] being highest in years of bumper harvest (when some stocks might have to be stored for 18 months or more before disposal). However, it would support investment in grain production by 'critical' smallholder suppliers, whose marketed surpluses would form the basis of national food availability. A key issue would be how the free option rights were distributed (and how, and how often, the allocation of these rights was reviewed). Clear rules for the disposal of acquired produce would also be needed. One possibility would be to link this system to a network of Indian-style fair price shops selling subsidised flour to consumers in poor urban areas. However, this would have to overcome the problem that state-administered marketing of processed grains in Africa has often been high-cost (Jayne et al., 1995, 1997).

In neither of the two models proposed above does the public intervention agency need to engage directly in purchase and storage activity: it could contract private companies to purchase and store on its behalf. In the first option, the autonomous price stabilisation agency might even rely primarily on buying and selling warehouse receipts for grain stored with private companies (where a system of receipts existed) to achieve its objectives. Similar use of private sector agents could be developed with the second model, so that public intervention could have positive impacts on the development of private storage and trading capabilities.

Even in the presence of the national models discussed above, local storage (especially linked to inventory credit) may still make sense where high trading margins

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maintain a given price band, could be difficult. Particularly in a bumper year, the agency may need to be able to call upon additional 'emergency' funding if it is to be able to defend the agreed price band. This unavoidable flexibility in the agency's budget constraint could both complicate assessment of the agency's performance and weaken its incentives to perform with maximum efficiency.

23. One way of handling this would be to establish a dedicated fund that could be invested in Treasury bonds or other suitable instruments when not required for grain purchase. According to the size of this fund, the quantity of grain sales for which options were offered, and the price at which they were offered, could be determined each year.

and transport costs serve partially to segment local markets. Local cereal banks can have an important role to play in storing grain for local consumption and possibly in marketing surpluses to wider markets.[24] The governance and promotional issues for local cereals banks are similar to those for farmers' associations (discussed later), with additional technical support needed to ensure adequate grading and quality control during storage.

4.2 Enhancing the markets for indigenous food products

Enhanced market efficiency will influence the quantity and cost of food available to African consumers. On the production side, the measures set out above will provide additional assistance to a subset of producers (often 'upper' smallholders), who may be considered as the pioneers of smallholder commercialisation. However, the demand-side constraints identified by Diao et al. (2003) may still operate. A related concern is the relative lack of attention given to the promotion of indigenous crops and food products, as compared with the research investment (Naylor et al., 2004) and promotional budgets available to major crops and products. Creative use of public resources could contribute to expanding market demand for products based on indigenous crops (to counter the progressive increase in consumption of imported wheat, rice and processed foods), combined with support for innovation to enhance the nutritional status of marketed foods. We propose the establishment of competitive regional 'challenge' funds to support:

- the promotion of food products based on indigenous crops or produce – to compete with international products with global advertising budgets – and/or the scaling up of production as demand increases;
- research into local food product processing, to lead to increased utilisation of indigenous crops and/or the nutritional enhancement of existing food products.

More generally, national and local development planning should pay due attention to the promotion of both horticultural and livestock production and marketing activities. There is a strong economic rationale for this as they are relatively high-value semi-tradeable product groups with a high income elasticity of demand. The keeping of livestock at the household level can also perform important savings and insurance functions as well benefiting soil fertility, whilst at the commercial level, there are strong positive demand externalities for grain production.[25] Greater consumption of both horticultural and livestock products, as these became more plentiful and cheaper, would also be good for nutritional indicators in Africa.

24. Commodity exchanges would provide the most obvious link between local cereals banks and wider markets.
25. Diao et al. (2003) observe that the linkages between livestock and grains production are much weaker in Africa than in Asia. This is because livestock production is currently much less commercialised in Africa than in Asia.

5 Promotion of basic financial services for the poor

So far we have considered measures to strengthen the output markets that African smallholders sell into. However, one of the points of departure for this article is the view that, at low levels of market development, demand and supply constraints reinforce each other through the resulting high transaction costs of agricultural trade. We therefore now consider the range of pre-harvest services needed by poor agricultural producers if they are to respond to enhanced market opportunities.

We begin with financial services. The main services required by rural households are savings, credit, insurance and money transmission. These are often closely related to each other, and also with input and output marketing services, as regards both the problems they face (for example, low levels of activity with small and dispersed, hence high-cost, transactions), and the way that supply and demand constraints across input, output and financial service delivery interact in the vicious circles of low-level equilibrium traps discussed earlier. Poor money transmission services contribute to this by reducing investment flows from migrant workers to rural areas, inhibiting their potential contribution to raising volumes of savings, input purchases, output sales and incomes.

5.1 Savings and credit

There are particular challenges in the provision of savings and credit services in poor rural areas, and in particular in providing credit for seasonal purchases of crop inputs:

(i) small-scale deposits and loans lead to very high transaction costs, exacerbated by the dispersion of rural populations and poor communications infrastructure;
(ii) the seasonality of agriculture leads to patterns of lumpy demand and repayment by all farmers, often with a period of several months without income (during which it may be difficult to make repayments);
(iii) lending to agriculture in a given area faces covariant risks from adverse weather or prices affecting large numbers of farmers in similar ways. These and other risks make agriculture particularly risky, but insurance markets are usually non-existent and smallholders generally lack collateral to borrow against;
(iv) covariant risks (of events striking many members in a community, for example the effects of drought or adverse price changes) and seasonal patterns of crop financing affect not only the demand for credit but also savings deposits and withdrawals by rural people;
(v) there are further problems in financing input purchases for subsistence-crop production, as the financed inputs do not directly lead to sales from which repayments can be made.

These difficulties make provision of banking services costly and unprofitable in poor rural areas, so that these areas are poorly served by banking facilities. Difficult and costly access to these facilities, located in distant urban centres, then constrains demand even for relatively straightforward deposit or withdrawal services.

In the past, African governments addressed these challenges in a number of ways. One mechanism was to require commercial banks to open branches in rural centres, to operate mobile banks, and/or to allocate a minimum proportion of their lending to agriculture. Such mechanisms were rarely effective as they were loss-making and banks frequently found ways of circumventing them. Another approach was to set up state banks with specific rural or agricultural mandates. These generally operated with a high degree of inefficiency, paid insufficient attention to savings and deposit services, were financially unsustainable and often did not serve the intended beneficiaries (Von Pischke et al., 1983; Braverman and Guasch, 1986; Yaron et al., 1998) These activities of state- and donor-sponsored agricultural credit agencies have led to a climate of 'strategic default' among farmers in many areas (Poulton et al., 1998), whereby farmers' past experience of 'getting away with' loan default without any penalties of enforced loan recoveries or even reduced access to future credit opportunities means that they see no incentive in repaying loans.

It is, however, difficult to identify many successful alternative financial service providers for poor rural areas in Africa. There has been considerable discussion of the growth of informal financial institutions serving the poor, including savings and credit co-operatives (SACCOs), Caisse Villageois and Village Banks, Rotating Savings and Credit Associations (ROSCAs), Accumulating Savings and Credit Associations (ASCAs) and micro-finance institutions (MFIs). There are examples of SACCOs with wide rural outreach in Francophone Africa. They can be very effective in savings mobilisation and can also provide useful links to, and entry points for, formal banking services in rural areas. These links are constrained, however, by poor penetration of banking services.

While informal financial institutions can offer a range of savings and deposit services to rural people, they face considerable difficulties in offering seasonal credit services. Some do offer a range of loan products, but, without links to wider financial networks outside rural areas, such institutions (and depositors' funds) can be vulnerable to covariant risk. Like private, informal lenders, they tend to have both a limited capital base and repayment incentive structures which favour lending for short-term and consumption loans and (with the exception of interlocking transactions by agricultural traders, discussed later) are rarely keen to lend for agriculture and natural resource-based enterprises (Jones et al., 1999). Links to formal institutions can open up access to funds for lending to members, but the rapid expansion of SACCOs as channels of credit from outside funding sources can also weaken incentives for prudent management and protection of savers' deposits (Goldstein and Barro, 1999; Outtara et al., 1999). The requirements of these informal financial institutions for membership fees, savings and (for lending) collateral also mean that they often reach better-off villages and individuals, and exclude poorer communities and individuals (although the poor may still benefit indirectly from their activities through consumption and production linkages and multipliers).

The conventional MFI approach to lending to the poor relaxes collateral requirements and focuses on short-term loans associated with compulsory regular (weekly, fortnightly or monthly) savings and repayments. These savings and repayment patterns are not conducive to lending in poor rural areas, or to lending for agriculture, and the vast majority of successful MFIs operate either in urban areas, in rural market

centres, or in densely populated rural areas with a strong non-agricultural economy and/or agriculture which has already started to 'modernise' (Dorward et al., 2001). Similarly, the vast majority of MFI clients tend to be small traders or micro entrepreneurs.

Interlocking transactions (Poulton et al., 1998) are an institutional arrangement whereby buyers of a crop provide inputs on credit at the beginning of a season and recover the input and credit costs when subsequently purchasing the crop. Conditions under which interlocking transactions will provide a sustainable and equitable means of input financing are quite restrictive (Dorward et al., 1998: 257-9) and in liberalised markets are normally found only with higher value and concentrated or co-ordinated cash-crop supply chains where crop traders are able to access formal sources of working capital. Cash-crop traders or processors may also provide inputs for food-crop production as a service to attract and support farmers producing cash crops (for example Poulton, 1998; Govereh et al., 1999). Otherwise, the variable returns in food-crop production, together with low returns and highly dispersed market structures in food-crop trading, mean that there are particularly difficult challenges in providing seasonal finance for food-crop production.

Some of the most successful interlocking lending schemes for cash crops, such as that run by Cottco in Zimbabwe (Gordon and Goodland, 2000), have used borrower groups to enhance loan repayment, despite the problems that covariant risk can generate for mutual liability (Stiglitz, 1990). The farmers' associations promoted by CLUSA in Mozambique and elsewhere have also demonstrated some success in enhancing their members' access to seasonal credit and achieving high repayment rates. There is less experience with the use of group lending approaches for food-crop production in a liberalised market context.

A further gap in agricultural lending is medium-term loans (two or more seasons) for livestock development or the purchase of capital equipment.

5.2 Insurance

Zeller and Sharma (2000) argue that an important part of financial services should be to enhance the poor's ability to bear risks. Provision of insurance services to the poor is not, however, an area that has enjoyed much prominence or success, and this is particularly true in agriculture. Paul Mosley (pers. comm.) argues, however, that the requirements of the poor are, first, for insurance, then for saving (without minimum deposit or transaction constraints), and then for borrowing.

However, insurance in agriculture faces many similar problems to those of lending: high transaction costs and risks as a result of asymmetric information; adverse selection; moral hazard; small insured amounts; and high monitoring costs. In addition, both idiosyncratic risks (of events that independently strike individual households) and covariant risks tend to be large, so both the needs for, and difficulties with, insurance are very high. A number of large-scale programmes for smallholder agricultural insurance failed in the 1960s and '70s: large-scale insurance schemes should therefore be approached with great caution (Hazell et al., 1986).

Insurance is a particular issue in lending to the poor for productive investment, as the loans tend to be large in relation to their income and assets, and an event that

prevents them from realising a return from that investment may place them in the disastrous situation of needing to finance the burden of future loan servicing and repayment without any increased assets or income from the loan.

Successful lending programmes for cash-crop inputs deal with this problem (at least in covariant risk situations, such as bad harvests) in the same way as moneylenders deal with largely idiosyncratic risks (Aleem, 1990), by rolling unpaid debts over to the next season where a borrower has a previous record of reliable repayment. Lending for food-crop production faces greater difficulties in this area, however, as – with covariant risks – there is likely to be greater political pressure for loan forgiveness in a bad year. This can be disastrous for credit fund liquidity and, without careful design of loan and insurance systems, can promote a culture of strategic default. One way to address this would be to investigate the potential for reinsurance of lending programmes against the effects of covariant risk causing widespread default; this might perhaps be organised by NEPAD across the whole of Africa. Another approach to weather risk is to use agricultural insurance schemes with district- rather than farm-based assessments of loss and independent yield estimates based on, for example, satellite remote sensing of rainfall and crop growth patterns (Skees, 2002 in Kelly et al., 2003). However, this approach tends to reduce the correlation between personal risk and insured losses, and thus reduces the effectiveness of the insurance to the extent that it can become more like a lottery with a high correlation between the chances of suffering a crop loss and 'winning the lottery'.

Another source of risk – indeed a growing problem that is increasingly affecting farmers' choice of crops in some parts of Africa – is theft and insecurity of crops in the field. This is an issue that local governments and traditional authorities need to address.

5.3 Transmission services

Transmission services, allowing clients to transfer funds from one area to another, have been given little attention in the literature on micro-finance services in sub-Saharan Africa outside South Africa. This is surprising, given the importance of internal and international migration in Francophone West Africa, and the increasing importance of remittances in rural livelihoods throughout the continent (Bryceson, 1999). It also has important implications for the seasonal financing of agricultural inputs, as a number of authors report the use of remittances for agricultural investment (for example, Govereh et al., 1999). Experience in South Africa suggests that this is an area with important potential benefits from linkages between commercial banks and micro-finance and informal institutions, but minimum flows of business and transaction sizes will again determine areas where these services are viable.

5.4 Financial services for the rural poor: conclusions

Dorward et al. (2001) conclude that there are three broad, necessary (but not sufficient) conditions for improved financial service provision in poor rural areas and in smallholder agriculture: a favourable environment, effective organisational management, and financial service products or technologies that meet clients' demand. Aspects of particular importance in the favourable environment include a political and

regulatory environment providing financial institutions with independence to mobilise deposits, set interest rates, select clients and enforce loan recovery. Governments must support this with sound macroeconomic management to ensure reasonable and stable interest rates, and sound but not excessively burdensome regulation. Good organisational management requirements include independent professional managers and governance structures that protect the interests of depositors.

Organisational development and capacity-building for both state and micro-finance organisations are critical and could benefit from more donor support. Product development to meet the needs of poor rural people in agriculture is particularly challenging, but is increasingly recognised as a major gap by micro-finance organisations committed to reaching the poor in Africa. A key role for donors is to support experiments by both informal and formal financial service providers in developing transmission, insurance and seasonal finance services.

Seasonal crop finance systems could be implemented as part of the 'critical commodity chain' focus advocated in this article, building up from small schemes to tie together local and wider (national and regional) actions to stimulate supply and demand co-ordination across financial, and input and output marketing, service delivery. Successful models need to address the financial service needs of input and output traders as well as farmers, and governments may need to subsidise the early stages of financial service development in particular.

6 Input market development

It is widely accepted that increased use of purchased inputs (seeds, fertilisers and chemicals) has a critical place, alongside organic soil fertility enhancement practices, in the technical change needed for sustained smallholder agricultural growth in Africa. Purchased input use is, however, very low in Africa and has remained largely static over the last 20 years or so,[26] with particularly low usage in smallholder food-crop production where constraints on expanded input use exist on both the supply and demand sides.

6.1 Constraints on input demand

Demand is affected mainly by low profitability and high risks in farmers' use of purchased inputs and by lack of access to seasonal finance. The latter has already been discussed, although the need for co-ordination in the delivery of financial and input delivery services should be noted.

Profitability and risks in input use are affected by input and output price levels and stability, by the quality of inputs, and by the technical efficiency with which they are used. Output price levels and stability have already been discussed, but it should also be

26. For example Crawford et al. (2003) (using FAOStat data) report high variability between countries in growth of total fertiliser use and in intensity of fertiliser use from the 1980s to late 1990s, but find only one country (Ethiopia) with a major increase in fertiliser use on food crops (the result of large-scale and intensive government support to intensive smallholder maize production). Kydd et al. (2004) (using World Bank data) report roughly constant total fertiliser use from the early 1980s to mid-1990s, and a fall in fertiliser use per ha. Rohrbach et al. (2003) report a small commercial seed sector in Africa that is narrowly based in terms of its coverage of both countries and crops.

noted that market liberalisation has often led to an increase in input financing difficulties and a decline in input profitability as a result of increases in input prices following currency devaluation and removal of input subsidies. These changes were particularly serious for more remote surplus food-crop producers, for whom market liberalisation also led to reduced output prices. Rapid and sudden devaluations have also often led to input price uncertainty and exacerbated difficulties and costs in seasonal finance. One benefit from higher fertiliser prices has been increased interest in improving efficiency in using fertiliser through ISFM (integrated soil fertility management) in which limited use of purchased inputs is complemented by organic technologies. This is better for the soil and for household finances and risk than the use of inorganic technologies alone, but also better for production than the use of organic technologies alone. However, despite significant successes with ISFM (see, for example, Place et al., 2003; Snapp et al., 2003), there has been only limited progress in developing ISFM technologies where population density and land pressure are very high.

Efficiency of input use and hence farmers' demand for purchased inputs can also be encouraged by strengthening technical knowledge about their use. This requires that farmers access both relevant information and affordable inputs (Kelly et al., 2003), and hence co-ordination between input delivery and extension services is required. One means of improving access to affordable inputs is the provision of mini packs, which enable farmers to buy inputs in small quantities – to match their access to finance, to allow testing out of small amounts, or to allow cumulative purchases during a season, depending on the way the crop develops. This may be an important step on the path to increased input use, as the main impact of small packs may be not so much to increase production themselves (as total sales quantities may be quite small) as to encourage farmers to move on to larger purchases. Bulk purchases by farmer organisations may also allow reduced access costs for members.

6.2 Constraints on input supply

Views about constraints on input supply in liberalised input markets are divided along similar lines to those on constraints on output market development. Jayne et al. (2003) document continued government interventions that have clearly depressed incentives for private sector investment in fertiliser supply in Ethiopia and Zambia. However, consistent and transparent government policies are a necessary but not sufficient condition for private sector investment in input supply. Jayne et al. also report high marketing costs which could be reduced by improving transport infrastructure and management, by reducing uncertainty about government fertiliser interventions, and by cutting taxes and port fees. Co-ordination costs and risks also need to be taken into account, as discussed earlier, and actions to improve critical supply-chain co-ordination could lead to reduced uncertainty about input demand.

These issues need to be considered at all levels in the fertiliser supply chain, from large importers to small retail outlets in rural areas. The latter face considerable risks in stocking fertilisers, as farm purchases are made in fairly narrow time windows and are also often very uncertain – depending upon farmers' assessment of input profitability and upon their ability to finance purchases in an uncertain climatic, economic and

political environment. This puts stockists at risk of being left with excess inventory, which often cannot be disposed of for another year and which may deteriorate in storage. Input selling is not only more risky but also more demanding of capital and knowledge than, for example, retailing of drinks, soaps and groceries, which does not require specialist knowledge and can turn over its capital regularly through the year. Some of these difficulties can be addressed through agro-dealer programmes, which promote technical and business skills and access to supplier credit for specialist agro-dealers and general rural retailers. Bilateral arrangements between input suppliers and farmer organisations can also help to increase the volume of demand and transaction sizes, while reducing uncertainty, all of which can reduce input suppliers' costs and risks.

Input supply systems face a number of other difficulties associated with quality assurance, promotion, and their impacts on the natural environment. The nature of chemicals and seeds makes it difficult for farmers to gauge their quality at purchase, and they therefore need some form of assurance of the genuine quality of their purchases. For seeds, most countries have varietal registration and certification regulations designed to protect farmers against purchase of poor quality seed. The high cost and delays in getting seed approvals, together with the small size of seed markets in most African countries, present a serious disincentive to private sector seed suppliers, and more rapid progress is needed on harmonising varietal registration and certification across countries (Rohrbach et al., 2003). Further challenges exist where varieties are the product of a public research system and for open pollinated varieties, as in both cases the incentives and systems for registering varieties may be weak. For chemicals, there is a risk of sales of adulterated and/or out-of-date and ineffective stock. This has been a reason for regulations prohibiting repackaging of fertilisers into mini-packs. Stable development of market systems is needed for stockists to build up relationships and reputations with farmers in their localities.

Input stockists face a further difficulty in promoting input use, as individual stockists rarely have funds to do this and they also face a problem from free-riding: if one enterprise invests in promotion of input use, others may enter and share in the benefits of the expanded market. This suggests a continuing role for public extension services – albeit perhaps in partnership with private input suppliers – in the promotion of agricultural intensification.

Finally, there are important environmental and health risks associated with the use of some chemical inputs, and considerable sensitivities around the introduction of GM crops. It is likely that GM crops will become increasingly widely used in commercial agricultural production around the world. Biotechnology has a potential major contribution to make in addressing otherwise intractable issues mainly related to tolerance of disease, drought, salinity, etc., and regulation of its use needs to tread a careful line that does not deny smallholder farmers access to technologies that may have the potential to raise their productivity or access to international markets. Safe use of chemicals is an important topic for agricultural extension services.

7 Co-ordination

It is the contention of this article that the enhanced provision of pre- and post-harvest services to smallholder agricultural producers is critical to stimulating smallholder agricultural growth and intensification in Africa. Moreover, it is important not just that these services are provided, but that their provision is *co-ordinated* so that individual investors are assured that their investments will not fail as a result of other investors either failing to make complementary investments or behaving opportunistically. Ways in which the low-level equilibrium trap of co-ordination failure may be overcome were identified in section 2 as 'supply chain co-ordination', 'threshold shifting' and 'pump priming'. Discussion in subsequent sections has concentrated primarily on 'threshold shifting' solutions that affect prices and/or the efficiency of production or service delivery.

However, we have also recognised the need for co-ordination both across providers of complementary pre-harvest services and between provision of access to pre-harvest services and to output market opportunities. How may such co-ordination be achieved? In the case of some cash crops, the co-ordination challenge is 'internalised' within the activities of large, vertically integrated produce-buying and processing companies. Nevertheless, the state may have a role here in helping to find an appropriate balance between inter-company co-ordination (to protect the investments of large firms from opportunistic activity by smaller competitors) and competition (to promote efficiency and equitable prices paid to smallholders) (Poulton et al., 2004). A 'critical commodity chain' approach could similarly promote co-ordinated service delivery for food-crop production by qualifying smallholder groups, interlocking seasonal credit and input provision with price premia and stabilisation measures to encourage repayment. In a given district or region this co-ordinating function might be performed by NGOs or area-based development projects. Although these tend to have a finite funding period, their sustainability might be increased by imaginative arrangements with commercial finance, input and output marketing firms. An emerging alternative is to embed this co-ordination role within decentralised development planning processes (see section 8), whilst farmer organisations are also likely to play a critical role in local co-ordination mechanisms (see section 9).

8 Accountability and 'voice' in rural policy and institutional development and performance

Given that overcoming market co-ordination problems will require a more active role for the state than is accepted by the current international policy 'consensus', increased attention must also be paid to governance issues – improving the performance of state agencies in rural development, rather than simply reducing their role. Making policy-makers and service providers more accountable to smallholders (and, where appropriate, other stakeholders) for their performance should be at the heart of improved sector governance.

Due consideration should be given to governance issues for at least two further reasons:

- First, identification of priority areas for agricultural investment (including, but not limited to, investment in support of market development) should not imply a blueprint for agricultural intensification and growth in Africa. Rather, specific needs, and the balance of those needs, will vary both by country and by region/district within countries. Foster (2001) emphasises that the diversity of the agricultural sector is an important factor, differentiating it from social sectors such as health and education. There is thus a critical question about how national and local priorities are to be identified. In terms of impact on agricultural performance, the policy and investment decision-making processes are as important as the technical advice that informs them.
- Second, attention needs to be paid to the effectiveness and efficiency with which identified priorities are pursued, as and when public investment is increased. Questions of effectiveness and efficiency inevitably cast the spotlight onto the incentives facing relevant public agencies and their employees, as well as the capacity of such agencies to deliver on agreed strategies and programmes.

We focus on three areas of action to promote good governance: developing external accountability in policy-making and implementation, donor and government funding mechanisms to support external accountability, and reform of the role and structure of Ministries of Agriculture.

8.1 Developing external accountability

The degree of external accountability that public agencies are subject to is critical to the incentives that they and their employees face. Experience suggests that greater accountability is needed both 'upwards' (to specialist public bodies and elected politicians) and 'downwards' (to clients). Thus, the job of ensuring value for money and accountability for expenditure in irrigation or road investment should not be left entirely to a national audit commission or to MPs' questions during budget presentations, although these are both important. Similarly, the high information costs in African rural areas mean that clients (the service users) often have better information than managers on how public employees, such as extension agents, spend their time.

A credible and coherent national agricultural (or rural) development strategy must be at the heart of sector governance, as a focus for relationships between domestic stakeholders and also between these stakeholders (especially the relevant state agencies) and donors. Whilst agriculture is commonly referred to as the 'backbone of the economy' in political discourse (and in PRSP documents) in African countries, only a limited number of countries have a credible and coherent national agricultural (or rural) development strategy. Only a further subset of these can claim that the strategy was developed in full consultation with farmer organisations, NGOs and private sector representatives, let alone that such players are expected to monitor the performance of public agencies in delivering upon this strategy. Foster (2001) argues that the development of such a strategy should be the responsibility of a major economic ministry, such as Finance or Planning, in order to ensure that all relevant stakeholders

are involved and that the Ministry of Agriculture does not use it to entrench its existing role and responsibilities.

However, effective management and co-ordination of service provision can only really occur at local level (Foster, 2001), which is also where much of the relevant information is available for holding front-line service providers accountable for their performance. Thus, participatory development and monitoring of a national agricultural (or rural) development strategy should be mirrored by participatory development and monitoring of sub-sectoral and local-level agricultural (or rural) development plans. For major cash crops, stakeholder-designed sub-sectoral development strategies are appropriate, with private sector and farmers' representatives holding public agencies (for example, crop boards) accountable for their performance in accordance with these strategies. For food crops, the most appropriate planning level remains an open question. Whilst the wider trend towards administrative decentralisation suggests district-level planning as the basic building block, flexible co-operation across several districts (perhaps mirroring agro-ecological zones) may be necessary for some purposes. We also note that the resourcing problems (both personnel and finance) that afflict wider decentralisation efforts are likely to hinder effective local-level agricultural and rural development planning for some time to come.

Achieving informed and effective external accountability of public agencies in agricultural development is a long-term project. We believe that a twin-track approach is needed – in addition to (and integrated with) the improvement of internal management and control systems aligning staff incentives with organisational performance.

- First, national and local policy-making processes should create 'spaces' in which civil society (including farmer organisations, NGOs and private sector representatives) can hold public agencies to account. These should not be one-off meetings outside of mainstream policy-making and budgeting processes, but fora for regular interaction that are embedded within such processes. They should focus on the participatory development and monitoring of clear strategies and programmes against which performance can be assessed, and should build the trust necessary to achieve co-ordinated action by key stakeholder groups (Hall and Soskice, 2001).
- Second, investments should be made to strengthen farmer organisations, so that they can play an effective part in the policy-making and accountability processes at both national and local levels. Whilst one of the aims of decentralisation processes is to make public agencies more responsive and accountable to citizens, there is a danger that, without strengthened farmer voice, local administrations will be 'captured' by local elites, who are more experienced and better placed to influence officials.[27]

27. In fact, the ideal scenario for pro-poor service delivery may well be a mixture of decentralised control (to achieve local co-ordination) and top-down pressure from central governments committed to a poverty reduction agenda, so as to ensure genuine participatory practices by decentralised authorities, but also to ensure that national poverty reduction priorities are adequately taken into account.

8.2 Donor and government funding mechanisms to support external accountability

If policy processes and performance are publicly scrutinised and externally accountable at different levels as suggested above, this will provide some incentive for public agencies to change their internal management systems and organisational culture to become more outcome-oriented. (External help may also be needed here!) However, other incentives can also be brought into play.

At national level, whilst a number of leading donors may now be committed in principle to increasing their investment in African agriculture,[28] disbursal of additional funds at country level should depend upon there being a credible and coherent national agricultural (or rural) development strategy that was developed in full consultation with relevant civil society players and upon a commitment to let such players monitor the performance of public agencies in delivering on this strategy. This would provide a positive incentive for reform.[29] In addition, where a Ministry of Agriculture (say) was considered unfit in its current state to handle additional investment expenditure, additional emphasis could be given within that country to investment in rural infrastructure and/or the promotion and strengthening of farmer organisations. We note that these proposals assume that major donors have the capability of maintaining a common stand on such matters.

At local level, similar incentives could be provided to local government administrations by responsive funding windows that would provide complementary funding to that available through local taxes and the central government budget, for local initiatives carried out in accordance with a local-level agricultural (or rural) development plan. As above, eligibility for such funding, which would be competitive across jurisdictions (and possibly across neighbouring countries),[30] would depend upon there being a credible and coherent local agricultural (or rural) development strategy that was developed in full consultation with relevant civil society players and also a commitment to let such players monitor the performance of public agencies in delivering upon this strategy.

28. In the view of the current authors, this 'commitment *in principle*' is a key concept. For, whilst increased aid investment can be a strong positive incentive for domestic reform and commitment to poverty reduction through agricultural growth, supply-driven increases in aid to agriculture-related state agencies that were not committed to a poverty reduction agenda could simply undermine any incentive that they might otherwise have to make themselves accountable to sector stakeholders. However, activating the '*in principle*' part of the concept may require reforms in governmental budgeting processes within donor countries, such that aid agency funds can remain unspent in a given year without prejudice to future aid budgets.
29. There are direct parallels between the 'process conditionality' advocated here and the thinking underlying the development of the PRSP framework (Booth, 2003).
30. The Maendeleo Agricultural Technology Fund (www.maendeleo-atf.org), managed by FARM-Africa, provides an example of a responsive funding window dedicated to supporting agricultural innovation and development across three countries (Kenya, Tanzania and Uganda).

8.3 Reforming Ministries of Agriculture

Greater performance-orientation and accountability for public agencies also raise questions regarding their structure and their capacity to deliver on agreed strategies and programmes. Much has changed within the operating environment of Ministries of Agriculture, Livestock, Forestry and Fisheries in recent years (for example, the increased focus on poverty alleviation within public policy, market liberalisation, administrative decentralisation, greater recognition of livelihood diversification), but it is a widely held view that such agencies have not changed sufficiently to respond to new challenges (Hubbard, 2003). In addition, the emphasis placed on service delivery and co-ordination issues throughout this article suggests a very different institutional mindset from that displayed by a traditional paternalistic state agency – one that values, supports and works with other (non-governmental) players.

When the spotlight is shone on African Ministries of Agriculture, however, what is revealed is rarely encouraging. They are often inefficient, production- (rather than poverty-) focused and ineffective in negotiations related to PRSPs and medium-term expenditure frameworks (MTEFs) (Booth, 2003).[31] Reform within African Ministries of Health and Education is widely perceived to be ahead of that within Ministries of Agriculture, which some allege are seen by politicians more as vehicles of patronage than serious development organisations.

A key step in increasing the 'absorptive capacity' of African states for public investment in support of agricultural growth and poverty reduction is, therefore, the reform of Ministries of Agriculture and other related agencies. This is not the place to make detailed recommendations as to the path that reform should take. However, it is suggested that future Ministries should have some of the following features:

- generally smaller in terms of central staff – ideally enhanced in terms of skills – with central capacity focused on policy analysis and advice for national policy-making and on supporting (primarily through information provision and analysis)[32] decentralised planning processes;
- research, resourcing of front-line extension staff and price stabilisation functions handled by autonomous agencies accountable to the Minister on the basis of clear performance objectives;
- district officers and extension staff employed by and accountable to local government administrations, with their primary role being the development and/or implementation of local agricultural (or rural) development plans;
- Ministries of Agriculture, Livestock, Forestry and Fisheries possibly merged into one Ministry of Rural Development, with additional responsibility for the development of rural non-farm activity.

31. In addition, all these criticisms were levelled at Ministries of Agriculture by contributors to the 2004 DFID e-consultation on agriculture (http://dfid-agriculture-consultation.nri.org).
32. In the case of sub-sectoral development strategies, there may also be a direct role for Ministry officials within multi-stakeholder management bodies, such as crop boards.

A key issue raised by Foster (2001) is that Ministries of Agriculture have little incentive to co-operate with wider reform and poverty-reduction agendas if they believe that these will inevitably lead to their budget and responsibilities being cut. However, we believe that reformed public agencies have a central role to play in any strategy for poverty-reducing agricultural intensification and growth. If this is recognised at the outset, and it is clear that funding will flow where Ministries are equipped to make good use of it, the incentives for institutional reform should be greatly enhanced.

9 Cross-cutting issues: farmer organisations and the problems of remote and less favoured areas

This article has put forward an analysis of critical institutional and technical problems underlying the significant market constraints on pro-poor agricultural growth in sub-Saharan Africa, and suggested a wide range of actions by states and donors to promote engagement by private sector and civil society organisations to allow improved access by smallholder farmers to a range of services they need to increase their agricultural productivity and incomes. We conclude by discussing two cross-cutting issues which have been mentioned but not properly discussed in previous sections of the article: farmer organisations and less favoured areas.

9.1 Farmers' organisations

Farmer organisations (FOs) have the potential to play a critical role in both the delivery and co-ordination of services to smallholder producers. They provide a means for service providers to reduce the number of small-scale transactions they engage in with individual farmers, allowing the same volume of business to be concentrated in a smaller number of larger and more secure transactions. In performing this function, effective FOs not only help to reduce service providers' co-ordination costs and risk, they can also assist farmers in obtaining lower-cost, more reliable and co-ordinated delivery of extension, research, finance, input and output marketing services.[33] FOs also have an important potential role in strengthening client 'voice' in policy-making and accountability processes at both national and local levels.

However, experience with farmer organisations in Africa has so far been mixed. They can be diverted to serve the ends of a few influential people and may fail unless they can draw on the necessary skills and resources, and develop their own internal accountability mechanisms, to provide valued services for their members. However, in a number of countries there are now promising models that appear to create strong organisations capable of engaging both with commercial and public service organisations, following moderate inputs of outside training and facilitation (Bingen et al., 2003).

33. Initially at least, FOs are more likely to achieve 'preferred supplier' (or buyer) status for their members with large-scale buyers (suppliers) than they are to be able to bargain much over prices and/or terms. It is not clear what share of the benefits from lower transaction costs will be passed on to producers. We might expect formal buyers with large investments in processing or retail to pass on more of these transaction-cost savings than buyers within informal market systems.

Issues with the promotion of farmers' associations are:

- the need to establish and maintain a clear focus on activities that yield tangible benefits to farmers, that demand resources and skills available to farmers, and that can fit into commercial opportunities in the wider economy (Stringfellow et al., 1997).
- Governance and leadership accountability are important requirements for strong, independent associations. Can large numbers of strong associations develop, given these requirements and the observation that external promotion of groups may undermine member ownership and hence strength (ibid.)? The CLUSA model of farmers' associations developed in Mali, Zambia and Mozambique appears to offer the potential of strong, semi-independent associations at low cost and in fairly quick time (Bingen et al., 2003), although it is not yet clear what proportion of smallholder producers might be expected to participate actively in such associations, which are (almost inevitably) geared to surplus producers.
- Some states (Tanzania, for example) still have Ministries of Co-operatives, which aspire to lead and control the formation of FOs – hence stifling it! Governments should recognise that there are few, if any, African success stories of state-led FO development, although state organisations may be associated with the development of 'linkage-dependent' groups with more limited and specific objectives (for example, credit access within a supported 'critical' supply chain). Will states allow (indeed support) NGOs and other organisations to promote genuinely independent FOs that could one day become political entities?

9.2 Support for producers in less favoured areas

The arguments presented in most of this article are perhaps applicable first and foremost to areas of higher agro-ecological potential within Africa. (Unlike Asia, Africa has yet to realise much of the potential even of its high-potential areas.) In 'less favoured' areas (a term used to include both areas of low agro-ecological potential and areas remote from major market centres), smallholder agriculture is less likely to function as a driver of growth, yet it performs vital food security and welfare functions. Agricultural and rural development and poverty reduction policies must recognise that smallholder agriculture will continue to perform these vital roles until the efficiency of rural food markets increases considerably and broader employment opportunities expand to a similar degree. Furthermore, these areas' natural resource base, on which such agricultural activity depends, is being degraded more or less rapidly by the growth of populations that still rely to some degree on semi-subsistence agriculture. Sustaining and indeed enhancing the ability of poor households to meet their food needs through own production, and the maintenance and protection of the natural resources they manage, requires intensification supported by public investment, just as in higher-potential areas. Of course, the nature of the intensification will be different (for example, with greater emphasis on soil and water conservation, less on purchased inputs), as will the role of public support services (for example, greater emphasis on

supporting common property resource management and different emphases within livestock support services). However, the basic case for continuing investment in the agricultural sector is the same, as are many of the fundamental market access and co-ordination problems and solutions, although the challenges, and costs, in these areas are likely to be much greater.

10 Taking the agenda forward

This article has presented a broad agenda for agricultural market development in Africa that responds to the general but pervasive challenges of thin markets and resulting low-level equilibrium traps. Detailed actions should be worked out on a country-by-country basis and, partly for this reason, the article has given the same weight to process issues as to priority areas for action. The arguments in the article suggest that major investments do indeed need to be undertaken if agricultural markets are to be 'kick-started' in Africa. However, the most fundamental constraints are institutional, not financial. New institutional arrangements are required at, at least, two levels, to provide:

- the co-ordination necessary to encourage private investment in the context of thin markets and low-level equilibrium traps;
- the incentives for state agencies to work with private stakeholders to overcome the various co-ordination challenges.

One school of new institutional economic thought suggests that institutions are created (by private or other actors) in response to market failure, so as to overcome it. However, North (1990) argues that the powerful do not always perceive it to be in their interests to create such institutions. The question then arises as to whether the incentives can be created for them to contribute to the process of pro-market institutional development.

In our analysis, market constraints on pro-poor agricultural growth in sub-Saharan Africa will only be overcome if the state plays a pro-active role that goes beyond the provision of classic public goods (infrastructure, agricultural research, contract enforcement, etc.). This contention is not yet established within international development 'orthodoxy' and we suggest that further intellectual effort could usefully be expended on the examination of issues of co-ordination and their implication for (agricultural) development policy. Arguments for a pro-active state role do, however, accord with the ideological beliefs of many of Africa's political elite (van de Walle, 2001). On the other hand, the nature of the role envisaged here – working in collaboration with a range of other stakeholders (commercial private sector farmers' organisations, NGOs) to 'kick-start' agricultural markets – is unfamiliar and will be uncomfortable for many within state organisations. Thus, whilst a pro-active state role is essential, there are likely to be as many vested interests within the state opposing the creation of new institutional arrangements as striving for them.

Reform elements within the state apparatus may be both technocrats and politicians. They may be found within Ministries of Agriculture, but also within other ministries, such as Finance, Trade or Local Government, that have regulatory

responsibilities relevant to the agricultural sector. These reform elements can increase the pressure for enhanced public sector performance within the agricultural sector by:

- creating fora (both national and local) in which other stakeholders are given the right to contribute to policy-making, priority-setting and monitoring of policy implementation;
- signing up to additional forms of external accountability (for example, NEPAD peer monitoring mechanisms);
- engaging in regional initiatives, such as free trade zones, which are then binding on domestic policy.

In addition, our analysis suggests that donors can support such efforts in two main ways. First, they can use a commitment in principle to increased funding of agricultural and rural development to provide an incentive for institutional reform. This requires the extension of process conditionality from overall development policy-making (PRSPs) to the agricultural sector, and may also mean accepting that not all aid will be given in the form of direct budget support, at least for the time being. Secondly, they can provide increased funding for the strengthening of civil society organisations and, specifically in the current context, farmers' organisations, to enable them to play a more effective role not just in agricultural service delivery but also in policy advocacy and implementation monitoring. Ultimately, agricultural development in sub-Saharan Africa has proceeded as slowly as it has because smallholder households have limited political voice. Strengthening that voice is essential if the recent momentum towards agricultural (market) development is to be sustained or, preferably, accelerated.

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