



# The changing context and prospects for agricultural and rural development in Africa

A Working Paper from the joint evaluation of AfDB  
and IFAD policies and operations in agriculture and  
rural development in Africa



Enabling poor rural people  
to overcome poverty

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Evaluation team\*

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\* This paper was produced by Mr Hans P. Binswanger-Mkhize and Mr Alex F. McCalla in July 2008. The views in the document represent the opinions of the authors and not necessarily those of IFAD's Office of Evaluation and AfDB's Operations Evaluation Department.

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# Abbreviations and acronyms

AATF	African Agricultural Technology Foundation
AfDB	African Development Bank
CAADP	Comprehensive Africa Agriculture Development Programme
CGIAR	Consultative Group on International Agricultural Research
ECA	Economic Commission for Africa
FAO	Food and Agriculture Organization of the United Nations
FARA	Forum for Agricultural Research in Africa
GDP	Gross Domestic Product
IFAD	International Fund for Agricultural Development
IFPRI	International Food Policy Research Institute
NEPAD	New Partnership for Africa's Development
NGOs	Non Governmental Organizations
OECD	Organisation for Economic Co-operation and Development
R&D	research and development
WHO	World Health Organization
WTO	World Trade Organization

## Foreword

This review of the changing context and prospects for agricultural and rural development in Africa was commissioned as part of the joint evaluation by the African Development Bank (AfDB) and the International Fund for Agricultural Development (IFAD) of their policies and operations in agriculture and rural development in Africa. The main purpose of the evaluation was to document the evolution of and trends in African agriculture and rural development over the past 25 years, identify the key opportunities and challenges that exist today in improving agricultural growth and promoting food security, and assess the future implications for the work of the two organizations in Africa.

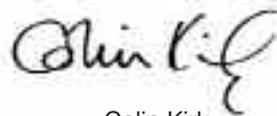
The evidence contained in the review suggests that Africa has made significant progress towards achieving the Millennium Development Goals (MDGs) and that prospects are encouraging for a better future for the millions of poor people who live on the continent. However, significant challenges remain: promotion of a stable policy and governance environment, deeper engagement with the private sector, greater attention to the involvement of women, and investment in research and technology to enhance the productivity of small and marginal farmers. The current economic downturn and volatility in food prices have not spared Africa; indeed they have served to compound the challenges faced by the region.

The review contains a wealth of data, analysis and reflections and has been well received in the international development arena. We believe it can serve as a core reference document for a broader audience of academics and researchers, development practitioners and policymakers, and all those working towards meeting the MDGs. As such, IFAD and AfDB felt that the review merited production as a stand-alone publication. Moreover, given the quality of the analysis, a more detailed review will be included as part of the forthcoming updated edition of the Handbook on Agricultural Economics, edited by Robert Evenson and Prabhu Pingali.

We would like to express deep appreciation to the two main authors of the review: Mr Hans P. Binswanger-Mkhize, Honorary Professor at the Institute for Economic Research on Innovation at Tshwane University of Technology, Pretoria, South Africa and Mr Alex F. McCalla, Professor Emeritus, Agricultural and Resource Economics, University of California, Davis, USA.



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## Executive summary

We undertake this task in a period of optimism about the prospects for Africa and for African agriculture and rural development. Per capita economic growth is now above three per cent, and per capita agricultural growth above one per cent. Armed conflicts are down to 5 from 15 in 2003. While there are setbacks, such as the recent Kenya and Zimbabwe crises, democracy has advanced significantly. The business environment in sub-Saharan Africa now has faster progress in its business environment than in the Middle East and North Africa region or Latin America (World Bank and International Finance Corporation, 2006). Africa is in the process of strengthening its regional and subregional institutions. Agriculture had returned to the forefront of the international development agenda even before the recent spike in food prices, and is even more of a priority as a consequence. The African Union, in conjunction with the New Partnership for Africa's Development, has developed the Comprehensive Africa Agriculture Development Programme and is encouraging countries to allocate more fiscal resources to agricultural development. Although the recent sharp rise in international food prices is increasing poverty rates and food import bills in the short run, in combination with economic growth it is also creating major opportunities for African farmers in domestic, regional and international markets.

The purpose of this context-and-prospects review of African agriculture is to report on the ongoing joint evaluation of International Fund for Agricultural Development (IFAD) and African

Development Bank (AfDB) policies and operations in agriculture and rural development. The study: (i) identifies major policy, sector and subsector issues in this area from both an African and a global perspective; (ii) analyses, drawing on lessons from the past three decades, issues likely to be of relevance for future development assistance to the sector; (iii) identifies specific issues and regional priorities that are most relevant to IFAD and AfDB policies and operations; and (iv) makes recommendations on issues to be given further attention in the course of the evaluation.

This context paper comes at a time when many others have summarized the state of knowledge on food and agriculture, including the Food and Agriculture Organization of the United Nations (FAO) (2007), International Food Policy Research Institute (IFPRI) (2006), InterAcademy Council (2005) and World Bank (2007). There are also recent studies on governance failure, conflict and natural resource dependence (Collier, 2007); governance and regional integration (Economic Commission for Africa) (ECA) (2006); and, in particular, the causes and consequences of the recent food price rises (FAO, 2008; Organisation for Economic Co-operation and Development (OECD) – FAO, 2008; IFPRI, 2008). This context paper draws on the wealth of knowledge found in those studies.

Section 1 reviews the appalling legacy which the past failure to grow and the neglect of agriculture have left behind in terms of poverty and hunger, as well as examining the powerful role that agricultural growth can and has played

in dramatically reducing poverty and hunger elsewhere in the world. Section 2 covers changes in the international and institutional landscape that affect the prospects for African agricultural and rural development. Section 3 analyses the global winds of change that have significantly altered the environment for agricultural development, in particular the causes and the short- and long-term consequences of the recent sharp increases in international food and agricultural prices. Section 4 then turns to developments in Africa. Long-standing constraints on African economic and agricultural growth are discussed, together with the changes in macroeconomic and other policies that have brought about the recent turnaround and successes. In section 5, we focus specifically on the plight of the “bottom billion” countries, which remain mired in low growth. In section 6, we turn to the institutional pillars that need to be in place for agricultural and rural development, including the respective roles of the private sector, communities, local government, and central and subregional institutions. Section 7 covers new market opportunities for African farmers arising from the higher price levels at which international prices are expected to settle after the current spike. It then goes on to review the challenges faced by Africa in consolidating the recent turnaround and seizing those opportunities.

### **The legacy of the past failure to grow and of the neglect of agriculture**

Except for North Africa and selected countries in sub-Saharan Africa that have joined the ranks of the middle-income countries, growth in sub-Saharan Africa has lagged behind all other regions in the world and is characterized by low investment and productivity growth. As a consequence, rather than being reduced over the

past five decades as elsewhere in the world, poverty and hunger have deepened in Africa. Among Africa’s regions, poverty, hunger and HIV/AIDS are significantly worse in East, Southern and Central Africa than in North and West Africa. In those regions where growth has recently picked up, poverty has fallen, although only those with higher agricultural growth have seen a decline in hunger.

Landlocked, resource-poor countries have had the slowest growth rates. Slow growth has also been a consequence of the delay in the demographic transition, which resulted in very high dependency rates. Poor governance, macroeconomic instability and limited integration into global markets sharply reduced growth until the mid-1990s, when these conditions started to improve significantly. Today they are less of a negative factor. Instead, structural impediments are now the elements that continue to impede a further acceleration of growth: infrastructure (roads, electricity, water supply) is poor, transport costs are high, and the cost of doing business is much higher than in other parts of the world. Financial markets in general and rural finance in particular are very poorly developed, and savings rates are much too low.

Until very recently, agriculture in much of Africa was given short shrift in macroeconomic, trade and agricultural policies and was starved of fiscal resources. Even at the height of donor support for agriculture in the 1980s, foreign aid, apart from often being poorly designed, was insufficient to compensate for these negative policies and lack of domestic resources. This situation became even more acute after the dramatic decline of such aid in the 1990s and early years of this century. The combination of these negative factors has prevented agriculture from contributing fully to growth or to the types of dramatic reductions in poverty and hunger seen in East and South Asia.

## Global winds of change

Global winds of change provide significant opportunities, such as those opened up by the biotechnology revolution and, in the longer run, by the production of biofuels, as well as significant impediments and threats, such as those represented by the failure of the Doha Round of trade negotiations to start dismantling OECD agricultural subsidies and trade barriers, or the anticipated adverse impact of climate change on agricultural productivity. While the Bali discussions on climate change hold out the promise of support for mitigation and adaptation in poor countries, the mechanisms and funding to do so have yet to materialize. Dramatic changes are also occurring in the consolidation of private international agribusiness firms and the associated supermarket revolution that is thus far being driven by African players in sub-Saharan Africa. The privatization of much agricultural research as a consequence of the biotechnology revolution is an equally radical change.

The biggest global shock, and the most complex mix of new opportunities and new problems, derives from the recent dramatic rise in global food prices. Aggregate food prices, including grains and oilseeds, have risen by approximately 60 per cent in real terms, and the prices of individual commodities have in some cases risen even more sharply. The peak prices occurred mostly in the first six months of 2008, and prices have dropped even faster than they rose as a consequence of the global economic crisis. However, at the time of this writing in November 2008, on average they are still over 60 per cent higher than in the early years of this century. This increase in real food prices comes after decades of continuous decline – but although real aggregate prices have risen more sharply than during the food crisis of the early 1970s.

The rise in food prices has been driven by a combination of structural changes in conditions

of supply and demand. This situation has been exacerbated by weather shocks, the dramatic rise in energy prices and low interest rates that may have triggered additional speculative behaviour. On the demand side, rapid growth and rising incomes in emerging economies such as India and China have pushed up demand growth. Urbanization and global growth are generating demand for a larger and more varied food supply. At least some of the increase in biofuel demand will remain in place for some time to come. On the supply side, the rate of increase has slowed over the past decade because of declining productivity growth and greater competition for water and land. Investments in agricultural research and development have declined globally. Finally, higher petroleum prices have locked in higher production costs. As a consequence of all these trends, global grain consumption has exceeded global production in seven of the last eight years. The result has been a drawdown of stocks to critically low levels. Thus, the weather shocks of the past three years have combined with the dramatic surge in biofuel production to cause a sharp increase in prices.

Are higher prices here to stay? The extensive body of literature that is emerging on this topic is reviewed in Section 3. The conclusion set forth in the *OECD-FAO Agricultural Outlook* (2008) comes the closest to our reading of the literature: “World reference prices in nominal terms for almost all agricultural commodities covered in this report are at or above previous record levels... This will not last and prices will gradually come down because of the transitory nature of some of the factors that are behind the recent hikes. But there is strong reason to believe that there are now also permanent factors underpinning prices that will work to keep them both at higher average levels than in the past and reduce the long-term decline in real terms.” (p. 11).

In the short run, higher food prices are exacerbating the situation for poor urban

populations and for poor net buyers of food in rural areas, especially in food-importing countries that have few options in trying to prevent a pass-through of international prices to consumers. Africa's food import bills will rise by more than one per cent of GDP in most North, East and Southern African countries and a few West African ones. At the same time, many of these countries are being hit even harder by higher global energy prices. The spike in food prices therefore required urgent action in the form of safety nets and balance-of-payments support. Neither IFAD nor AfDB is active in these areas, however.

In the longer run, once food prices have stabilized, they will provide improved opportunities for African farmers, particularly as domestic and regional markets will expand because of rising incomes. In these markets, farmers compete on the basis of import parity prices, rather than lower export parity prices, and have to deal with fewer quality and phytosanitary barriers. African farmers have a major opportunity to win back markets lost over the past decades. Internationally, changing food demand and supply patterns will lead to more South-South trade, which in the long run will bolster domestic and regional market opportunities. Of course, their ability to seize these opportunities will depend on many of the factors reviewed in this paper. IFAD and AfDB can make significant contributions to urgently needed supportive policies and programmes.

## **African growth and agricultural trends**

Section 4 analyses important recent improvements in Africa and opportunities that are being opened up for Africa's rural people by several favourable trends. Since 2002, the number of armed conflicts has fallen significantly. Better macroeconomic management, an improved

business environment and a more appropriate division of labour between the public and private sectors have brought down fiscal deficits and inflation and accelerated growth. Significant advances in democracy, combined with stronger civil-society, community and farmers' associations, have made governments more accountable to their populations. Africa has built stronger regional and subregional organizations, both at the political level and in the field of agricultural research. New private and emerging-economy donors are providing growing volumes of aid.

Positive agriculture-specific trends include significantly improved price incentives for agricultural producers as a consequence of unified exchange rates, lower levels of industrial protection and sharply reduced export taxation. Higher international commodity prices may be here to stay and, if this proves to be the case, will create growing opportunities for import substitution and regional agricultural trade. Finally, African governments, regional institutions and development partners are – at least in words – showing a stronger commitment to agricultural and rural development. These positive trends have accelerated per capita economic and agricultural growth and reduced the numbers of poor people in the fastest-growing countries. Unfortunately, except in North and West Africa, they have not yet translated into measurable reductions in hunger and malnutrition.

Advances have been less satisfactory in the case of the persistent HIV/AIDS crisis, as well as in dealing with several stubborn conflicts that have defied resolution: improving governance and increasing decentralization and moving forward with regional integration, which has been hampered by the underfunding of regional and subregional organizations. In addition, national governments' budget allocation for agricultural and rural development remain insufficient, and advances in constructing the

infrastructure needed to link landlocked countries and remote coastal regions to demand centres and harbours have been slow.

Progress in fostering widely shared agricultural growth has also been impeded by poorly developed financial markets and rural finance institutions. Development of competitive output and input markets is limited as well. Services for smallholder agriculture remain inadequate. Competition for natural resources (soil, water, fisheries and forests) is increasing, and management of these resources is improving slowly, if at all. Progress in the field of biotechnology has been insufficient, and this – together with persistent underfunding of agricultural research, agricultural extension and institutions of higher learning – condemns agriculture in sub-Saharan Africa to slow and insufficient technical change, thereby widening the technology divide.

Clearly, both AfDB and IFAD will have to focus closely on growth in their future programmes, in particular on widely shared growth that includes rural areas. Ndulu et al. propose a medium-term growth strategy that hinges on taking action in four areas (characterized as the four “I’s”): improving the investment climate; undertaking a big push to close the infrastructure gap with other regions of the world; focusing more on innovation as the primary motor for productivity growth and enhanced competitiveness; and building institutional and human capacity (Ndulu et al., 2007).

### Opportunities and constraints

As the volume and quality of aid from traditional donors have stagnated, the rate of increase in financial commitments for agricultural and rural development from national governments has remained slow. In general, African countries have placed far more hope on donor support for their

agricultural and rural development programmes than is warranted by (i) the past volumes and quality of aid, (ii) insufficient donor specialization and coordination, (iii) the extent of follow-through on recent aid commitments, and (iv) the modest scale of improvements in donor behaviour over the past two decades. The growing fiscal capacity arising from rapid economic growth offers a major opportunity for change.

### The new aid architecture

Rather than falling back on the idea of financing agricultural and rural development via donor support, the proliferation of new donors provides some opportunities to complement domestic resources with donor finance. However, countries will continue to experience difficulties in coordinating multiple old and new donors. Ways must be found to ensure that potential new donors and aid recipients conform to national development and sector policies, strategies and plans. But their entrepreneurial drive and ability to raise and deploy resources without taxing government capacities should be encouraged, as has long been the case with donations from foreign religious institutions of all faiths. The burden of compliance with national policies could be put squarely on the recipient of funds, combined with ex-post “audits” to verify that policies have been adhered to. This would help reduce the donor coordination burden. Of course, for larger government and multilateral donors, including AfDB and IFAD, the coordination agenda of the Rome Declaration on Harmonization and the Paris Declaration on Aid Effectiveness remains fully in place.

The proliferation of new donors and renewed emphasis on agriculture and the rural poor should provide an excellent opportunity for IFAD to broaden and deepen its donor base, especially in light of its highly relevant mandate, strategy and policies. AfDB, on the other hand, would

have to articulate a more clearly focused agricultural and rural development strategy in order to do so.

In terms of the Rome and Paris agendas, the two institutions should emphasize the following issues:

- (i) AfDB and IFAD agricultural and rural development programmes should derive from poverty reduction strategy papers and associated analytical work on poverty, domestic institutions, programmes and expenditures.
- (ii) While it is tempting to contemplate joint AfDB–IFAD country strategies, the importance of putting the countries in the driver’s seat and economizing on scarce analytical skills in both institutions suggests a different approach, whereby support for agricultural and rural development strategies should be provided in coordination with other donors such as the European Union, World Bank and United States Agency for International Development (USAID).
- (iii) National budgeting and fiduciary systems should be upgraded and used as the framework for harmonizing procedures across donors, while eventually moving to budget support.
- (iv) As emphasized in the IFAD policy paper on sector lending, using national budget and fiduciary systems may be more difficult to do in the case of agricultural and rural development than for health and education. Nevertheless, it is possible to make progress.
- (v) Financing for subnational governments and communities should be channelled through scalable local and community-driven development projects and via the intergovernmental fiscal system.

### **Focusing on the bottom billion**

The enormous costs to the populations of the bottom billion countries and to their neighbours implies that both AfDB and IFAD may need to focus more on the countries and on the root causes of the problems. An enhanced focus on countries, especially those in pre- and post-conflict situations, will entail relaxing rigid lending allocation rules that can turn bottom billion countries into aid orphans and increasing the risk of grant and lending operations. Such risks can be mitigated by enhancing supervision, and therefore supervision budgets may need to increase in these settings. IFAD’s shift towards supervising more of its operations directly is therefore a most welcome change. Finally, both institutions may need to time their operations more carefully, focusing on rapid provision of technical assistance following an incipient turnaround or conflict resolution, followed by a strong shift to investment lending. Stronger coordination of capacity-building and investment lending with other major players will also be needed.

### **The capacity of agricultural and rural institutions**

Compared with the situation in 1980, the institutional environment for agricultural and rural development has improved significantly. The role of the private sector, including producers’ associations, has expanded dramatically, although the private-sector response has not yet altered input and output markets sufficiently to create a vibrant and competitive environment for small farmers. Communities and civil society organizations have greater opportunities to participate in development and are receiving domestic and foreign support. While most governments have decentralization initiatives under way, administrative and fiscal decentralization lags far behind political decentralization. The sector institutions

responsible for setting and monitoring policy and financing or providing services for small farmers remain largely ineffective, however. It is now widely understood that these four sets of institutions need to collaborate at the local level as co-producers of local and community development, including agricultural development, via public-private partnerships and other mechanisms. Such collaboration needs to be led and fostered by central government, which continues to have overall policy and financing responsibilities and which needs to drive further decentralization and public-sector reform.

While there are no studies that measure the impact of the strengthened institutions on agricultural growth, there is little doubt that these improvements, in addition to macroeconomic stability and better price incentives, are one of the reasons for the recent acceleration of agricultural growth.

Building the capacity of agricultural and rural institutions can best be done in the context of a broader, national capacity-development strategy and programme. It cannot be done as a top-down provision of capacity-development services. Rather, it involves learning by doing, whereby communities, local governments, farmers' organizations and private-sector actors are given opportunities and resources and can exercise control over their own development. Of course these actors should be provided with mandatory training, in particular in diagnosis and planning, financial management and reporting, procurement, and monitoring and evaluation. Other training should be provided largely on a demand-driven basis. Capacity development must build on the considerable latent capacities that are found in rural areas all over the world. To do so, rules and regulations for programme execution must become much more participatory and empowering and should eliminate complex features that destroy latent capacity or hinder its mobilization (Binswanger and Nguyen, 2004). Finally, the

broader sector institutions involved in agricultural and rural development need to become much more accountable to their clients.

AfDB and IFAD have important opportunities to foster the institutional environment for agricultural and rural development. Influencing rural institutions should be part of the country and regional strategy development of both. AfDB has a full range of instruments to foster institutional development at a national level through both policy change and capacity development. IFAD's impact is likely to be more selective, as in building the capacity of local governments in rural development, empowering communities and farmers' associations, and fostering local public-private partnerships.

### **Innovation and scaling up**

For IFAD, innovation should be redefined as "innovation for scaling up targeted programmes for the rural poor". Rather than focusing on individual innovations, this would involve putting packages together using best international practices to reach the target group and improve incomes and food security, along with selective innovations in areas where international best practice is not yet satisfactory, such as rural finance. Innovation would then involve testing and perfecting integrated approaches on a sufficiently large scale so that they could be scaled up nationally. Its analytical capacity and work programme should also be sharply focused on these tasks, rather than attempting to cover all issues associated with agricultural and rural development. Collaboration with AfDB in these areas would be of great advantage to both institutions.

### **The remaining challenges of agricultural incentives**

A number of issues remain to be resolved: A declining number of countries in the region continue to pursue disastrous macroeconomic policies; Zimbabwe is an example. Elsewhere,

inflation remains stubbornly high, leading to high real interest rates that make it difficult for agriculture to compete for investment resources. Although, on balance, protection rates are no longer negative, net protection rates remain below minus 10 per cent in Côte d'Ivoire, Ethiopia, the United Republic of Tanzania, Zambia and Zimbabwe. Unlike industrial products and importable agricultural products, agricultural exportables continue to have zero or negative protection. Agricultural products and inputs suffer from excessively high transport costs on account of poor infrastructure, policy interventions and illegal road blocks. Agricultural incentives also suffer from barriers to interregional trade and poor phytosanitary capacities. Finally, while improving, business climates in most countries still remain far worse than in other developing countries, holding back private-sector activities upstream and downstream from the farm. Efforts to improve the many dimensions of incentives for African agricultural producers should be pursued by both institutions as and when opportunities arise in the course of their advisory or project work.

### **Rural finance**

Given the extremely adverse environment for rural finance in most of Africa, it is not surprising that both IFAD and AfDB have found it excruciatingly difficult to achieve success in this area, although both of them place rural finance high on their agendas. We believe that solutions to farm investment issues need to come from better agricultural incentives and profits so that farmers can reinvest the latter in their farms. This approach can be supported by easily accessible, low-cost savings mechanisms, such as postal savings systems linked to rural savings clubs. A complementary approach would be to finance more agricultural and rural investments via matching grants funded by both community contributions in kind and individual savings.

### **Agricultural science and technology**

Despite good returns on agricultural research in Africa, the science and technology divide between agriculture in sub-Saharan Africa and the rest of the world is growing because of inefficient and underfunded science and technology institutions in the region and rapid changes in the international research environment for biotechnology and private agricultural research. Borrowing opportunities from other regions and elsewhere within the continent are constrained by the uniqueness and the heterogeneity of African agricultural environments. Combined with a relatively poor climate and resource base and the large number of stressors on productivity, this region requires more rather than less research. The challenges of natural resource management, climate change and growing climate risks only add to this imperative.

Fortunately, African leaders have started to respond to this challenge by creating consensus on what needs to be done, improving their national institutions of higher learning and research, building subregional and regional agricultural technology institutions, and developing biotechnology networks and institutions. Pillar 4 of the Comprehensive Africa Agriculture Development Programme provides a vision and an action plan for science and technology relating to African agriculture. Unfortunately, the significant institutional responses have so far not been matched by adequate funding from national government and international donors, especially in the areas of biotechnology and science education. While AfDB and IFAD are contributing financing at regional, subregional, national and project levels, it is clear that they, like others, will need to step up their contributions.

## The imperative of regionalization

Throughout this paper, many critical issues are explored that can be best, or only, solved by regional action. Several examples follow:

- I the small countries that dominate the African scene often lack financial capacity for public goods investments;
- I small landlocked countries generally do worse and depend on regional integration to be able to do better;
- I expanded regional trade in agriculture and food products is good for growth, farmer's incomes and regional food security; the short-term management challenges of the current food price spike and the long-term opportunities arising from prices that are expected to settle at higher than past levels only add to this imperative;
- I efforts to augment regional trade and food security will be aided by the harmonization of standards and sanitary measures and bolstered by subregional and regional capacities for their implementation;
- I more open borders and internal infrastructure should encourage private-sector traders;
- I for small countries, regional infrastructure – roads, communications, ports – is critical for access to each other's and external markets;
- I reversing land degradation and desertification and preserving biodiversity require transboundary collective action;
- I management of crucial but endangered forestry and fisheries resources must be approached on a transnational basis;
- I defence against plant and animal disease epidemics require collective responses at subregional and regional levels;
- I success in agriculture crucially depends on indigenous scientific capacity to generate new technology, and since many countries are small and poor, this is far better done

on a regional or subregional platform: the Forum for Agricultural Research in Africa and subregional organizations are on the right track but the effort needs to be greatly expanded;

- I biotechnology research is expensive and requires a large critical mass; therefore, the combined efforts of two or three regional institutes will be far superior to those of 48 or 24 underfunded, under-resourced national institutions;
- I indigenous scientific capacity requires trained people, which, here again, is better done by regional institutions which have the critical mass and necessary financial support; and
- I regional approaches to rural financial architecture may increase potential deposits and loanable funds and may spread risk.

These examples are, it is hoped, sufficient to illustrate that the potential for regional approaches and an overall regional strategy for rural Africa are significant. Yet, in most of these areas, institutional development programmes remain massively underfunded. The main reason for this is that regional efforts produce regional and subregional public goods, and their financing is therefore subject to the well-known problem posed by free riders in the financing of public goods. Except in the case of the largest countries, which have an incentive to supply themselves with these regional public goods, countries will seek to benefit from the investment of others. It is precisely here that a regional development finance institution such as AfDB has a major opportunity to step in, as it can both coordinate and contribute to the financing of these essential regional capacities.

While there is probably less of a role for IFAD in this area, it is already active in hosting the Global Mechanism of the United Nations Convention to Combat Desertification; AfDB has

fully recognized this comparative advantage, in general, and can become much more active in supporting cross-border agricultural collaboration. To effectively exercise a leadership role, it needs to develop the necessary analytical and implementation capacity, as well as streamlined mechanisms for financing them that are not dependent on individual country borrowing decisions.

### **Issues for the AfDB-IFAD joint evaluation of agricultural and rural development**

A number of issues have emerged that merit further analysis in the AfDB-IFAD Joint Evaluation of Agricultural and Rural Development in Africa. These issues are listed in the following points:

- (i) We have highlighted the considerable differences that exist between the comparative advantages of the two institutions in terms of their commitment to agricultural and rural development and the level of development of their strategies in that area. Questions to be addressed include the following: How can the two institutions design a common overall strategy for agricultural and rural development in Africa that combines their strengths, and how can such a strategy be translated into country-specific and regional support? A strategy of this sort could explicitly reflect the “Ndulu priorities”: investment, infrastructure, innovation and institutions (Ndulu et al., 2007).
- (ii) How can the two institutions take advantage of the renewed interest in agriculture on the part of governments and the international community that is being fuelled by the current food crisis

and the enhanced agricultural prospects for Africa arising from higher agricultural prices?

- (iii) How can a common overall strategy be translated into country support strategies for agricultural and rural development that are led by the countries and that assist the countries in coordinating all major donors?
- (iv) What are the opportunities that arise from the recent upsurge in China’s and India’s involvement in Africa for agricultural and rural development and for AfDB and IFAD? How can resources from other new donors be harnessed and contribute to AfDB-IFAD financed programmes?
- (v) Given the proliferation of donors, the fragmentation of aid and the high transaction costs associated with current aid delivery mechanisms, should AfDB and IFAD give higher priority to sector-wide approaches (SWAPs) and focus on capacity-building for aid coordination and a new approach to technical assistance within the agricultural and rural development sector?
- (vi) How can IFAD and AfDB expand their role in preventing States from failing and in contributing to the recovery of bottom billion States?
- (vii) How can AfDB and IFAD support the improvement of the institutional environment for local and community-driven development? In particular, how can they foster greater progress in administrative and fiscal decentralization, and how can they scale their own financial support to local governments, communities and other local actors? How can they merge their support in this area? With whom do they need to collaborate and how?

- (viii) How can AfDB support the wide variety of regional and subregional initiatives and institutions seeking to promote agricultural and rural development and, in particular, those that facilitate intraregional trade in agriculture and promote science education and biotechnology? With whom should they collaborate in terms of analysis and technical support, and how should they structure their financial support to strengthen country incentives to cofinance these institutions at an appropriate level? How will AfDB have to change its own regional financing tools to enable it to take a leading role?
- (ix) How can AfDB and IFAD help build the local, national and regional mechanisms and institutions required to take advantage of future opportunities arising in connection with climate-change compensation and adaptation funds?
- (x) How can AfDB best support advocacy for international and regional trade reform?
- (xi) How can IFAD and AfDB assist small farmers to take advantage of growing opportunities in domestic and subregional food markets? More specifically, how can AfDB and IFAD provide more support for the development of efficient and competitive input and output markets and supporting systems and for the integration of small farmers into them? Should IFAD and AfDB provide support in terms of research and technical support only, or also in the form of financial support?
- (xii) In light of the emergence of international supply chains and the revolution in food retailing, what can IFAD and AfDB do to assist small farmers to participate in the corresponding supply chains?
- (xiii) Should the new development opportunities offered by the international fair trade and organic food movements be accorded special importance in IFAD and AfDB operations?
- (xiv) Given the adverse rural finance environment existing in a large part of Africa, how much emphasis should AfDB and IFAD place on strengthening rural financial institutions? How should they go about doing so, and how should they collaborate with each other and with other actors to this end? To what extent can they expand the use of matching grants to strengthen the financial capacities of small farmers?
- (xv) How can IFAD and AfDB collaborate with others to protect Africa's coastal fisheries from the predatory practices of rich countries' industrial fishing fleets?
- (xvi) What should the role of AfDB and IFAD be in promoting further reform in land and gender rights, institutions for land administration and land redistribution? How should they go about fulfilling this role?
- (xvii) How can AfDB and IFAD more effectively partner with other major players in agricultural and rural development in Africa, particularly the World Bank and the European Union, and, in the longer run, with Brazil, China and India?



# The legacy of poverty and hunger left by the past failure to grow and the neglect of agriculture

Africa is second only to Asia in its size and heterogeneity. It includes Mediterranean climates in northern and southern Africa, subtropical and tropical highlands, the world's largest deserts, and vast stretches of arid, semi-arid, sub-humid and humid tropical areas. Of Africa's 900 million people, about two-thirds live in villages and small rural towns. The continent has a larger proportion of very small and landlocked countries than any other region of the world. Across the continent there are significant differences in culture and historical backgrounds, education levels and population trends. Economic growth has differed widely across countries and over time. These large differences across and within countries give rise to different development and growth opportunities. In this paper we pay particular attention to how these differences have influenced overall and agricultural growth, performance and prospects.

"[Sub-Saharan] Africa has the highest incidence of poverty of all developing regions. It accounts for 10 per cent of the world's people, but is home to 30 per cent of the world's poor... It is at the bottom of the United Nations Development Programme's human development index, reflecting low levels of education, health, and economic welfare." (World Bank 2005a, p. 1). Around 200 million of Africa's 900 million people are undernourished, and 33 million children go to bed hungry every night. Over the past 45 years, per capita income in sub-Saharan Africa has grown by only 0.5 per cent per year, compared with 3 per cent in the 57 countries making up the rest of the developing world

(including North Africa). As a result of the slow growth in per capita income in sub-Saharan Africa, poverty there has failed to decline between 1990 and 2003. Urban poverty is increasing as well, but more than 70 per cent of the continent's poor still live in rural areas. In addition, poverty rates in rural areas are still much higher than in urban areas. The rural poor include small-scale farmers, nomads and herders, artisanal fishers, wage labourers, households headed by women, unemployed youth, entirely landless people and displaced persons. The impact of growth on poverty reduction is well illustrated by the cases of eight sub-Saharan African countries that have seen per capita growth rates of 2.9 per cent, on average, in the 1990s and have reduced poverty at an annual rate of 1.5 per cent during the period (Ndulu et al., 2007).

On the other hand, poverty in economically stagnating countries has increased. Economic growth has been faster in North Africa than in sub-Saharan Africa and was close to 4 per cent in the 10 years to 2005 (ECA, 2006a). Nevertheless, in 2001 between 2 per cent and 7 per cent of the populations of Algeria, Egypt, Morocco and Tunisia were still suffering from hunger. The agenda for poverty and hunger reduction in these countries calls for actions to address the remaining poverty pockets, many of which are in rural areas (ECA, 2006a). Economic growth and rural development have been the slowest in Eastern and Southern Africa. Of the 350 million people in the subregion, about 260 million live in rural areas, which account for 83 per cent of extreme poverty. It is in this subregion that

hunger is the most pronounced, and hunger and poverty is combined with by far the highest HIV rates in the world. Of the 125 million poor people in Western and Central Africa, around three quarters live in rural areas.

### **The special role of agricultural growth in reducing poverty and hunger**

In terms of poverty reduction, what counts is not only how much growth occurs, but whether or not it is based on rapid agricultural growth. Most of the 2.1 billion people in the world who live on less than two dollars a day are found in rural areas and depend on agriculture for their livelihood. The number of rural poor has increased in Africa and South Asia while it has decreased in East Asia and the Pacific. The *World Development Report 2008* summarizes an extremely large body of literature that demonstrates how effective agricultural growth is in reducing poverty. Over the past 10 years, global poverty, as measured by a two dollar a day poverty line, declined by 8.7 per cent in absolute terms. This decline was entirely attributable to the reduction made in rural poverty, with agriculture as the main source of growth. At the same time, urban poverty has increased. Migration is not the main instrument for rural (or overall) poverty reduction. Improvements in rural conditions are the main means of achieving reductions in poverty.

As Johnston and Mellor (1961) showed nearly 50 years ago, agricultural growth reduces rural poverty because:

- (i) it raises agricultural profits and labour income;
- (ii) it raises rural non-farm profits, employment and labour income via linkage effects;
- (iii) it leads to lower prices for (non-tradable) foods, which is especially beneficial for the poor;
- (iv) lower food prices raise real urban wages and accelerate urban growth; and
- (v) a tightening of urban and rural labour markets raises unskilled wages in the wider economy.

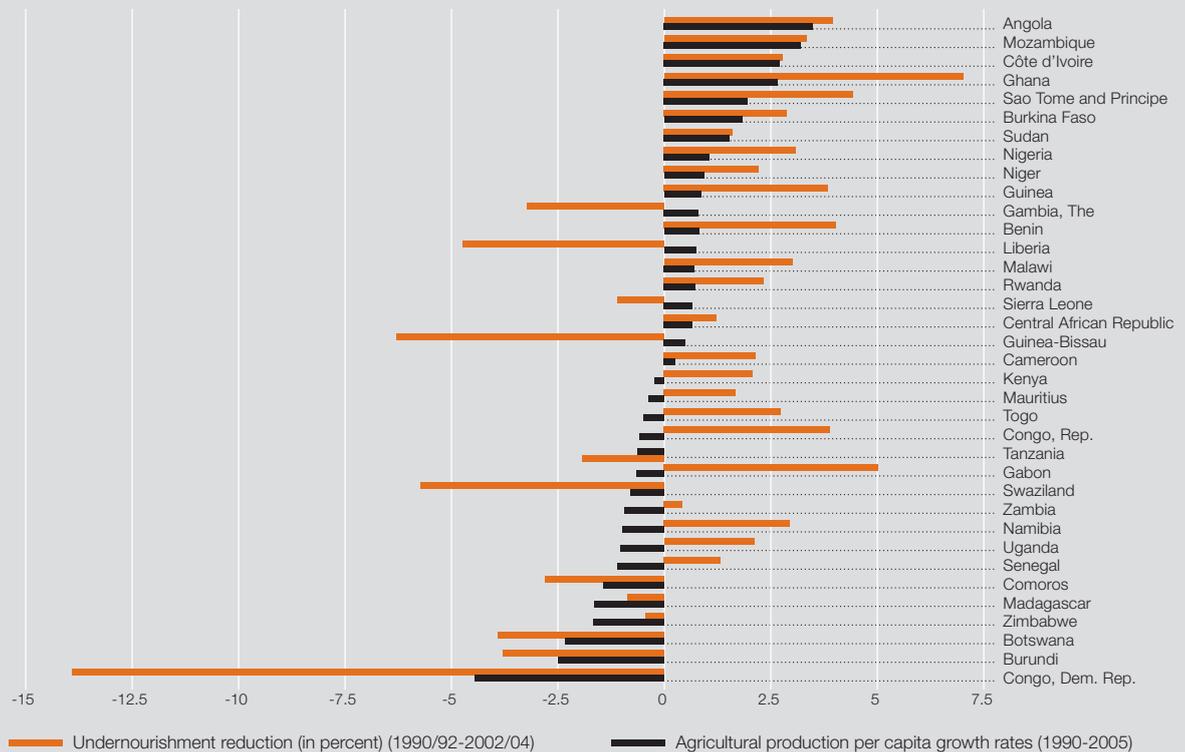
The *World Development Report* divides developing countries into “urbanizing countries”, most of which are in Latin America (but including South Africa as well), with 255 million people; “transforming countries”, which are mainly in the East Asia and Middle East and North Africa regions and account for about 2.2 billion rural people; and “agricultural countries”, which are mostly found in sub-Saharan Africa and represent approximately 417 million rural people. The latter countries are the ones in which agriculture can contribute the most to poverty reduction, but they are also the ones in which this sector has lagged behind the most and confronts the biggest barriers to growth.

Agricultural growth has a much more direct impact on hunger than general economic growth does. Figure 1 shows that, by and large, the countries with faster agricultural growth have made more progress against hunger. While hunger has declined significantly in West Africa, it has increased significantly in countries experiencing conflicts or coups d'état, such as Liberia, Sierra Leone, the Comoros, Burundi, Guinea-Bissau and, most dramatically, the Democratic Republic of the Congo. Other countries that have seen sizeable increases in hunger are The Gambia and, surprisingly, Botswana.

To sum up: A past failure to grow and the neglect of agriculture have sharply increased poverty and hunger in sub-Saharan Africa, whereas growth has contributed to poverty reduction in North Africa. Recent economic expansion in the latter region has reduced poverty, and the growth of the agricultural sector which has been associated with this expansion has been a powerful factor in reducing hunger. It is therefore clear that both AfDB and IFAD should focus on growth in their future programmes and, in particular, on widely shared agricultural and rural growth.

Figure 1 Reduction in hunger and agricultural growth

#### Agriculture and Hunger



Source: Pingali et al., 2007.



## The mandates of AfDB and IFAD, and the changing international landscape of development assistance

The two institutions involved in this review are quite different. The African Development Bank (AfDB) is a regional multi-sectoral lending institution, whereas the International Fund for Agricultural Development (IFAD) is a highly focused global institution targeting poor agricultural producers. The African Development Bank's "...primary objective is to promote sustainable economic growth to reduce poverty in Africa" (AfDB, 2006a). Total AfDB group loan and grant approvals have increased steadily over the past decade from under US\$2 billion annually to more than US\$3 billion in 2006.

Agricultural operations made up a high of 32 per cent of approvals in 1985-1988 but declined to 19 per cent in 1989-1997 (AfDB, 2000). As a share of the total, they have decreased further since then, with agricultural and rural development loans and grants totalling US\$362 million and making up slightly over 10 per cent of total approvals of US\$3.472 billion in 2006 (AfDB, 2006a). The Strategic Plan for 2003- 2007 states that, within the broad focus of reducing rural poverty, the Bank will focus on the adoption of modern technology, diversification of production systems, efficient management of natural resources and improvement of productivity of farm and non-farm activities. It goes on to note that AfDB will take a leadership role in the development of rural financial services and will support Bank-wide efforts in the areas of rural infrastructure and water resources (AfDB, 2002). The most recent AfDB strategy document on the sector concludes that, while progress has been

made, the Bank's efforts have been too narrowly focused on production aspects "...with virtually no backward and forward linkages" (AfDB, 2007a). Specifically identified weaknesses are agribusiness development, limited private-sector engagement and partnerships. The new proposed sector strategy is selective and focuses on agriculture rather than on broader rural development issues. Under this strategy, Agriculture and Agro-Industry Department (OSAN) interventions, in partnership with the private sector where possible, are to be largely concentrated in the following key areas: (a) support for rural infrastructure; (b) crop production productivity growth; (c) agro-industry development; (d) livestock production; (e) natural resource management; and (f) climate change adaptation. Efforts in these areas are expected to "...contribute to the Bank's Vision of poverty reduction through increased agricultural production and productivity, efficient marketing and expanded trade in its Regional Member Countries (RMCs), thereby increasing farm incomes and the welfare of rural populations in general, and agricultural producers and enterprises in particular." (AfDB, 2007a, p. 7).

We already note here that, within the confines of the strategies articulated so far, there are important opportunities for AfDB to promote agricultural and rural development by improving rural infrastructure, the road infrastructure connecting landlocked countries to the sea and agricultural technology. It can also do so strengthening regional and subregional agricultural and rural development institutions. In later sections

we will discuss the firm international consensus – reflected in the Comprehensive Africa Agricultural Development Programme (CAADP) of the New Partnership for Africa's Development (NEPAD) – that agricultural growth will be the most powerful poverty-reduction tool for the agricultural countries of sub-Saharan Africa. A major question that the Bank will therefore have to answer in developing its future strategy will be whether or not the strategy and its planned scale will be in line with its intended focus on poverty reduction.

IFAD's annual loan and grant operations have slowly increased since 1992 from US\$300 million to over US\$500 million in 2005 and 2006. The Fund is a small and tightly focused global organization less than one-fifth the size of AfDB. A few quotes from the IFAD Strategic Framework 2007-2010 are the best way to convey its strategy: "IFAD's overarching goal is that rural women and men in developing countries are empowered to achieve higher incomes and improved food security at the household level. ...IFAD will aim to ensure that, at the national level, poor rural men and women have better and sustainable access to, and have developed the skills and organization they require to take advantage of: (a) Natural resources (land and water)...; (b) Improved agricultural technologies and effective production services...; (c) A broad range of financial services...; (d) Transparent and competitive agricultural input and produce markets...; (e) Opportunities for rural off-farm employment and enterprise development...; and (f) Local and national policy and programming processes, in which they participate effectively." "Selectivity and focus: IFAD...will not work outside rural areas. It will not target the non-poor. It is not mandated to respond directly to emergencies and provide relief. IFAD will finance social service delivery – local water supplies, health and education facilities – only in response to the defined needs of local communities, where the facilities are limited in scope and critical for the achievement

of project objectives, and where other financing sources are not available. IFAD's expertise is specific to the rural sector: it will engage in policy dialogue only in the areas of its competence, and it will not use general budget support as a means for disbursing its resources. Targeting: ...Its target group is made up of extremely poor rural people who have the capacity to take advantage of the economic opportunities offered by IFAD engagements..." All elements of IFAD's country programmes will be expected to be innovative. Yet innovation without scaling up is of little value" (IFAD, 2007a, p. 6) .

IFAD has also produced several policy papers on rural finance (2004a), sector-wide approaches (SWAps) (2006a), supervision and implementation support (2007b) and knowledge management (2007c). The Private Sector Development and Partnership Strategy contains a very wide and innovative definition of the rural private sector: "IFAD's direct target group is the rural poor, who tend to be concentrated at the smaller end of the private-sector continuum. This group is considered part of the private sector because, in essence, it comprises agro- or rural-based microentrepreneurs who make their own economic decisions regarding what to produce and how to produce it, what to buy and sell, who to buy from and sell to, how much to buy or sell, and when." (IFAD, 2007d, p. 6)

In sum, IFAD has a highly focused, selective and well-articulated vision and strategy regarding what it will and will not do. And it has translated this vision and strategy into appropriate policies in a number of areas. It is therefore exceptionally well-positioned to take advantage of the improving African and international environment on behalf of its clearly-defined client group.

We will frame our recommendation based on the following understanding of the two institutions and their mandates: AfDB, which is the larger of the two, has a broader mandate that allows it to finance or cofinance certain types of

programmes in support of poverty reduction, such as large-scale infrastructure projects and support for regional institutions, that are beyond the capacities of IFAD and that have benefits for both poor and non-poor population groups. As a regional institution, it also has a voice and influence at the continental level that it can leverage in partnership with other regional institutions such as the African Union and NEPAD and with subregional organizations. IFAD focuses on empowering poor agricultural producers in all aspects of their agricultural and related development activities and organizations. Within this highly selective focus, it has many opportunities to innovate and collaborate with others to scale up successful innovations.

### **The changing international and institutional landscape for agricultural and rural development: 1980-2007**

#### **The 1970s and 1980s**

Despite the path-breaking academic study by Johnston and Mellor (1961), which argued that agriculture had a very positive role to play in the early stages of economic development, since the 1950s the sector has been seen primarily as a source of resources for industrial development rather than as a positive engine of growth and poverty reduction. The run-up in food prices of the mid-1970s, coupled with the realization that poverty was a predominantly rural phenomenon, resulted in agriculture and rural development being placed high up on the agenda in the 1970s. Rural development was approached via massive integrated rural development projects and free-standing agricultural credit projects that created and supported specialized agricultural credit institutions which proved to be unsustainable in the long run and which rarely reached small farmers (World Bank, 1996). Large-scale projects built a great deal

of irrigation infrastructure but paid little attention to user-driven institutions or to environmental and social sustainability (World Bank, 1995). Free-standing research projects were fairly successful in building or strengthening agricultural research. In the early 1980s, rural development represented the largest sector of lending for the World Bank. As will be seen below, other development agencies followed the same courses of action.

Early thinkers about rural development in South Asia, as well as the World Bank's 1974 rural development strategy, favoured a participatory, decentralized approach to assistance for rural groups. This approach was based on improved technology, investment in irrigation, and cooperative institutions for input supply and marketing. However, in practice, large rural development programmes and integrated rural development projects quickly lost their way. Participation was reduced to consultation, and even this was often poorly carried out. Rather than strengthening local governments and communities, these programmes delegated implementation to centralized line agencies that had difficulty reaching the rural poor (Binswanger and Aiyar, 2003). Programmes were often executed without good technologies on the shelf, and project-specific technology components were unable to bridge the gap. Coordinating the line agencies responsible for project execution proved extremely difficult. A large volume of credit was provided under these programmes by agricultural development banks, but most of the credit subsidies went to better-off producers. These programmes were more successful in the delivery of infrastructure, but the sustainability of the infrastructure remained a problem, and a few years after the projects were ended, no institutional traces of their work could be found. The failure of these large-scale rural development interventions in the 1970s and the 1980s was not rooted only in the poor design elements discussed above. It was also a consequence of the adverse

macroeconomic and agricultural policy environment facing agricultural producers and investors. This topic will be discussed in greater depth in section 4. New approaches to the local institutional framework and the support of rural development are explored in section 6.

In the early 1980s, the paradigms of development were changing. By that time the world trading system had reduced barriers to industrial trade substantially. In 1994, the General Agreement on Tariffs and Trade (GATT) brought agricultural trade under the general rules of the newly formed World Trade Organization (WTO), but this had little impact on the effective level of protection. Some nations in East Asia abandoned the inward-looking import substitution industrialization (ISI) model and succeeded in growing rapidly by expanding exports. Thus export-led growth became a new competing paradigm for general economic development.

The early 1980s were also characterized by rapid inflation and slow growth, the fallout of the run-up in oil and commodity prices in the 1970s. Project lending as a poverty-reduction tool was often not sustainable, in part because when borrowers took on additional commitments, matters frequently became worse. Consequently, poverty lending gave way to structural and sector adjustment lending in the 1980s and then to policy lending in the 1990s. In addition to macroeconomic stabilization, structural adjustment programmes focused on introducing price and trade reforms and on getting the State out of direct production and distribution activities. Privatization of loss-making parastatal enterprises served both of these objectives. Fiscal stringency also reduced the availability of funding for health, education and other social as well as smallholder services. It was assumed that the private sector would quickly step into areas within the agricultural sector that had been vacated by parastatal marketing agencies, but this expectation proved to be far too optimistic. The

macroeconomic adjustment programmes put in place market-determined exchange and interest rates, while structural adjustment programmes sought to bring down industrial tariffs, and agricultural-sector adjustment programmes focused on reducing or eliminating the taxation of agricultural exports. As we shall see in section 4, these three measures combined to improve incentives for agricultural producers and gradually revive economic and agricultural growth. However, it often took a long time for these stabilization and adjustment measures to take hold and have an impact. And few of the programmes were accompanied by adequate safety nets.

### **The early 2000s**

The international and institutional landscape of the early 2000s was radically different from what it was in the 1980s. The Cold War was over, replacing a nuclear stand-off with increasing numbers of national and subnational conflicts. This changed the rationale for international assistance and focused even more attention on the short run, which made it more difficult to fund long-term investments such as agricultural research, in general, and the Consultative Group on International Agricultural Research (CGIAR), in particular. The end of the Cold War also eased competitive pressures to expand aid, and support levels fell. Severe food emergencies and situations that created large numbers of refugees occurred with increasing frequency, placing demands on many traditional agencies for post-emergency assistance. Middle East conflicts continued to play a part in driving up petroleum prices. The Millennium Declaration identified eight Millennium Development Goals, several of which (especially the first Goal, which relates to poverty and hunger), redirected attention to rural development and to Africa, in particular. A growing awareness of the importance of the environment and of social sectors, especially health, triggered a radical shift in the lending and

assistance portfolios of international financial institutions and bilateral agencies. HIV/AIDS emerged as a high-priority health, labour and poverty issue. The World Bank and other development agencies began to champion good governance and declared war on corruption. The Doha Development Round focused (so far unsuccessfully) on types of trade liberalization that would be of particular benefit to developing countries. The world's attention was diverted away from agriculture and rural development, even though rural poverty and the undernourishment of 800 million people persisted. Thus, the beginning of the new millennium was marked by great uncertainty, escalating conflicts and increased competition for funds. The level of funding for agriculture and rural development hit a 25-year low in 2001. Recently, however, the rhetorical interest in agriculture seems to be on the rise. The CAADP programme of NEPAD, the InterAcademy Council report (2005), the "Blair" report of the Economic Commission for Africa (ECA) (2005) and the World Bank's *World Development Report 2008* all make forceful cases for the major role that agriculture has played in poverty reduction in Asia and for its potential for playing the same kind of role in Africa.

The emerging development paradigm revolved around an open economy and around market-driven, private-sector-led economic development. The role of government was to set appropriate rules, provide necessary public goods and make sure the playing field was level, fair and open. Agricultural development paradigms continued to change as well. Some countries had achieved rapid growth by allowing agricultural exports to lead the way. The long-standing, but artificial, distinction between food crops and market/export crops disappeared. Agricultural growth stimulated rural non-farm activities in many countries, driving up employment and income levels.

Thus, the 1961 Johnston-Mellor thesis finally seemed to be back in vogue. It was recognized that,

in most countries, agriculture was the largest private-sector activity and that farmers would respond to incentives. Privatization, the end of central planning and the rise of the market refocused attention on the factors that contributed the most to rural growth. For African farmers, most of whom operate on a small scale, these factors were productivity- and profitability-boosting technology; access to necessary inputs; and fair and open markets at home and abroad. Trade liberalization therefore became part of the rural development policy mix. For the rural sector, these factors encompassed education, infrastructure (especially transport) and properly functioning markets.

Accepted processes of development – the "hows" – continued to be challenged and added to. The emergence of a burgeoning number of highly varied community-based organizations and Non Governmental Organizations (NGOs) at the local, national and international levels radically altered our perceptions of which were players and what needed to be done. Many agencies became involved in the implementation of emergency and other activities, and many have subsequently developed sufficient capacity to act as technical partners, especially in the rural, natural resources and food sectors. The concept of democratization in project design and implementation necessarily entailed the participation of potential beneficiaries. This, and the adoption of the concept of subsidiarity (i.e., the idea that decisions should be decentralized to the lowest – often community – levels possible), led to the concept of client ownership, which is a far cry from the top-down, complicated, complex, expatriate-dominated integrated rural development projects of the past.

### **Donor fragmentation and behaviour**

The number of players who claim a legitimate role has soared. As noted by Homi Kharas: "Estimates suggest that there are 233 multilateral

development agencies; 51 bilateral donor countries (most with multiple official agencies); several hundred international NGOs; and tens of thousands of national NGOs, not including community-based organizations which could number in the millions". (Kharas, 2007, p. 3) This author classifies the new players into two groups:

- (i) New bilateral donors from the South, including large donors such as China (US\$2 billion per annum), India and Saudi Arabia (over US\$1 billion each), several more in the US\$500 million range (Republic of Korea, Turkey, Kuwait and Taiwan Province of China) and a total of 21 more which have or are establishing aid programmes. "Estimates of aid from new players equalled or exceeded official development aid from traditional donors in 2005" (ibid., p. 6).
- (ii) Private organizations, including international NGOs such as World Vision International, with a budget exceeding US\$2 billion, another four with budgets of between US\$500 million and US\$900 million (Save the Children International, Care USA, Catholic Relief Services and Plan International) and thousands of philanthropic foundations that contribute to international causes. The largest of the latter in 2004 were the Bill & Melinda Gates Foundation, at US\$1.2 billion, and the Ford Foundation, at over US\$250 million.

New bilateral aid players such as China, India and Brazil are also now major commercial development players in terms of markets, inputs, technology and finance. BBC News estimates that the most recent wave of Chinese migrants to Africa is "... thought to total up to 750,000" and has stated that "They are settling all over the continent, in rural and urban areas, are involved in agriculture, construction and trade" (BBC News 2007/11/29).

Within the United Nations system, agencies such as the World Health Organization (WHO), the United Nations Children's Fund, the Joint United Nations Programme on HIV/AIDS (UNAIDS), the Food Insecurity and Vulnerability Information and Mapping System and others became increasingly engaged in issues of nutrition and health. Millennium Development Goal task forces, particularly Task Force One, are new players. New conventions on such subjects as desertification and the Montreal Protocol on Substances that Deplete the Ozone Layer have overlaps with the Food and Agriculture Organization of the United Nations (FAO), and the work of the World Food Programme and IFAD is now more closely entwined in the areas of emergency response, early warning and a renewed focus on Africa. African nations working through the African Union have identified joint action as critical and created the NEPAD, together with its CAADP programme for agriculture, along with many other institutions concerned with regional integration and specialized development tasks.

Kharas shows that once all the items that are not really targeted at promoting development are factored out, aid for development from traditional donors in rich countries has hardly grown at all: "Of the US\$100+ billion of official development assistance disbursed by rich countries to developing countries in 2005 only US\$38 billion was oriented towards long-term development projects and programs. Of this US\$38 billion, perhaps half reached the intended beneficiaries. The balance of the money is tied up in special purpose funds like debt relief and technical assistance, or in administrative costs incurred in both the donor and recipient country. Presumably some is lost to corruption, too... Traditional donors are splintering into many specialized agencies." His analysis regarding Africa is particularly sobering: "This same story is replayed on the ground in Africa. The rhetoric is

one of progress: the G8 has an Africa Action Plan, with special representatives to keep a focus on the poorest continent. But so far, Sub-Saharan Africa has hardly seen any funding increase at all. Astonishingly, our estimates suggest that only US\$12.1 billion of the overall official development assistance takes the form of funds that SSA countries can use to invest in social and infrastructure development programs – one cent for every US\$27 in rich country income.” (Kharas, 2007, pp. 1 and 6).

Easterly, based on a statistical analysis of data compiled by the Development Assistance Committee of the Organisation for Economic Co-operation and Development (OECD), comes to even more pessimistic conclusions: “The record of the aid agencies over time seems to indicate weak evidence of progress due to learning or changes in political support for poverty alleviation. The positive results are an increased sensitivity to per capita income of the recipient (although it happened long ago in the 1970s), a decline in aid tying, and a decrease in food aid as a share of total aid. Most of the other evidence – increasing donor fragmentation, unchanged emphasis on technical assistance, little or no sign of increased selectivity with respect to policies and institutions, the adjustment lending-debt relief imbroglio – suggests an unchanged status quo, lack of response to new knowledge, and repetition of past mistakes”. (Easterly, 2007, p. 38).

Collier (2007) comes to somewhat more positive conclusions. He has estimated that aid has, on average, added one per cent to the growth rate of the bottom billion countries, which in some cases has prevented the rate from becoming negative. Aid has been more successful than oil revenues in improving growth. It also reduces capital flight because it makes private investment more attractive and therefore helps to keep money in the country. Nevertheless, because of the fungibility of money, aid inadvertently helps finance about 40 per cent of African military

expenditures. Unsurprisingly, it has been more successful where governance and policies are better. The allocation of aid is not poverty efficient, however, since far too much of it goes to middle-income countries.

Of course, these discouraging trends have not gone unnoticed. Calls for greater harmonization and alignment of the operational policies, procedures and practices of development institutions were set forth in the Rome Declaration on Harmonization of February 2003. In March 2005, this was followed by the Paris Declaration, to which over 100 ministers, heads of agencies and other senior officials committed. But progress on the ground has been slow.

Official development assistance for agricultural and rural development in Africa in constant 2005 dollars rose from a little over US\$1 billion in the early 1970s to over US\$3 billion in the early 1990s, and then spiked to around US\$5 billion in 1986 and 1987. After falling back to around US\$2 billion in the 1990s, it has fluctuated between US\$1.5 billion and US\$1.8 billion since then. A much larger share of the total has gone to agriculture than to rural development, whose share has been relatively stable at around US\$500 million since the early 1990s. Over the period 1974-2005, bilateral aid totalled just over US\$40 billion, while multilateral aid totalled US\$37.7 billion. The largest bilateral donor over the period was the United States of America. Aid commitments of individual bilateral and multilateral donors varied considerably over the period, in particular in the cases of the United States and the European Union. IFAD and AfDB have had a fairly stable pattern of commitments of between US\$100 million and US\$300 million, except for two peaks in the AfDB in the 1980s. Overall, however, the commitments made to these organizations have been much less volatile than those of many bilateral donors and certainly more stable than commitment levels of the European Community and the United States.



**M**ajor forces continue to buffet the global agricultural/food/natural-resource complex and will continue to do so for the foreseeable future. Some of these forces have been in place for enough time to permit initial conclusions to be drawn about their impact. Others are in very early stages of their development, and projections about their influence would therefore be of dubious validity. The private sector will perform an even larger role in the future, as it is a major player in connection with most of the issues/challenges listed below. The current spike in food prices poses significant short-run policy challenges. After this upsurge and after prices settle back to what are nonetheless expected to be higher levels than before the spike, major opportunities will open up for African agriculture. Some experts have characterized these shifts as irreversible structural changes. We will discuss five of them:

- (i) Globalization, trade liberalization, international private-sector consolidation and the changing role of the private sector.
- (ii) Biotechnology and the privatization of agricultural research.
- (iii) Climate change and other transboundary issues.
- (iv) Biofuels as a permanent or transitory global demand factor.
- (v) Sharp price rises and the food crisis.

## Globalization

The first wave of globalization started in the sixteenth century with the transatlantic silver, sugar and cotton trade. It brought major new staple crops to Africa, such as maize, potatoes, sweet potatoes, cassava, and fruits and vegetables, including the ubiquitous tomato. The transport revolution associated with the introduction of steamships and railroads in the second half of the nineteenth century brought all of Africa into the international division of labour. After the interruptions of the First World War, the Great Depression and the Second World War, globalization gathered renewed momentum in the second half of the twentieth century, although it was still held back to some extent by restrictive trade policies that have since been relaxed. The negative impacts of these successive waves of globalization included slavery, migrant labour systems, disease, colonialism, unfair trade and taxation, war, and the destruction of indigenous social systems and cultures. On the positive side, they brought new modes of transport, goods, services, technologies and institutions to Africa that are too numerous to list. While there were many losers, there were innumerable winners as well.

How negative or positive will the current wave of globalization be for Africa, and who will stand to lose or gain? Given the presence of stronger State and regional institutions, this is not simply a question of what globalization will do to Africa, but also of how countries and institutions (which are not nearly as helpless now as they were in

some cases in the past) will seize its opportunities and shape its impact. Over the past two decades, many African countries have clearly been benefiting from globalization thanks to increased mineral exports, cheaper consumer goods, lower food prices, agricultural market opportunities and associated technologies, although the impacts have varied across Northern Africa and sub-Saharan Africa. There has been a considerable transfer of global technologies relating to poultry farming and other stock-raising activities, but there have been fewer transfers in the case of crop technology.

While globalization does open up new opportunities in agriculture, it also has a negative side in the form of very stiff international competition in food grains, meats, horticulture and processed products. For some African fresh fruits, vegetables and horticultural products, competition from other developing countries has become fiercer. The action agenda discussed in section 7 offers options for seizing opportunities and dealing with challenges. In order to assist countries to cope with increasing competition, IFAD and AfDB need to adopt an approach focused squarely on the market; AfDB could develop a niche in helping regional organizations and member countries to deal with sanitary and phytosanitary rules, standard-setting and quality assurance capabilities using its subregional and country-specific instruments.

### **Trade liberalization**

Trade has grown very rapidly over the past 50 years and now makes up a much larger share of world economic activity than before. Agricultural trade will come to represent an even larger share as a consequence of increased South-South trade. Nevertheless, constraints on trade in agriculture are the last bastion of protectionism in the real trade sector. As we will note again in section 7, African farmers clearly need more access to international, regional and subregional markets.

African governments and institutions need to watch carefully how the Doha Round turns out. Since so far it has failed, it is likely that the major trading nations will seek to gain access to closed markets and to attack “unfair” barriers to trade by means of trade litigation and the WTO dispute settlement mechanism. This will place small African nations at a further disadvantage, as the process is expensive in terms of both money and intellectual capital. Another likely consequence of failure would be a further acceleration of bilateral and multilateral preferential trading agreements. There are already too many regional trade agreements in Africa, and a further movement towards bilateralism in Africa would clearly be counterproductive.

We see little opportunity for AfDB to add value to the analytical work or the global trade negotiations. However, AfDB could play a major role as a champion of freer trade and better access for its regional member countries and, via its grant window, could work to build capacity for implementation of any agreements that are reached or for dealing with the consequences of a failure of the Doha Round.

The African Union and NEPAD have recognized the need to streamline the regional trade architecture. Fortunately, AfDB appears to be giving high priority to support for regional integration.

### **International private-sector consolidation and the changing role of the private sector**

The smallholder farmer in Africa and Asia is at the centre of the food security and poverty challenge of the twenty-first century. In order for such farmers to succeed, they must interact with a broad set of interfaces and markets. Seeds and breeding stock are increasingly supplied by the private sector and, ultimately, by multinationals; inputs (fertilizers, chemicals, machinery and feed supplements) are supplied by the private sector as well and primary products, too, are mainly traded

by the private sector, including very large multinationals such as ADM, Bunge, Cargill, ConAgra and Louis Dreyfus. Once primary products are assembled in bulking centres, they then need to be processed, stored and transported (again, in all probability by major multinational firms such as ADM, Cargill, Coca Cola, ConAgra, Nestlé, PepsiCo, Tyson and Unilever, etc.). Ultimately, the food is sold in retail shops to consumers, and it is at this stage that perhaps the most active “supermarket revolution” is just now unfolding. The bottom line is that private agrifood multinationals are driving changes in the global food economy more than ever before.

Overall, this process entails an increasing international consolidation of firms combined with their vertical and horizontal integration. The seed industry, genetic improvements and related technology are dominated by six multinational firms. Many of these same firms are involved in providing agricultural pest control. Supplies of fuels, fertilizers and other chemicals also come from industries characterized by significant economies of scale and exhibit a similar degree of concentration worldwide. On the marketing side, major firms such as ADM, Bunge, Cargill, ConAgra, the Conti Group and Louis Dreyfus, which are generally identified as primary (grains, oilseeds) product handlers, are also engaged in seeds, feeds, fertilizers, food processing, sweeteners, biofuels and, in a few cases, wholesale food distribution. Firms primarily identified with food processing, such as Heinz, Kraft Foods-Philip Morris, Nestlé, PepsiCo, Sara Lee, Tyson and Unilever are also integrating forward into distribution and backward into primary product handling. Of course, firms such as ADM and Cargill are also important in the processing sector.

These trends have been present for some time in the OECD countries. What is new is that these same firms are now establishing an important presence in the rest of the developing world. In

part, this is being driven by what is called the “supermarket revolution,” which is bringing about radical changes in national, regional and global food supply chains. “Supermarkets have spread extremely rapidly in developing countries after the ‘take-off’ in the early to mid-1990s” (Reardon, Henson and Berdegué, 2007, p. 1). In sub-Saharan Africa, the supermarket revolution started in the mid-1990s. As of 2003, 55 per cent of retail food sales in South Africa were made by supermarkets. The market was dominated by four firms, and these same firms have since spread to smaller cities and other countries. For example, Shoprite, the largest South African firm, operated over 400 supermarkets in 14 countries in 2003. (In 1979 it had eight stores in South Africa.) (Weatherspoon and Reardon, 2003). In their analysis, these authors were particularly concerned about the implications for small local farmers: (i) “Where medium-large growers are available in the country in which a chain is operating, the retailer draws as much as possible on these growers who are usually formed into associations that both export and sell to local supermarkets... (ii) Where the larger growers are not available, and where small farmers cannot yet meet the standards of the supermarkets, there is some reliance on importing produce to the stores in a given country from South Africa or other countries where the needs can be met... (iii) Where projects can be put in place to ‘upgrade’ the small farmers to meet the needs of supermarkets, the chains appear to be eager to participate in these schemes.” (ibid., p. 14). Similar developments have been observed in Kenya since 2000, when two leading indigenous firms first became dominant in retail sales in Nairobi and then expanded into other towns in the country.

Who benefits from this revolution? Neven, Reardon et al. studied the socioeconomic status of Nairobi supermarket customers and found “... that contrary to the conventional image of

supermarkets in developing regions – the place for the rich to shop – purchasing from supermarkets has penetrated the food markets of the poor and low income groups – in Kenya, already 56 per cent of supermarket clientele... [and] 60 per cent of Nairobi's poor buy some of their food in supermarkets each month." (Neven, Reardon et al., 2006, p. 119). With respect to farmers, Neven, Odera et al. present a clear-cut finding: "We analysed the farm-level impact of supermarket growth in Kenya's horticulture sector... The analysis revealed a threshold capital vector for entrance in the supermarket channel, which hinders small, rainfed farms. Most of the growers participating as direct suppliers to that channel are a new group of medium sized, fast-growing commercial farms managed by well educated farmers and focused on the domestic supermarket market. Their heavy reliance on hired workers benefits small farmers via the labour market. (Neven, Odera et al. 2007, p. 1).

Unlike what has occurred in other parts of the world, so far non-African multinationals have not penetrated the African market. Thus, to date there is little evidence of any displacement of domestic supply chains. In many small countries, it may not pay outside firms to invest in local wholesale and processing facilities, so they may choose to source outside instead. The critical question for Africa is: To what extent are supermarket chains sourcing locally? In order to compete, African supply chains – from farmers to wholesalers – need to adapt. An important role could be played by farmer organizations, especially regional and subregional associations that could form regional cooperatives or joint venture companies. The evidence seems to suggest that African firms prefer to source locally, especially in the case of fresh produce, so these developments offer opportunities as well as posing some threats.

AfDB should devote attention to institutions, policies and investments along the entire supply chain, i.e., to a private-sector interface. IFAD can

assist small farmers in reaching the required threshold of capital and skills and can help them to link up to supply chains. This will also involve strengthening their organizations.

### **Biotechnology and the privatization of agricultural research**

Farmers have been genetically modifying plants and animals for 5,000 years or more, and agricultural scientists have joined them in this activity ever since the Mendelian revolution in the nineteenth century. The only controversial issue is whether or not it is appropriate to transfer genes from one species to another. Evenson and Raney (2007) address these political and scientific issues. Among the developing countries, China and Brazil, followed by India, have invested heavily in agricultural biotechnology. On the other hand, the CGIAR system is spending less than 10 per cent of its overall budget on biotechnology research, perhaps because of the resistance put up by important European donors. The huge success of Bt (*Bacillus thuringiensis*) cotton and the prospects of nutritionally fortified rice and other crops have taken some of the wind out of environmental critics' sails. Bt cotton has resulted in dramatic reductions in pesticide use, as well as providing higher yields and incomes for small farmers without having any adverse environmental consequences.

The potential offered by our rapidly expanding knowledge of genomics and our increased capacity to modify useful plants and animals can become an important factor in adaptation to and mitigation of climate change, desertification, increasing resource scarcity, and threats from pests and diseases. Possibilities for building in stress (drought, heat and cold) resistance, immunity to pests and diseases, and improved nutritional values, as well as for "manufacturing"

pharmaceuticals in living plants, were wild dreams 20 years ago but are now much closer to reality. For example, Monsanto and BASF have just announced a US\$1.5 billion biotechnology research and development partnership in which the “Focus of efforts will be on the development of higher yielding crops that are more tolerant to adverse environmental conditions such as drought.” (CropBiotech Update, 23 March 2007).

But will all this occur fast enough to offset continued population and income growth and mounting stresses on natural resources? The answers will come mainly from private-sector proprietary research that enjoys intellectual property protection. The fundamental question is how the benefits of biotechnology can accrue to small African farmers in a world of privatized research. In addition, however, there are a number of major public goods issues that remain to be addressed. We will list three of those issues here:

**(i) Conservation of global genetic resources**

In the case of the 64 plant varieties covered by the International Treaty on Plant Genetic Resources for Food and Agriculture, significant progress has been made in terms of preservation, conservation, access, ownership and returns from genetic modification; but what about the rest of the plant kingdom (including forest species), animals, fish and critical microbial life? Who is helping African countries deal with the issues raised by differences or apparent inconsistencies between trade-related aspects of intellectual property rights (TRIPS)/WTO, the Convention on Biological Diversity, and the International Treaty on Plant Genetic Resources for Food and Agriculture as they relate to the large number of non-traditional, infrequently traded crops grown in Africa?

**(ii) Biosafety protocols**

The huge volume of rules and regulations concerning the development and testing of genetically modified organisms are in a state of flux. Competing and conflicting North American and European paradigms place small developing countries at the mercy of large trading blocs when they attempt to decide whether they want to develop, import or consume genetically modified organisms. What is FAO doing to help countries develop the necessary rules and procedures? What role could IFAD or AfDB play in this regard?

**(iii) Access to promising genetic materials and techniques**

Research in the field of molecular biology is expensive. Six multinational firms dominate molecular genetic research on plants and animals: BASF, Bayer, Dow AgroSciences, Dupont, Monsanto and Syngenta. The challenge is to find ways in which these firms can share promising technologies with developing countries without compromising their legitimate right to garner profits from their investments in discovery. The Donald Danforth Plant Science Center and the African Agricultural Technology Foundation (AATF) are possible models. Clearly, regional research organizations must acquire the capacity to participate as peers as the molecular biology revolution plays out.

Even where gene technology is donated, progress may be slow progress, despite the fact that at least three biotech initiatives in Africa are being pursued by NEPAD, AATF and the Alliance for a Green Revolution in Africa. Carl Eicher et al. (2006) reviewed biotechnology development for

six food crops and cotton in Africa and found unexpected scientific, legal, economic and political barriers to the development of genetically modified crops, together with long delays in developing and implementing national biosafety regulations and guidelines. These authors concluded that, unfortunately, with the exception of Bt cotton, most genetically modified crops are at least 10-15 years from reaching smallholders in Africa. Can Africa afford to be left behind by China, India, and Latin America? Should it adhere to complex regulations dictated by others?

Whatever the answers to the above questions prove to be, biotechnology approaches must be nested and integrated into plant breeding programmes. Special attention should be given to raising public awareness of and political support for biotechnology, and a commitment should be made to strengthening African capacity in biotechnology, biosafety, food safety and intellectual property rights, along with training the next generation of African plant breeders and genetically-modified crop specialists.

Because of its greater political independence (even though it receives a significant amount of financing from European sources), AfDB has a first-class opportunity to invest in all aspects of biotechnology and could seek a partnership with China, India and Brazil. It could invest in regional centres of excellence for research and teaching, laboratories, national and subregional capacity for regulation, etc. The role of IFAD would be to disseminate technology packages and assist with the distribution of finished outputs.

### **Climate change and other transboundary issues**

Africa has experienced major climatic changes since mankind emerged on the continent approximately 150,000 years ago. Ever since the

onset of agriculture about 8,000 years ago, climates have changed periodically. The most compelling evidence of this is provided by the available records on two periods of pastoralism in virtually the entire Sahara desert that lasted until about 4,500 years ago (Reader, 1998). African agriculture's capacity to adapt to these massive changes in the past is well documented.

The vast majority of experts now agree that global warming is caused by human activity. The basic question now is whether or not the process can be slowed, stopped or even reversed. This is the issue of mitigation. The second issue is adaptation, i.e., what the world can do to adjust to the outcome of climate change. Lomborg, in his recent book, *Cool It: The Skeptical Environmentalist's Guide to Global Warming* (2007), makes the case that we should conduct a serious cost-benefit analysis in order to compare the benefits of spending a great deal of money on minimal reductions in carbon dioxide with the benefits of spending the same or less money on pressing current development issues, on adaptation and on research regarding lower-carbon technologies. Sub-Saharan Africa is the region that contributes the least to global warming. It has the most urgent economic and social problems. The case for putting less emphasis on mitigation in sub-Saharan Africa (except for land-use changes) and more on dealing with pressing current needs and on future adaptation is stronger here than anywhere else. The situation is somewhat different in North Africa, however, where the case for mitigation is stronger.

A growing number of modelling efforts suggest that the temperature impacts will be greater in the higher latitudes and that night temperatures are likely to increase more than day temperatures. Precipitation may increase in higher latitudes but will be reduced in areas such as the Mediterranean and Southern Africa. Adverse agricultural consequences are likely to be negative in the lower

latitudes, where temperatures are already high and precipitation is already limited, and they may be positive in the latitudes closer to the poles (Cline, 2007). For Africa, the impacts are expected to be considerably more adverse than for the developed world but less alarming than, for example, the projections for India and Mexico. There is also a growing view that the frequency and amplitude of extreme weather events may be increasing. All of these phenomena will negatively affect farmers and increase their risks, and this is especially true in the case of small farmers running rainfed agricultural operations.

Global warming will bring changes in crops, cropping patterns, timing, agronomic practices and seed requirements. It reinforces the need for stronger research systems capable of improving the resistance of crops and animals to biotic stresses and for investments in irrigation and water management. Farmers will be better able to adapt if agriculture is highly profitable and if they have the required savings to invest.

African agriculture can take advantage of various opportunities, as noted in such papers as: "Climate mitigation through carbon offsets and carbon trading can increase income in rural areas in developing countries, directly improving livelihoods while enhancing adaptive capacity" (Yohe et al., 2007, p. 1) and "Land use change (18.2 per cent) and agriculture (13.5 per cent) together create nearly one-third of greenhouse gas emissions...this represents potential financial flows of US\$130-260 billion annually, comparable to official development assistance of US\$100 billion, and foreign direct investment in developing countries of US\$150 billion" (ibid., p. 3).

Adaptation to climate change and the risks it brings should be part of overall development and coping strategies. Yohe et al. conclude that "(the) tendency has been to treat adaptation to climate change as a stand-alone activity, but it should be integrated into development projects, plans, policies, and strategies" (ibid., p. 2). Howden et

al. (2007) make a similar argument: "We argue that achieving increased adaptation action will necessitate integration of climate change-related issues with other risk factors, such as climate variability and market risk, and with other policy domains, such as sustainable development." The lessons for AfDB and IFAD are that responses to the challenge of climate change need to be integral parts of their individual and collective agricultural strategies and programmes.

For AfDB, the main opportunities arising in connection with climate change are in assisting national, subregional and regional institutions to develop the capacity they need to take advantage of future carbon trading opportunities. The emphasis that both AfDB and IFAD place on irrigation will also be well suited to these purposes. IFAD already hosts the secretariat for the Global Mechanism as a way of helping to raise resources to combat desertification. In addition, it should mainstream adaptation to climate change into its programmes, including activities focusing on harnessing local opportunities for carbon trading, as and when they come on stream.

Infectious animal and plant diseases have ravaged Africa from time immemorial. Reader (1996) describes a rinderpest epidemic around the turn of the nineteenth century that may have killed off 90 per cent of Africa's livestock herds, led to catastrophic population losses, and triggered an economic, social and cultural decline that paved the way for the exceptionally easy conquest of Africa by European colonizers. Samuel C. Jutzi (2007) states that "The impacts of infectious diseases and their control on the agricultural sector, on national economies, on rural development, on livelihoods, on regional and international trade, on food security, on agricultural biodiversity and on human health are actually and potentially massive. ...it has been established that 70 per cent of all new infectious diseases of humans stem from animals." The

latest examples are HIV/AIDS. What is new, however, is that modern science and appropriate risk management by governments and regional organizations can sharply mitigate and, in some cases, eliminate these risks.

This is yet another area in which regional, transnational approaches are required. And again, AfDB is appropriately placed to assist in the financing of these regional and subregional efforts.

### **Biofuels: A permanent or transitory global demand factor**

The FAO price index for all foods in dollar terms has more than doubled since the last three years of the twentieth century (see figure 2). Between the beginning of 2007 and mid- 2008, rice prices have tripled, wheat prices have more than doubled and maize prices have almost doubled (Stoeckel, 2008). Prices for individual commodities such as milk, maize and oilseeds have also increased. Many experts say that a significant part of the cause is extensive subsidization or mandates for a substantial increase in ethanol production as a partial substitute for petroleum products used in producing motor vehicle fuel. In the next section we will discuss the potential impact of biofuels on food prices in the context of the overall explosion of global commodity and food prices.

The use of biological material for energy production has a long history that can be traced back to the use of firewood, charcoal, manure, biogas, agricultural wastes and by-products. This is now known as "bioenergy". Brazil has been producing ethanol from sugar cane for over 30 years now, and this source currently makes up more than 40 per cent of the country's motor vehicle fuel supply. The United States has mandated an increase in the share of its auto fuel supply that is to come from ethanol (produced

mainly from maize) from 5 per cent to 10 per cent by 2011 and seems poised to increase the percentage even further. Europe has embarked on a programme aimed at promoting the production of biodiesel from temperate oilseeds such as rape, canola and soybeans as a renewable substitute for diesel fuel.

There are a number of very serious questions as to how much net energy savings are actually realized from using corn for high-cost, energy-intensive ethanol production processes involving a large percentage of fossil fuel inputs (petrol, fertilizers, pesticides and other petroleum-based inputs). Furthermore, there are significant differences in energy yields between different feedstocks. For example one hectare of sugar cane yields 6,000 litres of ethanol, compared with a yield of 3,000 litres from corn, 2,500 from wheat and 1,000 from barley. One hectare of palm oil yields 4,500 litres of biodiesel, compared with a yield of 2,000 from jathropha, 1,100 from rapeseed and 500 from soybeans (Worldwatch Institute, 2006). At some as yet undetermined time in the future, a process using cellulosic feedstocks (grass, waste products, trees) to produce ethanol will become commercially feasible. Such a process should provide a higher product yield at a lower cost. The problem lies in breaking down the cellulose to free the carbon; at present, this can be done using enzymes but it is hard to scale up. This is, however, an engineering rather than a scientific problem.

In 2005, before the recent rise in food prices, Schmidhuber computed oil parity prices at which biofuel production would have started to become profitable. He found that the most economical production of biofuel was achieved by sugar cane producers in Brazil, with an oil parity price of US\$35 per barrel. The next most economical case was large-scale cassava-based ethanol production in Thailand, at US\$38 per barrel, followed by US\$45 per barrel for palm-oil-based biodiesel in Malaysia. At the crude oil prices that prevailed in

1995, these three feedstocks and locations were already profitable. Maize-based ethanol production in the United States was much less efficient, with an oil parity price of US\$58 per barrel. For mixed feedstocks in Europe and for the processing of biomass into liquid synfuel, the parity prices rose to US\$80 per barrel and US\$100 per barrel, respectively. Production based on those kinds of price levels would have required enormous subsidies at the time (Schmidhuber, 2006).

However, these break-even points depend on the price of the feedstock used for biofuel production. At US\$60 per barrel for crude oil, the break-even price for maize-based biofuel production is not profitable without subsidies equivalent to US\$2.01 per bushel of maize. At a crude oil price of US\$120, maize could cost more than 2.5 times as much (US\$5.20 per bushel) before the point is reached beyond which maize-based biofuels become unprofitable. In June 2008, maize was trading at above US\$7 per bushel in Chicago, which means that it was too expensive to be used for ethanol production without subsidies. Given these data, it is clear that at the crude oil price of US\$145 that prevailed as of this writing in early July 2008, maize-based biofuels would still be unprofitable without subsidies.

Steenblik (2007) provides estimates of total subsidy equivalents for biofuel production, which represent the total value of all government support to the biofuels industry (including the total value of consumption mandates, tax credits, import barriers, investment subsidies and general support to the sector in such areas as public research investment). This measurement does not include support for agricultural feedstock production. United States biofuels processors and farmers received about US\$6.7 billion in 2006. Those in the European Union received about US\$4.7 billion. In addition, most of the various types of support vary with the level of

production, which means that increases in biofuel mandates will lead to much larger OECD biofuel subsidies.

Fuel prices have always had a significant impact on food prices via their impacts on the cost of running mechanized equipment, of transportation to and from the farms, and of fertilizers, pesticides and herbicides, but increased biofuels production has created a new, much more direct link between food and energy prices. In the next section we will show that the future expansion of biofuels production will have a very large impact on projected prices, as shown by several global food projection models.

What are the other consequences or trade-offs of using agricultural output for energy rather than food? Can world agriculture do both? And at what price? These issues were discussed extensively at the High-Level Conference on World Food Security (FAO, 2008) based on the rapidly growing literature on this topic. The International Food Policy Research Institute (IFPRI) and CGIAR have produced a series of Issue Briefs on the subject as well (IFPRI, 2006). The United Nations has announced the formation of an International Biofuels Forum (CropBiotech Update, 9 March 2007) which is aimed at promoting the sustained use and production of biofuels on an international scale. The Worldwatch Institute, in partnership with the German Agency for Technical Cooperation (GTZ), published a major study entitled *Biofuels for Transportation* in June 2006.

For Africa, these developments will have multiple, often competing impacts. Returns to small farmers increase as prices rise, but so do food costs for the urban poor and the landless. But beyond these obvious impacts, there are also opportunities.

The relative efficiency of commodities in the production of biofuels, as noted above, vary greatly, with sugar and palm oil being the most efficient so far. This could open up

opportunities for certain African countries to produce for the global market without subsidies. If Africa could produce at costs similar to those borne by Brazil, Thailand and Malaysia, it could make sugar cane, cassava and palm-oil production more profitable. Production of biofuels from cellulose could hold out a huge potential for the future, especially for the many areas of medium- quality cropland that are not yet intensively farmed and for the humid tropics. In all cases, decisions to engage in the production of biofuels should not be made on a political basis, as has often been done in the developed world, but rather on the basis of a careful benefit-cost analysis. Sub-Saharan Africa cannot afford to subsidize the production of biofuels.

AfDB should invest in its capacity to analyse the entire supply chain surrounding these opportunities and, ultimately, to promote the development of these sectors as more economical technologies and opportunities become available. As these opportunities arise, IFAD should assist smallholders to participate in these supply chains, as has already been done with the funding of a pro-poor biofuels project focusing on sweet sorghum for ethanol and jathropha for biodiesel. These projects are being run by the International Crops Research Institute for the Semi-Arid Tropics (ICRISAT) (CropBiotech Update, 14 December 2007.)

## Sharp price rises and the food crisis

On 10 June 2008, *The Wall Street Journal* reported that the grain import bill of 82 low-income countries has doubled since 2006. To put the dramatic recent food price changes into perspective, we will first review the history of food price trends since the early 1960s, both in nominal and real terms, and then compare them with exchange rate movements and changes in energy prices, which have also been dramatic. We will then discuss the driving forces behind the expanding global demand for food and the emerging demand for food crops for use in the production of biofuels. Finally we will consider the question as to whether or not these price changes reflect a permanent shift in the global balance of agricultural supply and demand.

### The extent of price changes

As indicated by figure 2, most of the sharp rise in nominal international food prices has come between 2006 and 2008. It is not nominal prices that count, however, but real prices. In footnote 1, we discuss why we have chosen to use the same measurement as was recently used by FAO, i.e., the index of the unit value of exports of manufactured goods (MUV) sold by the G-5 countries to developing nations.<sup>1</sup> Using real prices reduces the shock since 1998-2000 to an increase of about 65 per cent. As may also be seen from this figure, this is a much sharper percentage increase than the food-price shock of the early 1970s, although real prices are still lower than they were in the 1970s.

1/ If we are looking at purchasing power impacts, then an index of wage rates, or a consumer price index for low-income consumers, should be used as a deflator. Such indexes are available for individual countries, and these are the price indexes that countries need to use to analyse the impacts of their food prices on consumers. And to analyse the countries' purchasing power, we should deflate by a price index of their exports. But the export mix of developing countries varies enormously depending on whether they are oil and mineral exporters or are exporters of labour-intensive manufactured goods or agricultural goods, and each country therefore needs to conduct its own analysis. An alternative is to look at the cost of manufactured imports, since countries might have to give up some manufactured imports in order to buy more food. Again, no such global price index is available. In an analysis that FAO undertook for a recent meeting on the food crisis, it therefore chose the index of unit value of exports of manufactured goods (MUV) sold by the G-5 countries to the developing world as calculated by the World Bank. One of the merits of this index is that it already reflects changes in the relative exchange rates between G-5 countries.

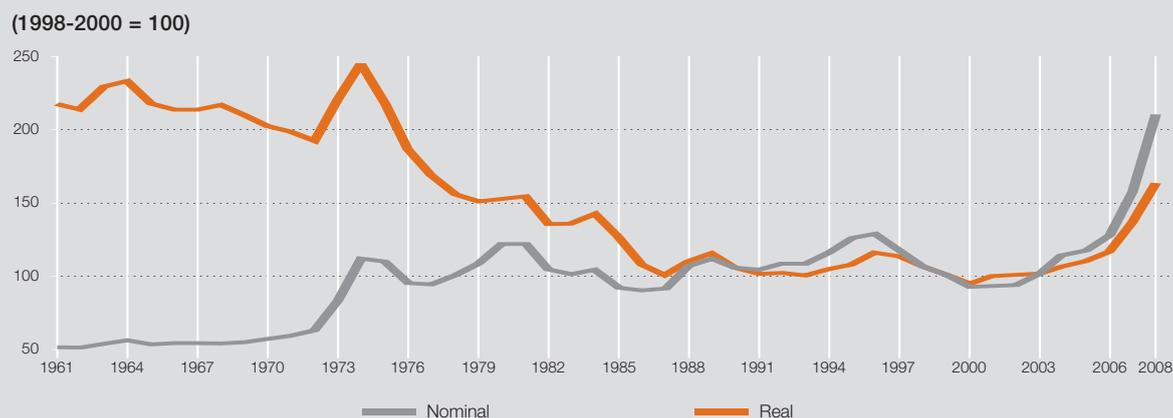
The index is a weighted average of export prices of manufactured goods produced by the G-5 economies (France, Germany, Japan, the United Kingdom of Great Britain and Northern Ireland and the United States), with local-currency-based prices converted into current United States dollars using market exchange rates. Weights are determined by the relative share in G-5 exports of manufactured goods to developing countries in a base year (currently 1995) and carry the following values: France (8.2 per cent), Germany (17.4 per cent), Japan (35.6 per cent), the United Kingdom (6.6 per cent), and the United States (32.2 per cent). The MUV tends to be dominated by movements in the cross exchange rates for the dollar-yen, dollar-euro and dollar-pound. At a time of dollar depreciation, for example, the index will rise, suggesting higher dollar-based prices from G-5 countries other than the United States. In contrast, a rising dollar will tend to lower growth in the MUV, as diminishing values of local-currency prices in dollar terms dominate the movements of the MUV index.

The recent sharp price increases reflect: (i) the rapidly rising food demand generated by the acceleration of global economic growth since the

mid-1990s; (ii) the emergence of demand for biofuel crops, especially maize, oilseeds and sugar cane; (iii) poor weather conditions in several parts of the world, especially since 2005; (iv) declining rates of productivity growth in major grain crops; and (v) declining food stocks, which fell from over 600 million tons in 2000 to around 400 million tons in 2008. The recent food price rises have triggered the introduction of export restrictions in many food-exporting countries, which have aggravated price increases. In the case of rice, for example, prices shot up after major players such as India, Thailand and Viet Nam applied export limitations. Food subsidies and other policies that tend to dampen domestic food and agricultural price rises have the effect of slowing down necessary adjustments in demand, and truncate or eliminate domestic supply responses.

Figure 2 also shows that from 1961 to 1987, with the exception of a spike in the early 1970s, real food prices, measured in US dollar terms, dropped to about half the levels seen in the early 1960s. This created huge benefits for food consumers and for poor farmers who were net buyers of food, but it also occasioned large losses

Figure 2 Extended annual FAO nominal and real food price indexes



Source: FAO

for net sellers of food who were unable to adopt new and more efficient technologies to offset the price declines, many of whom were in Africa. It thus also benefited net-food-importing countries and hurt net food exporters that were not able to offset the effect of falling prices with efficiency gains in production. Africa was unable to compete in many food commodities and therefore became a net importer of food. This decline then came to a halt in 1987, which means that the period of decreasing food prices has now been over for about 20 years. Despite the rapid rise in food prices since 2003, the real price index has not yet offset the gains of the nearly three decades to 1987. Nonetheless, more than half of that total gain has now been lost, and real food prices are again at the level of the early 1980s.

Long-term trends in real food prices may mask many factors that can strongly influence the impact of aggregate world price changes on food consumers and food producers in specific countries. We will look at three issues in the course of this discussion: exchange rates, energy and fertilizer prices, and the specific commodities involved.

### **Exchange rates**

The real price index shown in figure 2 is in United States dollar terms and incorporates changes in the exchange rates between the United States dollar and the currencies of the G-5 countries on which the deflator is based (see footnote 2). Countries that have experienced an appreciation of their currencies relative to the US dollar that is similar to the appreciation registered by developed countries included in the MUV price index need not make any further

adjustments to arrive at their real food costs. Let us consider a typical low-income country that experienced an adjustment in the real exchange rate for its currency against the United States dollar of 16 per cent between 2003 and 2007 (when most of the increase in food prices occurred) while a typical high-income country registered a real appreciation of about 12 per cent (FAO, 2008). If, for example, another country experienced an appreciation of 50 per cent against the dollar, while the average exchange rate of a given high-income country appreciated by only 12 per cent, then its real food costs in its domestic currency would not have increased by 65 per cent, as discussed above, but by 42 per cent.<sup>2</sup> But this is only a back-of-the-envelope calculation, and individual countries should carry out their own analysis based on their own import mix and trading partners.

### **Energy and fertilizer prices**

Global energy prices started to rise modestly in 1999 and then much more sharply in 2003. While nominal energy prices have more than tripled since 2003 (with petroleum prices rising more than sixfold), nominal food prices have “only” doubled. Clearly the rise in energy prices is much sharper than in food prices. The energy price increases have been transmitted to higher fertilizer and pesticide prices, higher farm machinery operating costs, and higher freight costs for inputs and outputs. For example, world fertilizer prices rose steadily from 2004 through 2006, and then soared, as shown in the table 1. The sharpest increase was for diammonium phosphate, followed by muriate of potash, with the lowest increase (63 per cent) being registered for urea.

2/ The additional appreciation of the country's currency is equal to  $50 - 12 = 38$  per cent, but this translates into a 23 per cent reduction in the new food price level of 165 per cent.

Table 1 Selected international fertilizer prices: 2007-2008

(United States dollars per ton)

Fertilizer	January 2007	April 2008	Percentage increase
Diammonium phosphate	252	1 230	388
Muriate of potash	172	500	190
Urea	277	452	63

Source: International Center for Soil Fertility and Agricultural Development.

As a consequence of energy and input costs, the cost of purchased inputs has increased much more than food prices have across the world, and this has dampened increases in food producers' profits. This will negatively impact the supply responses of producers. How much of an impact it has depends on their energy and fertilizer intensity in production, both of which are higher in the developed than in the developing world and higher in South and East Asia than in sub-Saharan Africa. Changes in energy and other raw material prices also influence countries' ability to afford food imports. While net energy and mineral exporters are likely to be able to afford the higher food prices, net energy importers confront a double shock from both higher energy and higher food prices.

### Prices of individual food groups

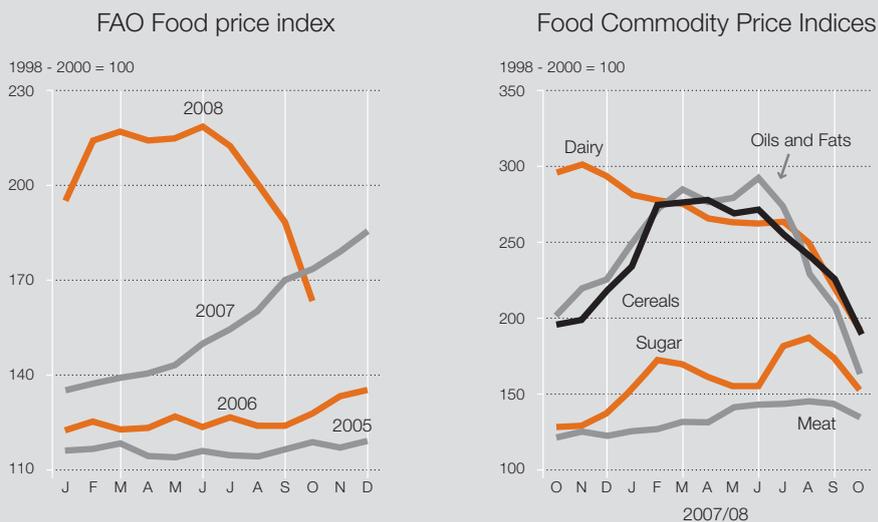
Between 1961 and 2002, the real international prices of meat, dairy and horticulture products have stayed roughly constant. On the other hand, real prices of grains, oil crops, tropical beverages, agricultural raw materials and sugar were between approximately 50 per cent (raw materials) and 100 per cent (oil crops) higher in the 1960s than they were in the five years up to 2002 (FAO, 2008). This means that price declines were heavily concentrated in basic staple foods, tropical beverages, agricultural raw materials and

sugar. The significant erosion in these prices points to a major shift in the relative prices of meat, dairy and horticulture, which, unlike some of the staples, are higher-value commodities. Only countries experiencing rapid technical change remain competitive in grains, oilseeds, tropical beverages and sugar. Another major feature of the period was high price volatility, with staggered sharp peaks in all prices other than those of dairy and horticulture products.

Figure 3 depicts movements in the nominal prices of most of these commodity groups between the base period of 1998-2000 and the year that has just passed. During this period, real prices rose about one-third less than nominal prices did. The peak in the nominal food price index occurred between February and June of 2009 when the index was around 120 per cent higher than at the beginning of the century. In the last few months the prices fell. Since then the price index fell even faster than it rose and is now about 70 per cent higher than at the beginning of the century. The sharpest increases are in the prices of dairy products, oils and fats, and grains, while sugar prices and meat prices have increased much less dramatically. Price peaks occurred between November 2007 and August 2008. As this figure makes very clear, increases in crop prices are already being reflected in meat and, especially, milk prices.

Figure 3 Nominal food commodity price indexes

(1998-2000 = 100)



Source: <http://www.fao.org>, food security section.

In order to put these recent price changes into perspective, we need to review trends over a longer period. Overall food price indexes are not available for such a period, so we will look at real grain prices. Since the 1870s, real grain prices have declined substantially. Except for price run-ups in 1910-1914, a spike in 1972-1974 and another brief blip in 1996-1998, the long-run rate of growth in supply has been greater than the rate of demand growth. Malthus is still waiting for quite the opposite to occur. Thus, the historical record is clear: a long-term decline with sharp peaks, followed by even steeper downtrends. Historically, farmers have invested excess profits in capacity, and output has expanded sufficiently to put long-run downward pressure on peak prices. The declining trend in overall food prices came to a halt in 1987, and in the case of grain prices, it ended in 2000. Therefore, the current sharp nominal price increase could well be just another bubble. In

order to better understand what is likely to happen, we now need to turn our attention to what has been driving the recent trends.

#### The drivers of demand for food

The drivers of food demand are population, income growth and urbanization. The latter two shift demand patterns away from grains towards meat, dairy products, fruits and vegetables. Population growth for the world as a whole is slowing but remains at around one per cent per year. Population growth remains much higher in the developing world than in developed regions, where it is quickly falling to zero. It remains at around slightly less than two per cent in Africa. Clearly, the main impact of population growth on demand will come from developing countries and especially from Africa and the least developed countries elsewhere. Most population growth will be in urban areas of developing countries, including Africa. Again, this suggests that Asia and

Africa will be the major source of changes in food demand patterns and the corresponding opportunities for African agriculture.

The demographic transition towards longer lives and lower population growth leads to lower dependency rates and higher labour force participation. This phenomenon (which has come to be known as the “demographic dividend” and is discussed in section 4), coupled with the wider processes of globalization, technological change, and information and financial integration, leads to prospects for global income or GDP growth that have rarely been brighter than they are now. Therefore income growth, in addition to population growth, will be one of the major factors driving the demand for food and other agricultural products.

Global per capita income growth amounted to 2.7 per cent in the decade between 1996 and 2005. In 2007 it was still at 2.6 per cent, but because of the financial crisis that hit in late 2007, it is now projected by the World Bank to fall to 2 per cent over the period 2008-2020. The developing world will see per capita income growth decline from 6.5 per cent to 5.3 per cent. But in sub-Saharan Africa, the decline will only be from 4.1 per cent to 3.9 per cent, for an aggregate growth rate that is still close to 6 per cent. Despite the global financial crisis that has erupted since the fall of 2007, per capita income growth rates will remain very high and continue to drive sharp increases in food demand.

Because of expected shifts in consumption away from rice and wheat and towards more diversified diets, growth in demand for these commodities is expected to be almost zero. Higher incomes, on the other hand, will drive demand for fruits and vegetables very rapidly, followed by poultry. Pork, beef and milk demand will expand at between 1 and 0.5 per cent. Clearly, the secular shift in relative prices from grains to foods with higher income elasticities is likely to continue and should be taken into

account in future agricultural development strategies. These demand projections do not yet reflect the impact of biofuels on land use, production and commodity mixes, however.

### Are higher food prices here to stay?

Predicting prices is hazardous at any time, but perilous in the case of long-term trends. The current situation is particularly difficult. In addition to the demand factors we have already discussed, there are many factors on the supply side: slow progress in reducing agricultural trade barriers and subsidies in rich countries; slowing yield growth; constraints on the use of biotechnology; little investment in irrigation; deterioration of existing irrigated areas; environmental constraints; loss of land to competing uses (urbanization, infrastructure, environmental set-asides); and water constraints.

Both the historical evidence that we reviewed earlier and the dramatic recent drops suggest that the peak food prices that we saw during the first half of 2008 have been yet another bubble. But it is not clear whether food prices will settle back to the same level they were in the early years of this century or to a lower or higher level. The fact that their prior long-term decline ended almost 20 years ago and that demand forces are expected to be strong makes it unlikely that they will resume their downward trend.

Within the past few months, IFPRI (May 2008), the International Monetary Fund (IMF) (March 2008), FAO (April 2008), the United Nations Conference on Trade and Development (UNCTAD) (May 2008), OECD-FAO (2008), the United States Department of Agriculture Economic Research Service (USDA/ERS) (Trostle, May 2008) and the Government of Australia (Stoeckel, June 2008) have all published analyses. *The New York Times* ran a series under the general heading “The Food Chain” from January through

June 2008, and *The Economist* has carried many articles in the last six months. These studies do not, however, agree on the causes, likely duration or ultimate end of the spike. Although they all do agree that prices will come down from current levels, there are at least four competing hypotheses (stories) being discussed which we will briefly review here.

### **Story one – Macroeconomic factors are driving price rises**

What we are experiencing is a broad commodity boom. The pattern of oil, mineral (especially gold and copper) and agricultural commodity prices suggests that broad macroeconomic variables are driving the boom. Since all global commodity markets are denominated in dollars, the declining value of this currency makes all commodities cheaper for the rest of the world, which drives up demand and prices (Hanke and Ransom, 2008). In parallel with this, United States concerns about the possibility of a recession has led to successive cuts in nominal and real interest rates, which has reduced the price of storage and encouraged economic actors to buy and hold real commodities. This phenomenon drives up all real commodity prices (Frankel 2008).

### **Story two – Speculators are driving prices up and increasing volatility**

In periods of uncertainty or recession, investors shift their portfolios into real assets, including commodities. Furthermore, the uptrend in hedge and, particularly, index funds has spurred large increases in non-traditional investments in commodity markets. These fund investors are currently going very long (betting on continued price increases) in commodity markets.

### **Story three – Simultaneous strong shocks are driving prices up**

Weather impacts in Europe in 2006 and in North America in 2006-2007, together with a continuing severe drought in Australia in 2006-2007, have drawn stocks down to critical lows. This situation, coupled with a surge in biofuel demand, has triggered a price spike that will surely end once conditions return to normal.

### **Story four – Combination of permanent structural changes in supply and demand conditions exacerbated by shocks**

This type of scenario, which predominates in the literature, argues that a confluence of long-term and transitory factors are driving the current price situation. On the demand side, rapid growth and rising incomes in emerging economies such as India and China have stepped up the rate of demand expansion. Urbanization and global growth are stoking demand for a larger and more varied food supply. Finally, at least some of the increase in biofuel demand will continue for some time to come. On the supply side, the growth rate of supply has slowed over the past decade because of declining rates of productivity gains and increased competition for water and land. Investments in agricultural research and development (R&D) have declined globally, as has investment in agricultural development. Finally, higher petroleum prices have increased the cost of agricultural production. Global grain consumption has exceeded global production in seven of the last eight years. The result has been a drawdown of stocks to critically low levels. Thus, when shocks generated by such factors as weather and the surge in biofuel demand occur, they have pushed prices up sharply.

The real explanation probably involves elements of all four stories. However, if one favours any or all of the first three, the long-run

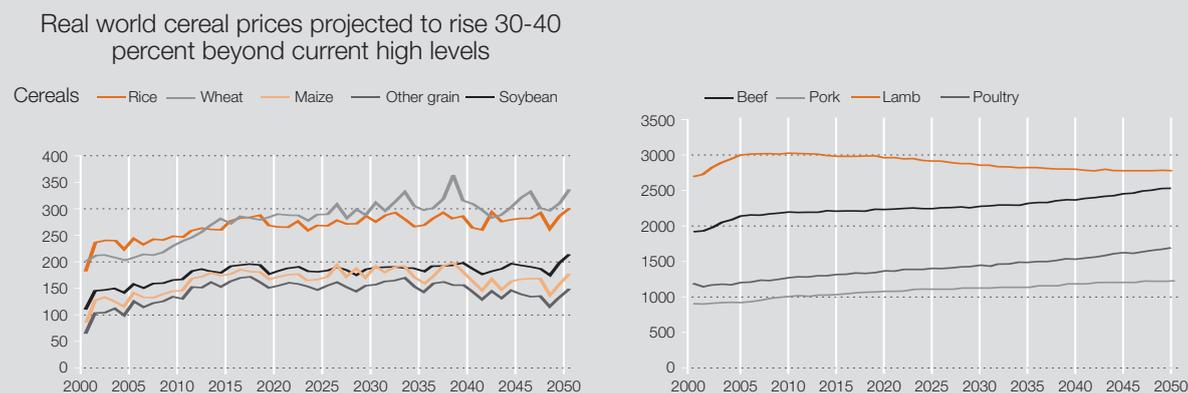
scenario is clear: when the contributing factors revert to “normal”, the bubble will burst and we will resume the same long-run downward path in real prices, as was observed in earlier episodes. Only story four proposes the possibility of a different ending. Two outcomes seem possible. After the spike, nominal prices fall but stabilize at higher real price levels and continue their secular decline, although probably at a slower rate. A second variant would be that the permanent structural changes to be implemented will be sufficiently strong to put an end to the historical pattern of declining real prices. Real prices will rise modestly over the foreseeable future. In the following discussion we will review empirical estimates that support each of these possibilities.

For 2008-2017, OECD and FAO (2008) project constant or slightly declining real prices for beef and pork. Real sugar and rice prices are expected to increase by between 5 and 10 per cent, reflecting the expected slow growth of demand in Asia and, for sugar, a high-supply response capacity. By far the highest real price increase is expected in vegetable oils (more than 50 per cent), while for

the other commodities expected real price increases range between 25 and 30 per cent. Compared with the price levels we have been seeing in the early part of 2008, this means that a number of high prices are expected to drop back significantly over the next one or two years but, even so, to remain much higher than they were in the last decade.

A recent IFPRI analysis using their International Model for Policy Analysis of Agricultural Commodities and Trade (IMPACT) model makes much longer-term projections all the way to 2050. It projects that real grain and oilseed prices will not decline from the levels they reached in late 2007 and will show a modest increase through 2050 (see figure 4 for rice, wheat, maize, oilseeds and soybeans). This is one of the first substantive analyses we have seen that seems to support the proposition that the long-term decline in grain and oilseed prices may be over.

Figure 4 Long-term crop price projections to 2050



Source: IFPRI IMPACT projections, business as usual. IPCC SRESB2 climate scenario, September 2007.

## Sensitivity of projected prices to key assumptions

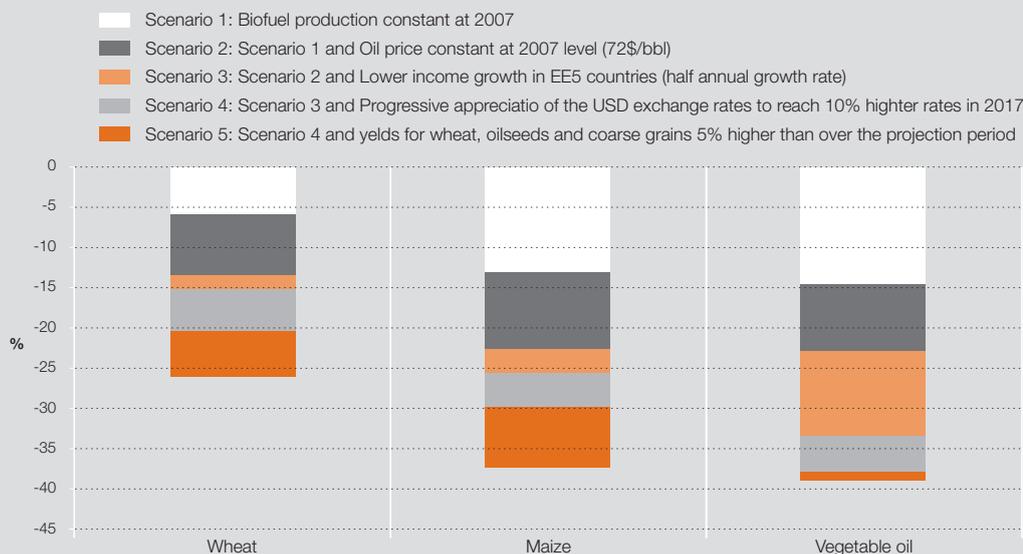
Figure 5 shows how sensitive projected world wheat, rice and oilseeds prices are to key assumptions. It graphs out the reductions in prices from the baseline projection in 2017 that would come about under five different scenarios (OECD-FAO, 2008):

- (i) Instead of rising rapidly over the next decade, biofuels production would be maintained at its 2007 level. For the two main biofuel inputs (vegetable oils and coarse grains), this would lead to a reduction of 2017 prices by 15 and 12 per cent, respectively, which is more than the change projected under any other scenario. In the case of wheat, which would be affected indirectly, the reduction would be around 6 per cent.

Simulations by Rosegrant using the IFPRI-IMPACT model point to the same conclusion. Clearly, there is no longer any question about the fact that biofuel policy and the resulting production mix will have a major impact on future food prices.

- (ii) Keeping oil prices constant at US\$72/bbl, the average 2007 level would reduce maize and oilseed prices by around 10 per cent and wheat prices by 7 per cent relative to their baseline 2017 prices. This attests to the very high sensitivity of food production costs and prices to energy prices.
- (iii) If the rate of growth of the five countries that have concluded an association agreement with the European Union, also known as the EE5 countries (Brazil, China, Indonesia, India and South

Figure 5 Sensitivity of projected world prices to changes in five key assumptions, percentage difference from baseline values, 2017



Source: OECD and FAO Secretariats

Africa), were reduced by half relative to current high projections, this would lead to price reductions in vegetable oils, which are highly income-elastic, of about 10 per cent, while it would reduce maize prices by significantly less and leave wheat prices almost unchanged.

- (iv) If the United States dollar were to appreciate by 10 per cent relative to the baseline scenario (which already incorporates a modest appreciation of the dollar), this would increase incentives in exporting countries to produce more and would reduce import demand elsewhere. The combined effect would be a reduction in all three prices of about 5 per cent relative to their baselines.
- (v) If crop yields at the end of the period were to rise by an additional 5 per cent, this would reduce wheat and maize prices by between 6 and 8 per cent but would leave vegetable oil prices relatively unaffected.

The OECD-FAO study concluded that:

“World reference prices in nominal terms for almost all agricultural commodities covered in this report are at or above previous record levels... This will not last and prices will gradually come down because of the transitory nature of some of the factors that are behind the recent hikes. But there is strong reason to believe that there are now also permanent factors underpinning prices that will work to keep them both at higher average levels than in the past and reduce the long-term decline in real terms.”

(OECD-FAO, 2008, p. 11)

## Implications of rising food prices

### Macroeconomic impacts of higher oil and fuel prices

The oil price shock has compounded the impact of higher food prices. Rising global food and energy prices are putting upward pressure on inflation rates. By early 2008, median inflation in developing countries had risen from 3.9 to 7.6 per cent. On average, for poor countries the balance-of-payments effects of oil price increases are much greater than those of rising food prices (World Bank, 2008). Most countries with the least financial capacity to import are in Africa. And it is there that the combined impact of higher oil and food prices has been especially severe. For example, the terms-of-trade impact on the balance of payments in Togo is equivalent to 19.7 per cent of Gross Domestic Product (GDP) for fuel and 4.5 per cent of GDP for food. Poorer countries have experienced disproportionately severe negative impacts. Countries such as Djibouti, Eritrea, The Gambia, Haiti, Sierra Leone, Tajikistan and Togo face potentially high fiscal costs as a result of the food and oil crisis but have a limited response capacity. Other countries, such as Indonesia, Kyrgyzstan and Lesotho also face potentially high fiscal bills but have a greater fiscal capacity to respond to the situation.

### Impact on domestic producer and consumer prices

Mundlak and Larson (1992) have shown that international food prices are fully transmitted to domestic prices over the medium or long run across both the developed and the developing world. However, in the short run, policies can slow down this transmission considerably. Developing countries have acted quickly to reduce the impact of international prices on their consumers; almost half of 77 countries surveyed

by FAO in early 2008 had reduced import taxes on food (FAO, 2008). Such reductions may worsen the fiscal imbalances that may be generated by higher food bills, however. Thus, for these countries, the achievable price reduction is sharply limited, since it cannot exceed the tax collected prior to the reduction. Consequently, even more countries (55 per cent) have resorted to food subsidies or price controls. A more sustainable approach is to draw on domestic food reserves, which may have been accumulated precisely for the purpose of dealing with episodes of scarcity arising from international price increases or domestic production shortfalls. Only about 25 per cent of countries have been able to do so, however. An even lower percentage of countries (only about 17 per cent) have responded by adopting measures to increase the food supply. Net exporting countries are much more able to influence food prices, either by imposing export taxes (recently done by Argentina) or export bans (recently done by India, the Philippines and Viet Nam). About 25 countries have limited exports in one way or another. As a consequence of these policy measures, the pass-through of higher rice prices to domestic prices ranged from 6, 9 and 11 per cent of the international price rise, respectively, in India, the Philippines and Viet Nam, all of which are net food exporters. The price rises were 43, 53, and 64 per cent, respectively, in Bangladesh, China, and Indonesia, which import some foods and export others. Argentina, a major wheat exporter, has been able to hold down the price increase for wheat to less than one-third the international price rise, while in Chile domestic prices almost fully reflect the rises in the international price (FAO, 2008).

### **Short-term impact on poverty**

In the longer run, higher food prices are good for rural population groups because they lead to greater investments, outputs, profits and rural wage rates. For economies dominated by their

agricultural sectors, there may also be important positive linkage effects on urban economies, as well as higher unskilled urban wages. The higher food prices projected for the future are therefore likely to provide important long-run benefits for many African economies and especially for rural populations.

However, these positive impacts take time to make themselves felt, and in the short term higher food prices tend to increase poverty, confronting countries with difficult political management problems. Ivanic and Martin (2008) took high-quality household data from 10 countries and used them to simulate the short-run impact of the rise in commodity prices from 2005 to 2007 on poverty incidence and depth. Longer-run impacts arising from rural linkage effects (via forward, backward and consumer-demand linkages) which come about as a consequence of the higher farm profits associated with higher output prices were not included in the analysis. Their analysis brings out the disparities in short-term poverty impacts of identical food price rises around the globe.

For urban populations in Nicaragua, which spend a large share of their income on food, the impact is equivalent to a rise of over 10 per cent in the poverty rate. Rural populations of Zambia, which are net buyers of maize, are the second most severely affected group, with a 7 per cent increase in their poverty rate. In Madagascar and Malawi, poverty rates increased by between 3 and 4 per cent. On the other hand, the rural poverty rate in Viet Nam declined by 3.1 per cent because the asset distribution in rural areas is very equal, and most of these population groups are net sellers of rice, maize and poultry. The changes registered in the depth of poverty paint a similar picture to the observed effects of changes in poverty rates.

These authors then did a back-of-the-envelope calculation to estimate the short-run global rise in the number of poor people across the world.

They calculated that the overall short-run increase in poverty in the nine countries covered by their study would have been 4.5 per cent, rather than 3 per cent. When they applied this average to the 2.4 billion people living on less than a dollar a day in the world, they found that food price rises have pushed an additional 105 million people into extreme poverty. This is equivalent to all the gains in poverty reduction which were achieved in the seven years prior to the food price crisis.

These rough calculations do not take into account all the positive impacts that higher food prices could have in the medium and long terms via forward, backward and consumer-demand linkages or via wage improvements. They therefore measure the poverty impact of what is most likely to be a transitory spike in food prices. Nevertheless these estimates are a good indicator of what policymakers must address if they are to mitigate the adverse effect on poverty levels in the short run. Clearly, this is a monumental task. It is not only the additional poor people who need help, but also most of those among the 2.3 billion who were poor before the food price spike. Small increases in safety net programmes, which rarely have significant coverage in the first place, will not measure up to the task at all. No wonder, therefore, that policymakers have preferred aggregate measures such as reductions in taxes on food, general food subsidies or price controls, releases from stocks and export controls. Of course, some of these measures are not fiscally sustainable and interfere with necessary adjustments in food production and consumption. But if these measures are indeed used only to mitigate the short-run impacts and then quickly phased out, they may well be justified.

We note here that neither IFAD nor AfDB have the mitigation of short-term shocks or the provision of safety nets as part of their mandate

and portfolios. As a consequence, the major implications of higher food and agricultural prices centre around longer-term agricultural and rural development. These topics will be discussed in sections 6 and 7.



## Economic and agricultural growth: their sources and their constraints

This section first summarizes the key findings of the report entitled “Challenges of African Growth: Opportunities, Constraints and Strategic Directions” (Ndulu et al., 2007). The report is based on an impressive body of growth research focusing on sub-Saharan Africa. Additional data on North Africa and information from other sources are also included. We will then look at the contributions that agricultural growth can make to economic development.

Growth in 41 sub-Saharan African countries for which data for the full 45-year period are available amounted to only 0.5 per cent, compared to 3 per cent in 57 countries in the rest of the developing regions, including North Africa. Growth performance has been quite diverse: 6 of 47 sub-Saharan African countries have more than tripled their per capita incomes between 1960 and 2005, 9 countries’ per capita incomes are at the same level as when they started or below, and the remaining 32 have seen modest growth in per capita income, but not enough to make a significant dent in poverty levels. Consequently, the number of middle-income countries in the region has risen from 2 in 1960 (Mauritius and South Africa) to 13. Seven of these have acquired their middle-income status largely because of mineral wealth.

The prolonged period of economic decline between 1975 and 1994 started with shocks on energy and tropical commodity markets and ended with a wave of democratic reforms between 1989 and 1994. In 1994-2004, there was more rapid per capita income growth, with 20 countries expanding more quickly than the average rate for the rest of the developing world.

Entry into this high-growth club was associated either with natural-resource exploitation (Angola, Chad, Equatorial Guinea and the Sudan), or with strong reform movements (Benin, Ethiopia, Ghana, Malawi, Mali, Mozambique, Senegal and the United Republic of Tanzania). Economic growth further accelerated in all of Africa between 2004 and 2006, thanks to strong global economic growth and higher raw material and energy prices (ECA, 2007). In 2007, economic growth in sub-Saharan Africa reached 6.1 per cent. In North Africa, it accelerated from 3.8 and 4 per cent between 1995-1999 and 2000-2004 to 5.2 and 6.4 per cent, respectively, in 2005 and 2006 (ECA, 2006a and 2007). The only subregion that is not part of this trend is Western Africa, where growth slowed down from 5.4 per cent in 2005 to 4.6 per cent in 2006 (ECA, 2007), perhaps because of higher oil prices and the appreciation of the CFA franc. The likely slowdown in global growth could, of course, threaten these gains.

Over the long haul, slightly less than one-half of the lower growth rate in Africa relative to the rest of the developing world is associated with slower growth of physical capital, while slightly more than half is attributable to lower productivity growth. The share of investment in GDP has been only about half as high as elsewhere, and for a given level of investment, Africa has achieved only about two-thirds of the average rate of productivity growth. To understand the “why” of this situation, Ndulu et al. (2007) have looked at constraints to investment incentives and returns to investment; they have also attempted to determine what sources of growth could be activated.

### **Poor resource endowments as a major negative factor**

The over 90 per cent of sub-Saharan Africa that lies within the tropics (compared with 3 per cent of the area of OECD countries and 60 per cent for East Asia) suffers from much higher incidences of diseases that impact negatively on life expectancy, human capital and labour force participation. Sub-Saharan Africa has 48 small economies with a median national income of just US\$3 billion. Forty per cent of the population lives in landlocked countries, as against only 7.5 per cent in other developing countries, and none in North Africa. This combines with a road density of only 0.13 km per square kilometer, versus 0.41 km in other developing countries. Twenty-six per cent of the sub-Saharan African countries are both landlocked and resource-poor, while 6 per cent are landlocked and resource-rich. Coastal resource-poor countries make up 43 per cent of the countries, while coastal resource-rich ones make up 26 per cent.

Resource-rich landlocked countries have done much better than their resource-poor counterparts, especially in the 1970s and since 2000. Coastal resource-poor and coastal resource-rich countries have done about the same over the long haul. Oil revenues are still poorly invested, and the recent rate of growth of the African countries benefiting from the oil bonanza has not been higher than that of the African countries that are being hurt by higher oil prices. Clearly, it is not just the presence of resources that counts, but the use of the money that is made from them. Interestingly, except during the 1960s, coastal resource-poor countries fared no better than landlocked resource-poor countries. Again, geography and natural resources do not fully determine a country's fate. Geographic isolation and poor management of natural resources may explain about one-third of the growth gap separating sub-Saharan Africa from the rest of the developing world.

### **Rapid demographic change**

The demographic transition in Africa began later than elsewhere and has progressed more slowly than in the rest of the world. This delay in the demographic transition in Africa consistently predicts two-thirds of the difference between its growth performance and that of the rest of the developing world. Lower life expectancies are also shown to contribute to this poorer growth performance, and the AIDS epidemic has made this factor much worse, especially in Eastern and Southern Africa. The current situation results in a high age-dependency ratio, which reduces saving, lowers investment in human capital, slows the growth of the labour force and, consequently, retards growth. Declines in fertility rates are linked to income growth, urbanization, girls' education, and reduced infant and child mortality rates, all of which have been delayed in Africa because of slow growth, thus contributing to a vicious cycle. Thus, as growth begins to accelerate, declining age-dependency ratios can accelerate per capita growth rates by 1 per cent or more. It would be useful to revisit the relative priority of investments in family planning.

### **Poor governance and policy**

As discussed by Collier in his book entitled *The Bottom Billion* (see section 5), three quarters of the bottom billion countries have suffered from prolonged periods of poor governance and poor policies. Poor governance can ruin the most promising prospects, as occurred in Zimbabwe, for example. These countries are not able to provide essential services that are required for growth. In some cases, part of the reason may be that resources are diverted by corruption. Poor governance and poor policies create a trap because powerful vested interests benefit from them and oppose reforms. In addition, correcting such problems requires skills from those who have often out-migrated or fled the country. Donor conditionality cannot make up for a lack of

political will or of skills. Failing States have often been caught in this trap for a very long time, and huge costs can accumulate over such periods. Collier estimates the cumulative cost of a failing State, to itself and to its neighbours, at about US\$100 billion. The benefits of helping turn around a failing State are therefore enormous (Collier, 2007).

Controlling for differences in opportunities, the impacts of poor governance and policies account for between 25 and 50 per cent of the gap in growth performance between sub-Saharan Africa and the rest of the developing world (Ndulu, 2007). Greater integration in the world economy is consistently associated with an improved growth performance. This factor operates not only at the country level, but also at the firm level.

Policies have significantly improved over the last decade, with unweighted consumer price inflation sharply falling within the space of a decade, from 27 per cent in 1995 to about 6 per cent by 2004. On average, government spending in sub-Saharan Africa, measured as a proportion of GDP, also fell steeply during that decade, as it did in other developing countries in the world as well, and the average fiscal deficit was halved to 2 per cent of GDP by 2000. Except in a few countries, exchange-rate premiums on the black market now average just 4 per cent. Through unilateral trade reforms, sub-Saharan African countries have also compressed tariff rates, and the average rate is currently 15 per cent. As a consequence of the major policy reforms initiated in the continent since 1990, growth has resumed, and the impact of poor policies on growth may have waned (Ndulu et al., 2007).

### **Deficient infrastructure and business environment**

In addition to low road densities, transport costs are among the highest in the world and can reach as much as 77 per cent of the value of exports

(ECA, 2004). What is more, sub-Saharan African farmers have to pay up to three times as much for fertilizer as farmers in Brazil, India or Thailand do. But it is not just the state of infrastructure which counts. Before the 1980s, most transport businesses in sub-Saharan Africa, including railways, bus and trucking companies, airports, seaports and civil aviation firms, were publicly owned and managed and were heavily regulated. These enterprises charged low rates, and their limited viability translated into heavy costs for both users and the national economies. Since the 1990s, transport businesses have mostly been deregulated and privatized. Concessions for operating railways, ports and airports have become common. The remaining public enterprises have been given more autonomy, and arbitrary regulation has been replaced by regulation based on consensual performance contracts. In the highway sector, the establishment of more sustainable institutions (e.g. autonomous road agencies and dedicated road funds) has become the norm and has started to show positive results (World Bank, Africa Transport Unit website).

The extraction of payments and bribes by the police and others at border crossings and roadblocks is a serious problem in Africa. "Along the West African road corridors linking the ports of Abidjan, Accra, Cotonou, Dakar and Lomé to Burkina Faso, Mali, and Niger, truckers paid \$322 million in undue costs at police customs and gendarmerie checkpoints in 1997, partly because the Inter-State Road Transport Convention had not been implemented." (ECA, 2005). Well-organized producer organizations are needed to ensure that governments crack down on these practices.

Energy costs are higher and power outages are more frequent than in any other region of the world and are particularly so when compared with China. Firm-level data from a major cross-country study show that, because of all the indirect costs of infrastructure, security and unofficial payments,

indirect production costs (other than for materials, capital and labour) make up a larger share of total costs in sub-Saharan Africa than elsewhere. In Bangladesh, China, India, Morocco, Nicaragua and Senegal, indirect costs amount to close to 15 per cent of total production costs, whereas in a sample of sub-Saharan African countries, they vary from 27 to 19 per cent (Ndulu, 2007). These higher costs diminish investment incentives and the associated returns.

### **Inadequate capacity**

A World Bank report entitled "Building Effective States, Forging Engaged Societies" (2005) concludes that a capable State requires an engaged society that holds governments accountable. Only five sub-Saharan countries were rated above the global average on State effectiveness: Botswana, Mauritania, Mauritius, Namibia and South Africa. Another seven were rated above the global average on societal engagement: Benin, Cape Verde, Ghana, Lesotho, Mali, Sao Tome and Principe, and Senegal.

Capacity development is a learning process that involves engaging existing capacities and supporting them with better incentives and checks and balances. It is not a process that is amenable to shortcuts and, unlike the technocratic approach that was often used in the past, takes into account the links among governance, policy and capacity development. This learning process therefore requires effective political leadership from the highest level of government, as illustrated by the 12 countries with greater State capacity which were studied by the task force that produced the 2005 report. Therefore, State capacity development (often including decentralization) is rarely amenable to a gradualist and incremental approach but may require "large-scale, nationwide, multisectoral, and demand-driven programs of capacity development and devolution of power and resources to local governments." The countries'

should use their own systems for allocating and managing money rather than parallel systems. The share of technical assistance funding going to capacity-building activities must increase. "This is best done by pooling the fragmented financing arrangements into a basket to fund prioritized capacity development activities or filling country-identified short-term needs... This means untying and pooling funding for technical cooperation." (World Bank 2005a, pp. 6 and 136).

While Africa has made significant improvements in basic education, progress in skills development has been distressingly slow. The sheer scale of what needs to be done to achieve growth, basic health care and improved government dwarfs the capacity on the ground. And the pandemics of AIDS, malaria and tuberculosis add to the losses. African countries should expand tertiary education enrolment and achievement. After decades of decline, many African universities are reforming themselves, pursuing self-sufficiency in finance, and partnering with the private sector. Private universities are mushrooming. We will look at the opportunities that arise in these areas for AfDB and IFAD in sections 6 and 7.

### **Underdeveloped financial sectors and low savings rates**

Sub-Saharan Africa's financial sectors are the least developed in the world. Because of high operating costs, risks of policy instability, a high degree of concentration and a lack of competition, its median spread of interest rates is 13 per cent, in comparison with 5-10 per cent in other developing regions. The lending environment across Africa is characterized by a poor credit culture, poor contract enforcement and a lack of protection for creditor rights. Access of small firms to loans is limited, and costs and collateral requirements are very high compared to those of China and India.

While South Asia and sub-Saharan Africa both had savings rates of around 10 per cent in the 1970s, between 1991 and 2003 they had climbed to

more than 20 per cent in South Asia compared to a mere 9 per cent in sub-Saharan Africa. If the resource-rich countries are not included in the calculations, the average savings rate falls to 3 per cent. Both public and private savings rates are below those of other developing regions. The reasons for this include low incomes, the low interest rates paid by banks on deposits and the scarcity of savings infrastructure. In addition, much of the savings activity that occurs in rural areas takes the form of trees, livestock, land improvements, dwellings and investment in children's education. In rural Ghana, for example, the median household saved over 30 per cent of its annual income. Mobilizing this savings capacity for agricultural development is both a major opportunity and a challenge. Poor people are kept out of formal financial systems, however, by very high balance requirements, complex administrative procedures and astronomical transactions costs in the formal banking sector. Microfinance institutions have managed to mobilize no more than a small pool of savings and have limited coverage and narrow areas of operations. High management costs have been the norm and lead to negative net worth and a high probability of failure. For microfinance to fulfil its role as a complement to formal finance, these institutions will need to become much more efficient. At the same time, the formal sector will need to reach out to poorer segments of the population by various means, including technological and process innovations.

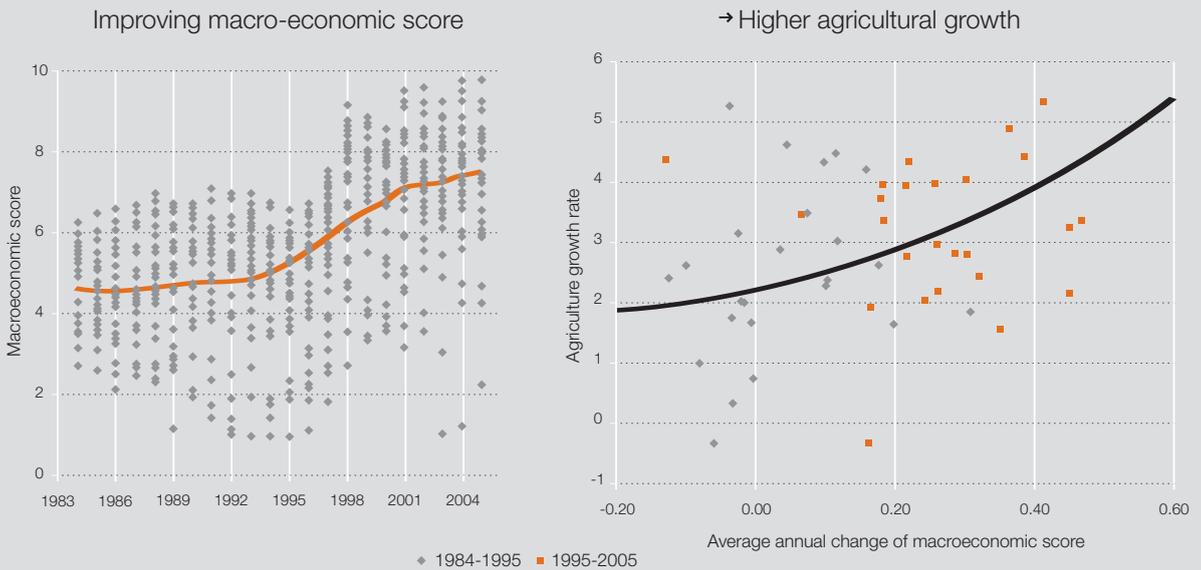
Based on their analysis of these conditions, Ndulu et al. propose a medium-term strategy that hinges on taking action in four areas (characterized as the four "I's" in their report): improving the investment climate, undertaking a big push to close the infrastructure gap with other regions of the world, focusing more on innovation as the primary motor for productivity growth and enhanced competitiveness, and building institutional and human capacity (Ndulu et al., 2007). The AfDB strategy already includes three of these areas.

### Specific factors affecting agricultural growth

Agricultural value added in sub-Saharan Africa has grown at an average of around 3 per cent per year for the past 25 years, which is close to the average for all developing countries and the same as the rate achieved in the Middle East and North Africa. The expansion of livestock herds was a very significant contributor to the increase in value added all around the world and especially so in Africa. But in sub-Saharan Africa, the rate of growth per member of the agricultural population (a crude measure of the rural population's income) has been only 0.9 per cent, or less than half that of any other developing region. Fortunately, in line with general growth trends in sub-Saharan Africa, agricultural growth has accelerated recently and reached 3.5 per cent per capita in the first half of this decade. Unlike the situation in Asia, this growth rate was achieved primarily through area expansion rather than through productivity gains.

The conditions that have led to higher economic growth have also led to higher agricultural growth. Figure 6 shows that rising agricultural growth rates have been driven, to a very great extent, by improved macroeconomic policies. In addition, agricultural policies have improved tremendously over the past two decades. These policy factors and the general environment for growth, as discussed previously, are the factors that have led to the agricultural recovery in Africa, not agriculture-specific interventions or programmes. This can be inferred from the fact that few African countries have as yet increased their investments in agricultural technology and services and, in many, such investments have continued to decline. Two additional factors that have been discussed here are the continuing adverse policies of the developed world and the striking improvements made in agricultural policies in Africa itself.

Figure 6 Macroeconomic conditions and agricultural growth



Source: World Development Report 2008.

### The continuing adverse policy environment in the developed world

Average nominal rates of assistance in the developed world peaked at over 50 per cent between 1985 and 1989. They have declined only slightly since then, to a little less than 40 per cent. The impact of this protection on world prices and trade shares is severe: the prices of cotton, oilseeds, dairy products and grains are reduced by 21, 15, 12 and 7 per cent, respectively, and the trade shares of developing countries in these commodities by 27, 34, 7 and 5 per cent, respectively. In the cases of processed meats and sugar, the impacts on developing-country trade shares are 19 and 9 per cent, respectively (*World Development Report, 2008*). The common practice of tariff escalation, whereby higher tariffs are levied on processed goods than on raw materials, further aggravates these policies' impact on the prospects for agro-industrial development. Unilateral trade reform in Africa alone would do

little to change African agricultural trade in the aggregate, as the barriers erected by the developed world and other developing countries would remain significant. But with multilateral reform of all goods globally, African agricultural and food exports would increase by 38 per cent, while imports would expand by 29 per cent. Clearly, African agriculture stands to gain the most from multilateral trade reform (Anderson and Martin, 2006). Moreover, in the absence of a breakthrough in the Doha Round of trade negotiations, China and India could follow the developed world, the Republic of Korea and the Taiwanese economy in protecting their agriculture in order to close the widening urban-rural income gap. This would shut off the principal future export opportunity for African agriculture.

While the international price reductions caused by developed-country protection measures now look small compared to the changes associated with the current price spike, they

clearly had a very adverse impact during the long period of declining and low international prices that preceded the recent upsurge. In addition, they could again have a significant impact if prices eventually settle at the same levels as prior to the spike or at only modestly higher ones. African countries have, of course, recognized the adverse consequences of these trade restrictions for agriculture and have become active participants in the trade negotiations. The price spike should not change their policy stance. The AfDB is well placed to support them through the performance of an advocacy role.

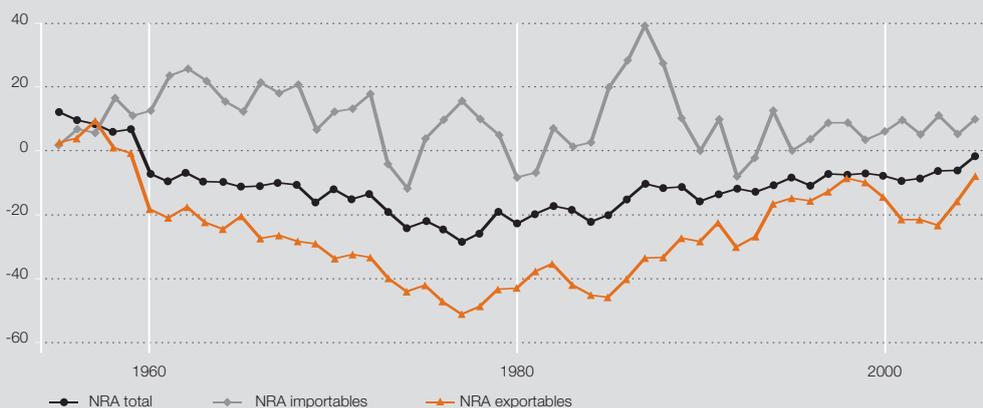
### Reducing discrimination against agriculture via domestic policies

After the end of colonization, African countries started to discriminate against agriculture via overvalued exchange rates, industrial protection and direct agricultural taxation. A major study has measured the combined effects of these three types of interventions on the net rate of agricultural assistance and compares them across the developing and developed world. As shown by the black line in figure 7, for Africa as a whole, the net protection rates have improved from

about -20 per cent in 1975-1979 to less than -10 per cent in the first half of the present decade and to near zero since 2005 (A negative rate of protection is a rate of taxation, sometimes also called “disprotection”). (see figure 7). Undoubtedly these policy improvements have been major contributors to the agricultural sector’s recovery.

As shown in figure 7, the bias against agriculture was concentrated in exportable commodities, which in the late 1970s were taxed at around 50 per cent. Importables, on the other hand, almost always had some slight degree of protection. The figure also indicates that the disprotection of exportables has declined further in the last two years. Among agricultural commodities, in the first half of this decade the nominal rates of assistance (NRAs) for tobacco, soybeans, groundnuts, cocoa, cotton, beans, beef and tea remained at between -60 per cent (for tobacco) and -20 per cent (for tea) across Africa (with the exception of South Africa). Clearly, promising opportunities for improving the incentive regime for African agriculture remain to be explored.

Figure 7 Nominal rates of assistance (NRAs) in Africa over the past 50 years



Source: *ibid*



Professor Collier and his collaborators have divided the developing world into the rapidly growing countries in which the “middle four billion” of people live and the 58 small, distressed countries with a combined population of about a billion people. Of the “bottom billion”, 73 per cent live in countries that are now undergoing or have recently been through a civil war, 29 per cent live in countries dominated by natural-resource wealth, 30 per cent live in landlocked, resource-poor countries, and 76 per cent have gone through a prolonged period of poor governance and poor policies. (Because these countries often suffer from more than one problem, the percentages add up to more than 100 per cent.) “As a result, while the rest of the developing world has been growing at an unprecedented rate, [these countries] have stagnated or even declined. From time to time they have broken free of the traps, but the global economy is now making it much harder for them to follow the path taken by the more successful majority.” (Collier, 2007, p. 99). In the trapped countries, life expectancy is much lower, infant mortality is much higher, hunger is much more prevalent, and the absence of prospects for development shrouds their populations in despair. Most of the bottom billion countries are

in sub-Saharan Africa, but they also include nations such as Cambodia, Democratic People’s Republic of Korea, Haiti, the Lao People’s Democratic Republic, Myanmar, Yemen and the Central Asian republics.

Collier (2007) uses a large cross-country data set spanning the period from 1960 to the early years of this decade to estimate the impacts of different conditions and variables on the likelihood of falling into and emerging from these traps, and the impacts of resource income and policy interventions in the countries in terms of the likelihood of achieving higher growth.<sup>3</sup>

### Conflict

For sub-Saharan Africa, Ndulu et al. (2007) provide the following data: Over 15 per cent of sub-Saharan African countries were still involved in conflicts at the beginning of the twenty-first century. The proportion of Africa’s population living in conflict situations was always much higher than the proportion of countries and peaked much earlier (at nearly 60 per cent in 1984 and then nearly 50 per cent in the early 1990s). Conflict was therefore a more important determinant of the collapse of growth in the 1980s than is usually recognized. Since 2000, progress has been made with the cessation of

3/ For a number of those relationships, the authors have to overcome endogeneity issues which could bias the estimated coefficients. They do this using instrumental variable techniques. While the underlying papers have been published in peer-reviewed journals, a number of econometricians believe that it is hard to estimate stable structural parameters from cross-country regressions and that instrumental variable techniques are a relatively ineffective tool for overcoming endogeneity problems. There is therefore still a lively debate about the reliability of the resulting estimates, especially where subtle effects are being estimated on the basis of relatively poor data. It should be pointed out, however, the policy conclusions presented by Collier et al. rely not only on the statistical evidence, but also on other bodies of knowledge and evidence.

conflicts in Angola, Liberia, Sierra Leone and southern Sudan. Conflicts in which one of the warring parties was the government have declined from 15 in 2003 to five today.

Collier (2007) shows that civil war is more likely to occur in cases where income is low, stagnates or declines and in countries dependent on oil, diamonds or other primary exports but, interestingly, not where inequality is high. Civil wars last ten times as long as international wars (which last an average of six months). Once they are over, they are alarmingly likely to restart. Civil wars reduce growth, on average, by 2.3 per cent. They sharply increase disease incidence. The end of civil war ushers in a boom in homicides. As a consequence of these factors, nearly half of all costs arise after the war is over. These costs spill over to neighbouring countries and the rest of the world. The overall cost per civil war is estimated at US\$64 billion.

### **Natural resources**

The presence of natural-resource wealth contributes to the risk of civil war. Paradoxically, even when a country is at peace, natural-resource exports reduce growth. The “resource curse” arises out of the phenomenon known as the “Dutch disease,” which alludes to the fact that resource exports lead to an appreciation of the exchange rate that makes domestic products uncompetitive in international markets as exports or as import substitutes. Sharp price fluctuations for natural resources can also lead to a boom-and-bust cycle. Resource wealth can also lead to political problems by making it easy to finance patronage politics and reducing the restraints on political power that are so important for a functioning democracy and that are provided by an independent central bank, judiciary and press, financial transparency, competitive bidding and the like. The reason why such wealth can have this effect is that governments do not need to raise taxes from their people and can therefore

ignore their wishes. Where restraints can nevertheless be put in place, they improve investment decisions and reduce corruption.

### **Landlocked nations with poor neighbours**

Around 30 per cent of sub-Saharan Africa’s population lives in landlocked, resource-poor countries. Transport costs in these nations depend less on distance than they do on how much their neighbours have spent on transport infrastructure. Because landlocked African countries have not focused on serving neighbouring markets, if bordering nations grow by an extra one per cent, these countries grow by only an extra 0.2 per cent (against 0.7 per cent for non-African landlocked countries). To increase these multipliers, these countries need to focus on expanding their own and their neighbours’ transport infrastructure (including transport to the sea), on promoting regional integration, and on reducing the external trade barriers of their entire region. They must be interested in seeing good economic policies in use by their neighbours. The above-mentioned study also argues that they need to focus on agricultural and rural development. Growing urban, subregional and international markets can provide many opportunities for these countries’ agricultural sectors.

### **Aid**

In post-conflict countries, the security benefits associated with the higher growth rates that are promoted by aid indicates that large aid programmes are economically justified. While technical assistance does not have a positive impact on growth prior to a reform effort, in post-conflict situations or during incipient turnarounds, it can help provide the enormous amount of skills needed to make up for the lack of skills that have been lost. Collier (2007) estimates a positive effect for technical assistance in the first four years of an incipient reform. Technical assistance packages should be large

and should create conditions that will allow for a productive use of subsequent aid. After that, technical assistance should be phased out as the usual objections to such assistance re-emerge. Technical assistance should be reorganized to look more like emergency relief, not like a pipeline of projects.

Other aid money early in a reform is counterproductive because it makes it less likely that reform will be sustained. After a few years of reform, the statistical effects of aid and technical assistance reverse themselves. Technical assistance becomes useless, while other aid starts reinforcing the reform process in an environment of better governance and policies. Of course, aid remains highly risky in such contexts, but, given the enormous cost of reversals, the risks are well worth taking.

In failing States, project implementation is poorer than elsewhere. Collier (2007) shows, however that money spent on project supervision in these States had been differentially effective. Therefore, in the environments in which aid agencies should be increasingly operating, they should allow for higher operational costs and budgets, especially for supervision. This recommendation runs counter to the conventional pressure on operational budgets of aid agencies. A low operational cost in failing States is the opposite of what aid agencies should look for. Donors need to adapt to these insights.

Clearly, action to help the bottom billion cannot be based on aid alone. The overall agenda includes changes in aid policy, in military interventions, in OECD laws via the promulgation of international standards and charters, and in international trade policies. Progress in connection with all of these four pillars is needed in order to change the fate of the bottom billion.

In view of the enormous costs being borne by the populations of the bottom billion countries and their neighbours, both AfDB and IFAD may need to focus more closely on these countries,

and on the roots of the problems themselves. As part of the enhanced focus on these countries, especially the pre- and post-conflict ones among them, the rigid lending allocation rules that may turn bottom billion countries into aid orphans will need to be relaxed. This will also increase the risk of the grant and lending operations of both institutions. This exposure can partially be offset by enhancing supervision resources, and therefore supervision budgets may need to be increased in these settings. The shift by IFAD towards more direct supervision of its operations is therefore a most welcome change. Finally, both institutions may need to time their operations more carefully and to focus on the rapid provision of technical assistance following an incipient turnaround or conflict resolution; this temporary situation would then give way to a strong shift towards investment lending. Closer coordination of capacity-building and investment lending with other major players will also be needed.



## The institutional pillars for agricultural and rural development

In order to seize the opportunities discussed in the previous section, Africa will have to overcome formidable challenges. In this section we will focus on the institutional challenges involved in agricultural and rural development, including the role of government, the private sector, communities and civil society, as well as the division of labour among different spheres of government. These are the institutions that have to respond to the new opportunities, and that have to work together and change in order to implement new programmes and support systems for agricultural and rural development. These are also the institutions that have to jointly and individually take on greater responsibility for providing services to small farmers. This section therefore deals with the “how” of agricultural and rural development. Well-developed, collaborative institutions are a necessity in order to tackle the “what” of agricultural and rural development, which revolves around the programmes that will have to be strengthened or developed. These topics will be discussed in section 7.

In 1980, in a typical country in Africa, young rural women or men who wanted to help develop their community would find themselves almost completely disempowered. Three of the five pillars of the institutional environment for rural development were poorly developed. The first pillar – the private sector – was largely confined to small-scale farming and the informal sector. Much of the relevant marketing, input supply and agroprocessing activities were in the hands of parastatal enterprises. The second pillar –

independent civil society, community organizations and traditional authorities – was tightly constrained or suppressed. In the wake of decolonization, central governments had suppressed the third pillar – local government – or starved it of fiscal authority and resources. Since none of these three pillars was providing much of an opportunity for young people, they had to join the central government if they wanted to contribute to their community, but the central institutions failed the rural sector miserably.

Well-structured institutions can address all the components of rural development, from health and education to infrastructure, agricultural services, social protection, resource management and more. Not only does the institutional environment determine who can contribute to development and how successful those efforts will be; it is also the most important determinant of the distribution of the ensuing benefits. More specifically, when institutions are disempowering, they can be used by strong individuals and groups to divert the benefits of development to themselves via elite capture (Binswanger, 2008).

Local development is a core component of agricultural and rural development, although the latter also involves non-local components such as transport, processing and marketing activities. No institution can carry the burden of local development on its own. Instead, the new paradigm that has emerged gives equal weight to the private sector, communities and civil society, local government and sector institutions in areas such as health, education and agriculture (World Bank, 2004). A broad consensus has been reached

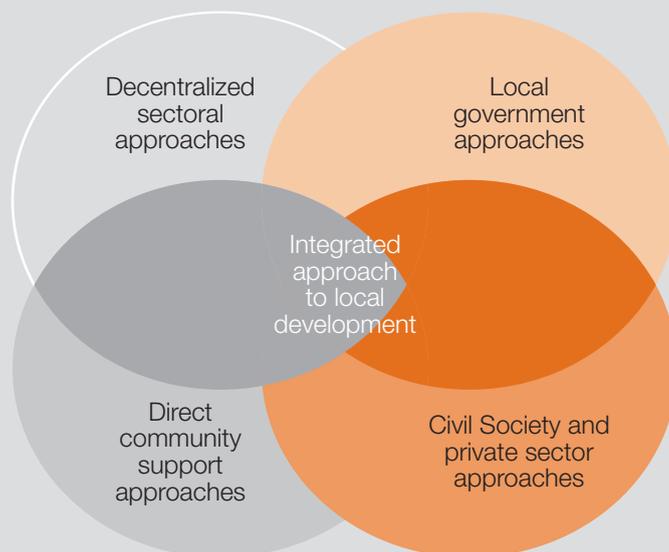
that local development (and therefore rural development) has to be viewed as a cooperative undertaking, or “co-production”, by all of these four groups of stakeholders, who need to take account of their comparative advantages, delegate functions to the other partners, and carry out internal reforms that will enable them to function under this new paradigm. How such an integrated approach can be fostered in a particular country will depend on its past history, what institutions and policies currently exist currently exists and can be built upon, the prevailing traditions and cultures, and a diagnosis of existing capacities and dysfunctions. Figure 8 illustrates this emerging consensus. The capacities of each of the relevant sectors can be scaled according to the size of the circles in a country-specific variant of figure 8. The diagrams for different countries would vary, with some having small circles for local government while others would have small circles for their communities. Only country-specific

analyses can reveal where the greatest weaknesses are and where the best opportunities are for improvements in the institutional environment. There are no universal “magic bullets”.

### Pillar 1: The private sector

We have already analysed changes currently occurring in the private agricultural sector in section 3. Here we note that the World Bank’s agricultural adjustment programmes identified the suppression of the private sector, the underperformance of parastatal enterprises, and the fiscal black holes they created as the root causes of the underperformance of agriculture. While this view was partially correct, it was too narrow. As discussed before, the withdrawal of the parastatals did not lead to a spontaneous, rapid growth of private replacements. Too many other problems existed in the business

Figure 8 An integrated approach to local development



environment, including corruption, over-regulation, and poor infrastructure and services. The sluggish entry of the private sector into input supply, marketing, rural finance, and technology development and dissemination in Africa has been particularly harmful to the development of the small farm sector, and determining the best way in which these services should be provided remains a major challenge for agricultural and rural development in sub-Saharan Africa.

Government will have to play a role in financing a number of these services, without necessarily returning to earlier failed approaches based on government provision. Conditions suitable for public-private partnerships, not only with central government institutions, but also with lower level tiers of government, will also have to be created.

## **Pillar 2: Communities, civil society and social capital**

In the 1980s the development community woke up to the important role of communities, civil society and social capital, which activists and academics had been emphasizing long before then. A broad range of NGOs started to sharply criticize donor-financed projects, policies and structural adjustment programmes (Mallaby, 2004). The focus on communities was promoted by two additional sources. In the 1980s, sector specialists in water-supply and natural-resource management had started to make a systematic effort to involve communities and had found this to enhance project performance significantly (World Bank, 1996). The other source was social funds, which quickly discovered the power of communities to assist in project design and implementation. In some of the early social funds, NGOs were used as intermediaries to substitute for the presumed lack of capacity at the community level. Although they started out by simply letting communities participate in the

design, financing and maintenance of microprojects, community-driven development programmes have moved on to truly empower them to choose, design and execute a large range of microprojects by transferring both the responsibility and the cofinancing resources for these projects to them. IFAD has been a determined champion of such community empowerment. At about the same time, social scientists discovered the merits of social capital and traditional institutions, and they are now often systematically assessed and integrated into policies and programmes (ECA, 2005a and b; World Bank, 2003b).

Social, local and community funds have greatly expanded across sub-Saharan Africa, often as part of externally financed projects, particularly those of the World Bank. IFAD puts community empowerment at centre stage in the projects it finances. A recent review of the Africa portfolio shows up such projects as those discussed by Serrano-Berthet et al. (2008). Between 1989 and 2007, the World Bank has loaned or granted US\$3.5 billion for 102 operations in about 40 countries in sub-Saharan Africa. Unlike integrated rural development initiatives, these projects have a high rate of satisfactory project completion, although their sustainability ratings are more problematic. They have transitioned from enclave projects to undertakings that are more integrated into the decentralization architecture of countries and that serve as an important instrument for fostering decentralization along with community empowerment. Such funds have also been very useful in assisting communities to recover in post-conflict and other emergency settings. The question as to how to adapt them to such settings is discussed in Cliffe et al. (2003).

While NGOs have become a player in agricultural and rural development all over Africa, their capacity as service providers in Africa has been more limited than in South Asia. In the

countries with low population densities, they tend to concentrate around major cities and find it hard to operate in remote rural areas. Using NGOs as implementers and intermediaries in community-driven development programmes proved to be costly and has increasingly been abandoned in favour of direct empowerment of communities with knowledge and resources. NGOs are, of course, important facilitators, sources of knowledge, innovators, and advocates for change in agricultural and rural development sectors.

The formation and progressive development of independent farmers' associations and microfinance institutions are particularly important in this connection (World Bank, 1994). These types of organizations are increasingly replacing or complementing cooperatives, many of which were created by the State and did not result in genuine empowerment. The growth and development of communities, NGOs, and social capital are important for the implementation of development programmes, and the diversity and strength of these organizations are a defence against elite capture of programmes and project benefits.

A recent review compared the development of producer associations in Mozambique, Nigeria and Zambia with what has occurred in Brazil and Thailand. "Effective producer associations thrive in a democratic environment that provides a favourable climate for civil society organizations in general. A really active role in defending smallholder rights, including those to land and favourable contracts, has emerged in Brazil and Thailand. Africa's smallholder rights, however, are still poorly developed. Although a significant start has been made, few African associations have been able to develop themselves and their commercial linkages sufficiently to take on a major role in service delivery. And many continue to be heavily dependent on donor support. While farmer's organizations have become significant

stakeholders in discussions of agricultural policies, they have not yet been able to generate the strong political will in favour of agriculture which has propelled development of the Cerrado and of North East Thailand." (Binswanger, 2007).

### **Pillar 3: Local government**

During the late 1980s, democratization in Latin America, and later in other parts of the world, led to the restoration or strengthening of local governments. Another factor was the inability of central States to deliver services in widely heterogeneous environments. But decentralization was often viewed as a dangerous development because provincial and state governments were perceived as being fiscally irresponsible. Fortunately, by the mid-1990s, negative views on decentralization had given way to a more balanced assessment (Faguet, 1997; Piriou-Sall, 2007; World Bank, 1995).

Equal emphasis on political, administrative and fiscal decentralization is needed. Unsuccessful decentralization programmes are almost always characterized by an inadequate allocation of fiscal resources to the local level (Manor, 1999; Shah, 1994). Successful decentralization is often pursued by strong leaders in relatively strong States and puts a great deal of emphasis on accountability at all levels (Manor, 1999). Local governments can, of course, become an instrument for elite capture and corruption. To prevent this, they must be democratic institutions, but that in itself is not enough. Without strong communities and civil society, and a strong private sector, local governments will not be subject to the scrutiny and the bargaining processes that are needed to make local development inclusive and efficient.

In the early 1990s the World Bank first discovered the power of local governments as expressed in its community-driven development

programmes in Mexico (World Bank, 1994) and later in north-eastern Brazil. The innovation spread from there to Indonesia and East Asia, then to Africa and the rest of the world. Social funds started to build the capacity of local governments and to entrust them with coordination and some implementation functions, and eventually the distinction between community-driven development and social funds disappeared. A research programme on decentralization, fiscal systems and rural development in the mid-1990s strengthened our understanding of this nexus of issues (McLean and Williams, 1998; Piriou-Sall, 2007). As part of this programme, an analysis was undertaken of the level of decentralization of rural service delivery in 19 countries (or provinces thereof) across the world. Four African countries had the lowest decentralization scores, while Jiangxi province in China scored the highest. Latin American countries scored in the upper half, while Karnataka State of India ranked ninth and Punjab, Pakistan, thirteenth. The recent African governance report of the ECA (2005) indicates that not much progress has been made in the last 15 years, as the 28 African countries that were covered by the study still received some of the lowest scores of all, out of an entire series of governance indicators, for decentralization and corruption.

In most OECD countries and in high-performing China, local governments perform functions relating to education, health, social protection, the environment, agriculture, land, local and community infrastructure, and the promotion of private-sector development. They are a multisector coordination tool, even though their coordination capacity is invariably imperfect. There are powerful reasons for using the lowest level of local government for coordination and execution of rural development tasks. At the local level, people have direct

knowledge of the local conditions. Transparency is relatively easy to achieve, since people can often verify the result of expenditures with their own eyes. Given the heterogeneity of rural areas, coordination of the sectors involved in rural development at the central level is almost impossible. Empowered and properly resourced local governments can mobilize latent capacities in communities and at the local level. And finally, local governments do exist in remote areas where neither NGOs nor the organized private sector usually operate.

#### **Pillar 4: Sector institutions**

Despite their shortcomings in terms of rural development, until 1980 sector institutions were the main focus of donor-financed programmes. There has been a growing realization, however, that sector institutions should delegate implementation to the private sector, to communities, civil society organizations and local governments based on the principles of subsidiarity<sup>4</sup> and comparative advantage. Instead of providing services and implementing programmes, they should formulate policies, set standards, and enhance and control quality (World Bank, 2004). Far from involving a withdrawal from R&D services, such a change would strengthen the capacity of the overall system to provide these services, including the public and quasi-public goods so badly needed by small farmers.

The sector institutions specifically associated with agriculture and natural resources have often performed particularly badly. Agricultural credit institutions have not only achieved little for small farmers, but they have also been fiscal black holes that primarily benefit the better-off farmers.

<sup>4/</sup> The principle of subsidiarity states that functions should be allocated to the lowest level capable of effectively performing them while at the same time minimizing adverse spillover effects to neighbouring units at the same or higher levels.

Ministries of lands have lacked an effective constituency to ensure proper budgets and are often highly centralized and corrupt. Ministries of agriculture are often weak and politicized and are poor providers of small-farmer services. They have a great deal of difficulty performing important public-good functions, such as collecting the necessary data, monitoring sector developments, analysing sector policy issues, and designing and implementing appropriate agricultural policy regimes and programmes. As discussed in section 4, efforts to reform individual sectors one by one have had little success. Transformation and de-concentration of sector institutions is probably better done via cross-sector governance and public-sector reforms.

### **Pillar 5: The central government**

Despite the changing development paradigms discussed in section 2, central government still performs the ultimate design, oversight and coordination role for national development programmes, including those focusing on rural development. It also finances many of the public and quasi-public goods provided in the areas of education, health, and agricultural and rural development services, including services that small farmers need to prosper. But central government is becoming less and less involved in direct service delivery and execution, except in the areas of defence, taxation, management of expenditures and of the intergovernmental fiscal system, and electoral processes. Central government has a particularly important role to play in bringing about the changes needed for successful co-production among the four institutional pillars discussed above, including public-private partnerships. It has to carry forward the process of community empowerment and decentralization of functions, resources and accountability mechanisms to local governments

and to end users, and it needs to ensure that sector institutions undertake the thorough-going internal changes that they need to make. It also has to make sure that the business climate for the private sector improves and that communities and civil society are free to take on their co-production functions.

Today, the young people about whom we spoke at the beginning of the section can operate much more freely in the private sector within a steadily improving business environment. In most countries and commodity sectors, they can now join a producer association. They can also help their community by engaging in a wide variety of community-driven initiatives for which funding is becoming available more systematically. They can work for one of many NGOs and either use their technical skills in NGO-facilitated development programmes or employ their advocacy skills in NGOs. In countries such as Senegal or Uganda, a number of functions formerly carried out by ministries of agriculture are either being privatized or are being performed by producer associations, which are often partially financed by the State, and young people may work in one of these services. Finally, most countries have pursued decentralization initiatives, and young people may work on behalf of their localities either as staff members in local government or as elected counsellors. Unfortunately, however, progress in decentralization has been slow in most countries other than Burkina Faso, South Africa, Uganda and a few more. Elsewhere the process of administrative decentralization, i.e., the transference of functions to local governments, has been slow. And even where it has proceeded more rapidly, fiscal decentralization has been lagging badly, leaving most local governments with little resources to execute their mandated functions, let alone take a leadership role in local development.

### **The capacity of agricultural and rural institutions**

Compared with the situation in 1980, the institutional environment for agricultural and rural development has improved significantly. While no studies have been conducted to measure the impact of improved institutions on agricultural growth, there is little doubt that these improvements, in addition to fostering macroeconomic stability and improved price incentives, are one of the explanatory factors for the recent acceleration of agricultural growth.

As discussed in section 4, efforts to develop the capacity of agricultural and rural institutions would flourish in the context of a broader national capacity development strategy and programme. This cannot be done by means of a top-down approach to the provision of capacity development services. Instead, it is a process of learning by doing, in which communities, local governments, farmers' organizations and private-sector actors are given opportunities and resources and can exercise control over their own development. In particular these actors should be provided with mandatory training. In particular these trainings should focus on diagnostic and planning, financial management and reporting, procurement, and monitoring and evaluation. Other training should be provided largely on a demand-driven basis. Capacity development must build on the considerable latent capacities that are found in rural areas all over the world. To do so, rules and regulations for programme execution must be made much more participatory and empowering, and complex features that destroy latent capacity or hinder its mobilization must be discarded (Binswanger and Nguyen, 2005).

Finally, as emphasized in the 2004 *World Development Report* on making services work for poor people, the broader sector institutions involved in agricultural and rural development need to become much more accountable to their clients.

AfDB and IFAD have promising opportunities for fostering the institutional environment for agricultural and rural development. Influencing rural institutions should be part of the country and regional strategy development of both institutions. AfDB has a full range of instruments that it can employ to foster institutional development at a national level through both policy change and capacity development. The impact of IFAD is likely to be more selective and to focus on such activities as building the capacity of local governments in rural development, empowering communities and farmers' associations, and fostering local public-private partnerships.



## Current opportunities and challenges for African agricultural and rural development

The InterAcademy Council (2005) cites the following unique features of sub-Saharan African agriculture that represent special challenges in terms of agricultural performance: (i) dominance of weathered soils of poor inherent fertility; (ii) predominance of rainfed agriculture, little irrigation and very limited mechanization; (iii) heterogeneity and diversity of farming systems; (iv) key roles of women in agriculture and in ensuring household food security; (v) poorly functioning markets for inputs and outputs; and (vi) a large and growing impact of human health on agriculture. Unlike what has occurred in Asia, growth has primarily been achieved through area expansion rather than productivity gains. But these challenges have to be seen against the backdrop of the great opportunities arising from unused and under-used arable land and from higher commodity prices, as well as within the context of the generally improved growth environment in Africa that we have reviewed in previous sections.

In this section we will examine the immense opportunities for future agricultural growth that rising commodity prices are opening up for African agriculture. We will then go on to explore the remaining challenges to be overcome in order to achieve a further acceleration of agricultural and rural development in Africa and to use it to promote poverty reduction and food security. This discussion will be divided into the five broad headings of demographic, social and health issues and safety nets; agroclimatic, biophysical and natural resources management;

agricultural profits and rural investment; agricultural technology; and the imperative of regionalization.

### Where are the short- and medium-term market opportunities for Africa?

In section 3 we analysed the driving forces behind the changes occurring in the international prices of agricultural commodities. While the current price spike poses major short-run policy challenges for many countries, the international market outlook for agriculture appears to be very positive in general. Where will the new market opportunities for African farmers lie? The bright international market outlook for food products does not necessarily mean that the best opportunities are in global markets (Poulton et al., 2007; World Bank, 2009). Since Africa has become a major food importer, African producers compete in these markets at import parity prices rather than at the lower export parity prices. In addition, quality standards are not as high and phytosanitary barriers are lower than in international markets. The combined value of domestic and regional markets for food staples within sub-Saharan Africa is considerably in excess of its total international agricultural exports (Diao et al., 2006). Africa's demand for food staples is projected to double by 2020. Moreover, an increasing share of output will become commercialized as the continent becomes more urbanized. Bottlenecks in road and export infrastructure in sub-Saharan Africa are likely to be removed only gradually, but as progress is made in

this regard, their elimination will reinforce opportunities in domestic and regional markets. Nevertheless, as a recent analysis of IFPRI on the prospects in East and Central Africa indicates, “among agricultural sub-sectors for which there is large and growing domestic and regional demand, staples loom large as a group. Production and sale of these ‘poor man’ crops can be pathways out of poverty for millions of eastern and central Africans.” (Omamo et al., 2006).

The fact that domestic and subregional markets for food crops present the best opportunities does not mean that there are no opportunities in international markets. Unfortunately, sub-Saharan Africa has yet to record any significant global export success in low-value commodities (e.g. grains, cassava, soybeans) that can be grown in a wide range of locations, with or without mechanization (Poulton et al., 2007). If appropriate policies and investments are put in place in the relevant areas, including those of transport infrastructure and technology, the past need not repeat itself, however.

This does not mean that Africa should not seize the opportunities that present themselves in terms of export commodities in general, horticultural products, or fair trade and organic agriculture. While the potential volumes are not as large in these areas as they are in domestic and regional food markets, they are significant and have considerable direct and indirect employment impacts, and they are being seized by an increasing number of countries, with Kenya in the forefront. Similarly, there are numerous examples of benefits arising for African producers from fair trade initiatives, as, for example, in coffee. Moreover, since many African producers use no chemical inputs at all or use them only on a very limited scale, they should be able to access many niche opportunities in organic agricultural products.

Subregional trade could be a relatively efficient way of smoothing out the impacts of droughts on production and prices at country and subregional levels. There are many physical and institutional

impediments to cross-border trade within Africa, including differences in food safety requirements, rules of origin, and quality and product standards. More importantly, for a long time trade in food staples was discouraged by national food policies that placed a high priority on self-sufficiency, and vestiges of these policies still remain in many countries. One of the biggest impediments to large-scale private investment in cross-border trading capability – particularly in Southern and Eastern Africa – is the unpredictable behaviour of governments in imposing export bans whenever they fear that food shortages may occur in their own markets.

The fact that domestic and regional markets are the most promising areas in terms of agricultural growth means that, despite the supermarket revolution and rising international quality standards, small farmers will be better placed to seize those opportunities as they arise. This is a good thing for most IFAD programmes. These conclusions also indicate, however, that both institutions will need to focus more closely on improving access and trade in regional and subregional food markets.

## **Demographic, social and health issues, and safety nets**

### **Demography and employment**

Despite HIV/AIDS and declining fertility, the general population growth trend in Africa is still around two per cent per year. In section 4 we discussed the possible demographic dividend and, in section 7, the implications in terms of the demand for agricultural products. Despite rapid rural-urban migration, these high population growth rates mean that the absolute number of rural people will continue to grow in sub-Saharan Africa, and poverty will remain concentrated in rural areas for a long time. In the Middle East and North Africa, the absolute

number of youth will peak in the next 25 years.

Sub-Saharan Africa is home to over 200 million people between the ages of 12 and 24. The demographic transition, which will lead to a reduction in the proportion of young people in the population, has barely started, and a decline in absolute numbers will come only in the distant future. The poor quality of primary education severely limits young people's opportunities: in many countries, fewer than half of women aged 15-24 can even read a simple sentence, and their drop-out rates are very high. Young adults are at greatest risk of HIV/AIDS, and the less time they stay in school, the more vulnerable they are. In Kenya, the probability that a 20-year-old may die before age 40 is 36 per cent, but it would be only 8 per cent in the absence of HIV/AIDS. Another factor in the reduction of their populace is that many young people become combatants and lose future opportunities as a consequence. Such people number 100,000 in the Sudan alone (*World Development Report*, 2007).

As in all regions, unemployment is concentrated among the young. In most countries, youth unemployment accounts for more than 50 per cent of the total, and employment is the key concern among them (*World Development Report*, 2007). Among women, including young women, a low labour force participation rate persists. Schooling for both young men and women has increased, but it is still insufficient to ensure gainful employment for the young generation.

Both IFAD and AfDB already place priority on generating productive employment and improving the domestic investment environment. Since agriculture has a high employment intensity, both directly and via its linkage effects, a greater focus on agriculture in the AfDB strategy would reinforce the focus on employment.

### **Migration, remittances, and the brain drain**

According to IFAD et al. (2007), Africa has over 30 million people in the diaspora. The most

predominant migrant flows, however, are within the region and usually involve movements from poorer countries to less poor countries. As a consequence, the average percentage of migrants in the total population of a given country is 7 per cent, but this figure rises to 20 per cent in countries with a population of less than one million. There is also a significant level of international migration to former European colonial powers such as France, Italy, the Netherlands and the United Kingdom.

"Remittance flows to and within Africa approach US\$40 billion. North African countries such as Egypt and Morocco are the continent's major recipients. East African countries depend heavily on these flows... For the entire region, these transfers are 13 per cent of per capita income..." (Africa Focus Bulletin, p. 9, 2007). Annual average per capita remittances are US\$83, and remittances per migrant are US\$1,358. Clearly, remittances represent a major opportunity for Africa. "Rural remittances are significant and predominantly related to intraregional migration, particularly in Western and Southern Africa..." (ibid., p. 9). Transfer costs are higher than for other regions of the world, partly because of the financial restrictions imposed by most African governments. As a result, the informality of money transfers and the emergence of monopolies are issues that need to be addressed. "In West Africa, for example, 70 per cent of payments are handled by one money transfer operator" (ibid.).

Over the past 10 years, developed countries have selectively dismantled barriers to immigration of highly skilled people. As a result, the proportion of educated persons has increased among migrants across the world. In Eastern Africa the percentage of skilled workers living in OECD countries rose from around 18 per cent in 1990 to around 20 per cent in 2000, while for West Africa the corresponding numbers are 20 per cent and over 25 per cent.

While the welfare effect for migrants will generally be positive, Kapur and McHale (2005) identify four effects that migration has on the welfare of those left behind in the countries of origin. The prospect channel of migration increases the incentives of those left behind to obtain more education in areas that will increase their prospects for migration, such as nursing or accounting. Countries that invest sufficiently in their higher education infrastructure could therefore assign value to education as an export and benefit from remittances. As will be discussed in greater depth in the section on agricultural education, there are many institutions and graduates, but quality remains a serious issue for both potential migrants and for agricultural development at home. Without sufficient skills at home, on the other hand, the absence channel measures the economic loss to the country of the person actually leaving: the difference between what the emigrant was adding to the economy and what he or she was being paid. In addition, absence may reduce a country's capacity to reform and build its own institutions. The diaspora channel focuses on the impact of the diaspora. Many African countries, including Senegal and South Africa, are both host to diasporas from other countries and contributors to diasporas directed towards more advanced countries. They may therefore both benefit from remittances and be a source of them, and may receive skills as well as sending them. Finally, the return channel represents the ways in which returning emigrants who possess enhanced human and financial capital are contributing to their home countries. Clearly, the impacts of the brain drain are not all negative, and the effects of this phenomenon can be improved through judicious policies and actions.

Kapur and McHale show that solutions to brain drain problems involve actions on the part of developed as well as developing countries. In developed countries, improved human capital planning could help to avoid skills shortages in

health and education, while higher education reforms in developing countries could enable private-sector higher education institutions to offer more instruction in skills for which there is a heavy international demand. Other possible measures focus on controls and on compensation.

While AfDB has instruments for enhancing education policies and capacities in the region, IFAD can help to improve the local agricultural investment environment so that recipients of remittances find it more attractive to invest them in agriculture.

### **Gender equity**

In many parts of the developing world, women make up a majority of the agricultural labour force and, in sub-Saharan Africa, they represent a majority of the farmers. Ambler et al. (2007) state that "Poverty and hunger cannot be conquered without meeting the specific needs of poor women. Like poor men, they lack the assets and income necessary to exit poverty, but poor women and girls are also subject to a confluence of gender-based vulnerabilities that keep them trapped in poverty. Women have fewer benefits and protections under customary or statutory legal systems than men; they lack decision-making authority and control of financial resources; and they suffer under greater time burdens, social isolation, and threats or acts of violence."

While the issues of gender inequalities now seem to be better understood, the international establishment still appears to be slow to respond. Holmes and Slater, in comparing the 2008 World Bank *World Development Report: Agriculture for Development* to the *World Development Report: Agriculture and Economic Development*, published in 1982, conclude that "Comparing how gender equality is analysed in the recently published 2008 report to the 1982 report indicates that much progress has been made... Nevertheless, significant gaps remain in the 2008 report." (Holmes and Slater, 2007, p. 1). "For all its

merits, there are also substantial areas in the 2008 report that lack important gender analysis. The report focuses very little on the impacts and implications for the global economy, such as the impact of deregulated and liberalised economic policies, and global agricultural trade markets, on gender equality and subsequently, for growth and poverty reduction... The report also lacks a rigorous analysis of some key gender-specific constraints – for example, women’s reproductive responsibilities or cultural barriers – when identifying mechanisms for increasing the role of efficient and equitable labour markets in enabling agricultural growth and poverty reduction. Furthermore, at both the household and community level, the 2008 report does not discuss the economic constraints to improving women’s participation in farmers’ organisations or community committees” (ibid., p. 2).

The Independent External Review of FAO (2007) finds that while gender is given greater prominence at high levels it has not yet been fully mainstreamed at the programme or country level. Johanson and Saint, in their analysis of agricultural education in Africa, conclude that “Although women play multiple roles in agriculture and account for more than half of agricultural output in the continent (and three-quarters of food production) they have continuously received a less-than-proportionate share of investment in agriculture, particularly in terms of interventions relating to education, extension, capacity strengthening, empowerment, and market access” (World Bank, 2007c, p. 25). Finally, the Commonwealth Secretariat notes that “It is clearly evident that there has been very little attention to gender issues in the international processes concerning the development of climate change, whether in protocols, treaties or debates around them.” (Commonwealth Secretariat, 2007, p. 7).

Changing gender norms in a society is a difficult and slow process that is far from

complete in the developed world. Growth and economic opportunities for women have been a main factor in driving such change, again putting the emphasis back onto achieving higher growth. As noted earlier, in many countries, fewer than half of all women aged 15-24 can even read a simple sentence, and their drop-out rates are very high. Thus, the challenges to be met in terms of gender equity in access to education and health care are formidable. As both IFAD and AfDB have recognized, proactive steps to foster change in gender norms and opportunities involve mainstreaming the gender agenda into all the activities of domestic and external development actors. Since there is no “magic bullet”, this is the only way to make progress. The IFAD external evaluation (2005) and recent annual report (2006) acknowledge the need for even greater proactive engagement in order to move this agenda forward.

### **Security of access to resources**

Farmers will rarely invest in fixed assets unless they have secure land rights. While traditional tenure systems have often provided secure, inheritable usufruct rights, in many parts of Africa they are now coming under pressure from rising population density and increased market access (World Bank, 2004; ECA, 2005). They have also often failed to provide secure tenure rights to women and to manage the potential conflicts which arise when immigrants need to be accommodated and the enclosure of pastures threatens the livelihood of herders. Assisting these systems to evolve is therefore a high priority. This has been a topic of intense interest in Africa in recent years. The United Kingdom’s Department for International Development (DFID) sponsored a workshop in 1999 which yielded a valuable compendium of information which was later published under the title of *Evolving Land Rights, Policy and Tenure in Africa*. Deininger’s recent book, *Land Policies for Growth and Poverty Reduction*

(2003), contains a detailed chapter on Africa and, most recently, the CGIAR Systemwide Program on Collective Action and Property Rights (CAPRI) has released a set of 12 policy briefs in a volume entitled *Land Rights for African Development: From Knowledge to Action* (2006). Moreover, in *Reforming Land Rights in Africa*, Ngaido argues that "...ensuring access to and control over land for poor and marginalized rural households, women and groups (equity) are critical policy objectives for promoting agricultural growth and combating poverty in Africa" (2004).

Excessive inequality in land ownership tends to reduce access to land and the efficiency of its use (Binswanger, Deininger and Feder, 1995). Large-scale farms in a wide range of countries – from Brazil to the Philippines, Zimbabwe and Namibia – have under-utilized their land and have relied on subsidies to reduce their dependence on hired labour via mechanization. Small farms, on the other hand, do not have enough access to capital to make their operations more efficient and raise their profits. As a consequence, both farm sectors suffer from an efficiency loss. For these reasons, the World Bank has become a major player in land reform programmes in countries that still have a significant land reform agenda (Binswanger and Deininger, 1995). However, there is still a great deal of controversy regarding the best way of implementing land reform, and this has slowed down progress in the countries that are most in need of it (Van den Brink et al., 2006).

For all of these reasons IFAD has made land rights systems a priority in its programmes. It is hosting the secretariat of the International Land Coalition and is therefore well-placed to exercise strong leadership in this area. Developing the capacity of land administration institutions could be an area of action for AfDB.

### **Rural HIV/AIDS and agriculture**

Following the wave of HIV/AIDS infections by around a decade, the wave of deaths from

HIV/AIDS is now fully upon us. This has led, in a number of countries, to a stabilization or slight decline of HIV prevalence rates. The third wave of orphans has also started but is as yet far from its peak, with predictions that it could reach 20 million in Africa in the next decade. Rural areas are now suffering almost as much as urban areas and may be hit even harder by the orphan crisis, as many orphaned urban children are returned to rural homes.

The prevalence of HIV/AIDS varies sharply across the countries of sub-Saharan Africa for reasons which are still poorly understood. Four countries in sub-Saharan Africa have prevalence rates above 20 per cent. Another seven have prevalence rates of between 10 and 20 per cent, while seven have rates of between 5 and 10 per cent, and 26 have rates below 5 per cent. The nine countries of southern Africa and the Central African Republic will experience the biggest demographic impact. The impact on the age structure of these countries is distressing. In 10 years, southern Africa went from having one-third of annual deaths corresponding to the working-age population to two-thirds. It is unclear whether fertility will increase or decrease. So far population growth rates have not turned negative in any country in sub-Saharan Africa, but age-dependency ratios will increase, and this will have a dampening effect on economic growth rates.

While a significant body of indirect biomedical evidence suggests that poor nutrition and parasitic infections may make a person more vulnerable to HIV infection, major epidemiological studies cast doubt on this conventional wisdom and instead suggest that food intake and nutrition are not major determinants of differences in prevalence rates. In longitudinal studies in Africa, the median survival rate after infection with HIV was estimated at between eight and nine years in the absence of anti-retroviral treatment. These survival rates are only about 20 per cent lower than the survival rates in OECD countries before the

advent of anti-retroviral therapy, leaving little room for food intake and nutrition to be an important determinant. Binswanger (2006), therefore, concludes that anti-retroviral therapy, rather than food or nutrition interventions, is the only way in which survival rates can be significantly increased.

Mather et al. (2004) conclude that AIDS will result in a roughly constant number of working-age adults. Many affected agricultural households quickly recruit new adults, and the agricultural labour shortages deriving from AIDS are likely to induce urban-rural labour migration. It is likely that HIV/AIDS will progressively decapitalize heavily affected rural communities, and the increasing scarcity of capital (land, savings, cattle, draft animals) that this will cause may come to impose the greatest limit on rural productivity and livelihoods. The IFAD focus on all of the assets of the rural poor is therefore as applicable to households that have experienced a death from HIV or any other cause as it is to any other household affected by a negative shock.

Orphans usually face serious psychosocial consequences following the loss of one or both of their parents. Extended families are most likely to choose better-off members as the fostering parents. As a consequence, studies have shown that orphan-fostering households are not necessarily the poorest and most vulnerable ones (Rivers et al., 2004). On the other hand, households with more than one orphan reported significantly more food insecurity and hunger than households with no or only one orphan.

Analysis of a longitudinal data set in Kenya (Yamano and Jayne, 2004) shows that the death of an adult male household head is associated with a larger negative impact on household crop production and on non-farmer income than any other kind of adult death. In addition, the Kenya data indicate that the impact of adult mortality on household welfare is more severe for households

in the lower half of the per capita income distribution (i.e., the target group of IFAD).

### **Interventions to combat HIV/AIDS in rural areas**

We have seen that agricultural and food and nutrition interventions are not likely to be highly effective in halting the spread of the disease or the progression of an infected individual from infection to death. Instead, direct prevention interventions are required that will make anti-retroviral therapy widely available in rural areas. On the other hand, agricultural, food and nutrition interventions are likely to be important in mitigating the impact of the disease on affected households. And better and more food may also help ensure patients' adherence to anti-retroviral therapy. These differences are important for the design of rural HIV/AIDS interventions.

In rural areas of Africa, prevention interventions require not only inter-personal communication, but also participatory involvement of entire communities. This approach has been used in the Tanzania-Netherlands Project to Support AIDS Control (TANESA), which was scaled up to include all the villages in an entire district. IFAD has a comparative advantage in participatory approaches. Therefore, all its rural development interventions should be designed to contribute to mainstream HIV/AIDS prevention efforts. This does not necessarily have to be a costly effort, as the operations already in place are strengthening community institutions that can be entrusted with the task. Mainstreaming HIV/AIDS prevention should certainly receive as much emphasis as other mainstreamed agendas, such as improving gender relations and the management of natural resources.

The World Health Organization (WHO) guidelines for HIV/AIDS treatment, including anti-retroviral therapy (WHO, 2004), have been designed in such a way that a nurse in a rural health post, without laboratory equipment, can

use syndromic management (i.e., diagnosis based solely on observable symptoms) to diagnose advanced HIV disease and prescribe a standard first-line treatment for adults. The WHO guidelines recommend the strong involvement of communities in the provision of the other components, such as training in healthy living and survival skills, provision of food and nutrition, and adherence support. This again is an area in which IFAD has a comparative advantage. It therefore needs to closely follow what is happening in terms of the scaling up of AIDS treatment in rural areas. Then it should provide assistance via its projects wherever possible.

Care and support include psycho-social support, health care, home-based care, education, food and nutrition interventions, and livelihood support. The consensus that emerges from the literature is that providers of care and support should take a holistic approach to the needs of affected families and individuals, rather than dealing with sector-specific interventions one at a time. However, very few holistic and community-based care and support initiatives have been scaled up. We have seen that HIV/AIDS impacts are highly differentiated depending on who is sick or dies in a family, how well off the household was before experiencing an HIV/AIDS impact, and how large and well off the extended family network is. Therefore, only a fraction of the affected households and individuals need care and support interventions from the outside. Because of the stigma attached to AIDS, attempts to provide support exclusively to families and individuals affected by HIV/AIDS are often problematic. Also, why direct support only to families who have chronically ill HIV/AIDS patients, rather than all families with chronically ill patients, or why aid only HIV/AIDS orphans, rather than just orphans? Care and support to HIV/AIDS orphans should therefore be approached within the framework of a broad community-driven social safety net.

### **Rural safety nets**

The rising tide of orphans in sub-Saharan Africa is an important reason to focus more on safety nets. Additional reasons are mounting food prices, and disruptions from globalization and global warming. Employment generation programmes have often been used as partial social safety nets, sometimes as part of social funds and other local development funds (Serrano-Berthet et al., 2008). Unlike what has been done in South Asia, however, their size and scope have been fairly limited. While very helpful, they leave out a number of people who cannot work. Clearly, they have a role to play in the future expansion of safety nets. In sub-Saharan Africa, South Africa, Botswana and Namibia have developed significant cash transfer mechanisms to assist a number of the most vulnerable groups, such as the aged, the disabled, children and people living with HIV/AIDS. These mechanisms operate in both rural and urban areas. Financing such cash transfer programmes may be beyond the reach of many of the poorest countries, however. An alternative approach would be to strengthen traditional community safety net mechanisms along the lines discussed in the box below.

Neither IFAD nor AfDB currently focus on emergency relief or safety nets. In the case of IFAD, this is because its target group is the poor who can be helped by improving their productivity. However, many poor rural people are either too young or too old to earn their own livelihood. Also, some are disabled by accident or disease. Since safety net operations would inevitably focus on enabling the young to stay or become healthy and to acquire skills, assisting them to do so will prepare them to become beneficiaries of traditional IFAD programmes. IFAD's traditional skills in working with communities would be well applied.

### Burkina Faso Proposal for Scaling Up Social Protection

Communities and individual families are already part of an informal, if inadequate, social protection system. But they do need additional resources and support to expand these informal mechanisms into a more systematic effort and to finance support for education, health care or home-based care, etc. These resources should be provided as matching grants to the relevant communities, with the latter providing the matching resources in cash or in kind (for example, food needed by the most vulnerable groups).

While communities all over Africa are able to identify vulnerable families and to classify them by degree of need, they are not able to carry out proper needs assessment for these families, a task which normally is done by a social worker. In Sanmatenga, there are nearly 300 villages and urban neighbourhoods, but only three trained social workers, and there is no way the Ministry of Social Action can hire enough social workers to assist communities to do this job. Just as in the areas of agricultural extension, health, or veterinary medicine, it is therefore necessary to develop a system of community-based social workers. Communities should select one or several members to be trained in basic family needs assessment and supervision skills; these people could then be remunerated via daily allowances to be paid out of the community grants. The Ministry of Social Action would need to develop a curriculum, training programme and supervision programme for this purpose.

Assisting the chronically ill, orphans and the families which take care of them will require significant additional training of enough community members to manage these tasks. These community members cannot work as volunteers for a long period of time, and they therefore need to be provided with modest remunerations, such as per diem payments for every day they work or every home visit they make.

Community members will encounter situations which they or the community as a whole cannot handle, such as medical emergencies or child abuse. Proper referral systems need to be put in place so that difficult cases can be handled by health professionals, social workers or educators with the required skills. These same specialists need to be involved in designing and delivering the training and to be available for facilitation and training on demand.

The same committee structures that were used for prevention efforts at the provincial, district and community level, the same training teams, and the same financing mechanisms can be reinforced and used to coordinate, manage and monitor the social protection programme. In particular, the committees can coordinate and provide financial resources to NGOs and local offices of the relevant government services so that they can become the facilitators and trainers and can serve as a referral system.

Source: Hans Binswanger (personal observations).

### Agroclimatic, biophysical issues and natural resources management

The global population passed 6 billion in 1999 and will likely exceed 9 billion by 2050. Combined with higher incomes, this will increase competition for land in many ways (e.g., space for housing, recreation, infrastructure and waste disposal). Similarly, more people, most living in urban settings, will demand more water and will produce

more liquid and solid waste. Intensification of agriculture can cause water pollution, erosion and salinization. We may understand these pressures individually, but the collective regional and global impacts receive less attention.

#### Africa's land resources

The *African Development Report 2007* notes that "Land is a critical natural resource in Africa and the basis of survival for the majority of Africans.

...If sustainably managed, the African landscape, a rich and dynamic mosaic of resources, holds vast opportunities for the development of human well being." (p. xvi). Land degradations caused by nutrient depletion, soil erosion, salinization, pollution, overgrazing and deforestation are clearly major issues in African agriculture. The InterAcademy Council Study (2005, p. 49) says: "Depletion of soil fertility is a major biophysical cause of low per capita food production in Africa... Smallholders have removed large quantities of nutrients from their soils without applying sufficient quantities of manure or fertilizers to replenish the soil." The World Bank Independent Evaluation Group report agrees, using different references: "Low soil fertility is a major contributor to the low productivity of African production systems... Only 6 per cent of the land in the Region has high agricultural potential." (1995, p. 14).

It is troubling that most of the evidence is, however, anecdotal and is based on local soil surveys and multitudes of plot studies (Stocking, 1996). As far as we can determine, there has *never* been a comprehensive soil survey for most of Africa and, beyond soil vulnerability maps, there are no current or historical soil degradation maps. There is substantial evidence of low fertilizer use, and data on crop yields support the notion of low fertility. Fortunately, the Global Environment Facility has recently funded a global Land Degradation Assessment in Drylands (LADA) project which is being executed by FAO, the United Nations Environment Programme (UNEP) and a number of collaborating institutions. This project's work is based on worldwide satellite measurement of vegetation covers in 8km x 8km grids, with national and local follow-up. Local follow-up focuses both on hotspots, i.e., the areas with the most land degradation, as well as bright

spots, i.e., areas where degradation has been reversed. It appears that, both globally and in most places, vegetation cover has increased over the past 25 years, except in a number of hotspots, such as the former homelands of South Africa (personal communication from Dr. Freddy Nachtergaele, LADA Coordinator). A full analysis of the results has not yet been published, however.

Neither higher population nor poverty necessarily leads to land degradation.<sup>5</sup> In the transition from long fallow systems to permanent agriculture, soil fertility decreases, and farmers eventually have to introduce new techniques to stem and reverse this decline. They tend to do this during the evolution of the farming system to higher land-use intensity, as detailed by Ester Boserup (1965) and Hans Ruthenberg (1976). Their theories are consistent with an increasing number of studies which have shown that the normal processes of land improvement associated with agricultural intensification are taking place in many countries (Pingali, Bigot and Binswanger, 1987; Tiffen, Mortimore and Gichuki, 1994; and Kaboré and Reij, 2004). Significant cases of soil degradation, on the other hand, are usually associated with open access regimes, insecurity of tenure and other policy failures which impede the normal investment responses of individuals (Heath and Binswanger, 1996). Clearly, the alarmist view that, in many parts of the developing world, land is being rapidly and irreversibly degrading may be an exaggeration.

This does not mean that desertification and soil erosion are not problems worthy of attention, but simply that we can be more optimistic than the usual rhetoric implies. Global attempts at dealing with the issues of desertification and the related issue of biodiversity loss are dealt with in the conventions on

5/ CGIAR Science Council 2006.

desertification and biodiversity. The new initiative of the Bill and Melinda Gates Foundation and The Rockefeller Foundation, Alliance for a Green Revolution in Africa, has identified soil health as one of its priority programme areas. In its 2007 article entitled “Desertification and Land Degradation Threaten Africa’s Livelihoods”, the World Bank describes what action it is taking. “To tackle the problem of land degradation more forcefully in sub-Saharan Africa, in 2005 the World Bank and its partners, including the New Partnership for Africa’s Development (NEPAD), launched the TerrAfrica initiative tasked with promoting sustainable land management practices by mobilizing coalitions, knowledge, and scale up financing.”

Climate change, desertification and biodiversity losses come together in the local government arena and at the community and farm level, requiring management and adjustment capacities. Conventions in all three areas provide financing opportunities, and IFAD is hosting the Global Mechanism, a financing instrument for the United Nations Convention to Combat Desertification. Capacities to harvest the funds at the level of producers, local and national governments, and subregional organizations are also needed, and capacity development opportunities therefore exist in this area for both IFAD (farmer organizations) and AfDB (national and subregional levels).

### **Africa’s water resources**

Developing and managing water supplies costs money, but some people see access to water as a right, and people often overuse a free resource. In both developed and developing countries, water use in agriculture is often highly wasteful, as a consequence of past subsidies for the development of irrigation and low water and electricity rates. Powerful vested interests defend these privileges. As a result, improved water use efficiency, so necessary for managing the competition for water, is rarely achieved. If these issues are not addressed

in the rest of the world, Africa may once more be hit with rising food prices as a consequence of increasing global water “scarcity.”

Water is crucial to Africa’s development but it is becoming increasingly scarce. To quote IFAD’s *African Development Report 2007*, “Available statistics reveal that nine African countries already face ‘water scarcity’ on a national scale (less than 1,000 m<sup>3</sup> of water per person annually), eight countries face ‘water stress’ (less than 1,700 m<sup>3</sup>), while at least another six countries are likely to join this list in the coming decades. More than 300 million people in Africa still lack access to safe water and adequate sanitation. The majority of these people are in sub-Saharan Africa, where only 51 per cent of the population has access to safe water and 45 per cent to sanitation. By 2025, almost 50 per cent of Africans will be living in an area of water scarcity or water stress.” (p. 12). While in the aggregate Africa would seem well endowed with water, having 17 major rivers and 160 lakes, the distribution of these endowments is very uneven spatially and temporally. For example, the Congo River basin receives over 35 per cent of Africa’s annual rainfall but is home to just 10 per cent of Africa’s population. This means that, in some areas (North Africa and Southern Africa), there is a high degree of dependence on groundwater, while in others, major rivers routinely dry up for several months a year. Despite limited irrigation development, agriculture is responsible for 86 per cent of water withdrawals. Furthermore, the major rivers cross several national boundaries, making water development more complicated.

The InterAcademy Council report provides useful additional points: “...The implication of water scarcity for much of Africa, especially in semi-arid farming systems, is that more water-efficient farm management systems will be needed. They will incorporate drought-tolerant varieties, choose species with higher water use efficiencies, and use crop and simulation

modeling for increased water use efficiency, but they still will not be sufficient. ...Most of the additional investment should not be in classic large-scale irrigation systems. There is considerable potential for capturing rainfall through improved soil surface management practices, small water harvesting systems and small-scale irrigation systems, enabling intensification of farming and crop diversification in inland valleys, and in upland systems using supplementary irrigation of high-value rainfed crops." (2005, p. 51)

### **Irrigation and drainage**

The The Green Revolution in Asia has shown how important water control is in making high levels of input use profitable. In India, new varieties and higher input use spread first to those areas with the best water control in the northwest and south, and then moved east and to central areas later, partly as a consequence of farmer investment in irrigation and drainage, and partly because research made high-yielding varieties available for dryland crops. Sub-Saharan Africa is lagging badly in terms of irrigation and drainage: less than 7 per cent of cropland in Africa is irrigated, compared with 33 per cent in Asia (Gelb et al., 2000). Large-scale irrigation has suffered from the effects of unaffordable costs and a centralized bureaucratic institutional structure. While models for changing these institutions into autonomous entities that would be partially or fully controlled by farmers have been successful in some countries, such as Mexico, and in the case of the Office du Niger irrigation scheme, this approach has not yet been replicated in many countries, and even rehabilitation is therefore often not yet a viable option. Small-scale irrigation is a more promising option, but investments are constrained by the low profitability of agriculture and the resulting low investment capacities of the farmers involved. Thus, the future development of irrigation capacity will need to be carefully planned within the context of increasing competition for water.

### **Africa's forests**

Forests cover 22 per cent of Africa's land area, and African forests make up 17 per cent of global forest cover. In contrast, extreme deserts cover 43 per cent of Africa's land area. African forests range from open savannahs to closed tropical rainforests. The AfDB *African Development Report 2007* concludes that "Deforestation, forest degradation, and the associated loss of forest products and environmental services are serious challenges facing African countries. The size of natural forests and woodlands in Africa has been drastically reduced over the last century." (p. 25). Degradation not only reduces economic returns from forest products but also contributes to losses of biodiversity, increases the rate of erosion, reduces water quality and increases the risks of flooding in surrounding areas. While the particular issues pertaining to forests differ considerably across the various regions in Africa, there is obviously a strong need for all development programmes to be sensitive to potential impacts on forest resources. This would include any increase in the amount of forested areas brought under agricultural production. Again, as in the case of water resources, transboundary issues are very significant.

### **Africa's fisheries**

Africa is a marginal and declining player in world fisheries. Africa's total production was slightly less than 8 million tons (5.6 per cent of global output), with the breakdown being 4.8 tons from marine capture (5.7 per cent of the global total) 2.5 tons from inland capture (26 per cent of the global total) and 0.7 tons from aquaculture (1 per cent of the global total). Marine capture has stagnated, and aquaculture has grown only slowly. Two countries, Egypt (82 per cent) and Nigeria (8.6 per cent), account for over 90 per cent of aquaculture production (FAO, 2006 (Sofia)).

Per capita fish consumption in Africa is below the global average level of per capita availability

and is declining. In 2004, per capita global availability was 16.6 kg, while in Africa consumption in 2003 was 7.6 kg per capita, down from 9.9 kg per capita in 1982. NEPAD's analysis in advance of its Fish for All Summit is instructive: "The fish sector makes vital contributions to [the] food and nutrition security of 200 million Africans and provides income for over 10 million engaged in fish production, processing and trade. Moreover, fish has become a leading export commodity for Africa, with an annual export value of US\$2.7 billion. Yet these benefits are at risk as the exploitation of natural fish stocks is reaching [its] limits and aquaculture production has not yet fulfilled its potential." (NEPAD, 2005, p. 4). A growing part of the value of trade in fishery products comes from exports of highly valued fresh Nile perch to Europe from Kenya and Uganda.

"Strategic investments are needed urgently to safeguard the future contribution of Africa's fish sector to poverty alleviation and regional economic development. Broadly, investment is needed to: (i) improve the management of natural fish stocks, (ii) develop aquaculture production, and (iii) enhance fish trade in domestic, regional and global markets. In support of this investment, capacity needs to be strengthened at regional and national levels for research, technology transfer and policy development. As a first step, stakeholders in the region need to build a common and strategic understanding of the importance of fisheries and aquaculture for Africa's development and of the challenges being faced by the sector" (ibid., p. 4). "... if per capita consumption is to be maintained at present levels up to the year 2020, capture fisheries will need to be sustained and where possible enhanced, and aquaculture developed rapidly, with an increase of over 260 per cent in sub-Saharan Africa alone over the course of the next 16 years" (ibid., p. 5).

Current concerns revolve around three sets of issues. The first is the continuing decline of

coastal fisheries, alleged to be caused by foreign fishing fleets, and the consequent impacts on the income of traditional artisanal fishers. Two recent news releases highlight the issue in rather stark terms. A release posted by the Institute for Security Studies on 2 October 2007 defines the issue in its title "The crisis of marine plunder in Africa", and the Gristmill blog headline of 18 July 2007 is "West African fisheries being destroyed". The second is the need for improved management of inland capture fisheries, which are comparatively more economically important in Africa. The third is the need to rapidly expand aquaculture production. The NEPAD plan of action lays out an ambitious set of investment proposals. Progress to date appears to be mainly on the side of capacity-building and research (NEPAD, 2007).

All of these natural resource management issues relating to land, water, forests and fisheries are highly interdependent and will become more so with increased population pressure and rapid urbanization. The challenges for both IFAD and AfDB are to find ways to incorporate sustainable natural resource management into programmes aimed at promoting growth and poverty reduction.

### **Are poor natural conditions a constraint on agricultural growth and commercialization in Africa?**

Some of the past marketing successes in sub-Saharan Africa depended on agro-ecological conditions that were "ideal" for cocoa, tea, coffee, sugar and some other commodities. In some of these cases (e.g., tea and coffee), the market pays high quality differentials, and the desired quality attributes can only be obtained where particular growing requirements are fulfilled. Therefore, global players (either traders or processors) have to access supplies from certain African countries in order to satisfy their customers. Success in these commodities has thus taken place despite the fact that many of the best growing regions are landlocked and remote. On the other hand, ideal

agricultural conditions are not sufficient for success, as is shown by the example of the slow-growing Zambian sugar industry, which enjoys some of the best growing conditions in the world. While there is a major sugar factory in Zambia, it has been unable to export sugar other than to the protected European market. Other success stories in Africa, such as the cotton and cassava industries in West Africa, are associated with favourable, but not ideal, climatic and soil conditions. These crops involve highly labour-intensive production processes that are difficult to mechanize, and producers have therefore benefited from low labour costs in Africa (Poulton, et al., 2007). Beyond Africa, spectacular agricultural success has been achieved in landlocked areas of at best moderate agroclimatic potential with little irrigation in the Cerrado region of Brazil and in north-eastern Thailand.

### **Marginal versus favoured areas**

With the accumulation of more experience and knowledge, the debate about this topic has led to the conclusion that this may be a false dichotomy. Investments in both types of areas are necessary, and both may be profitable under many circumstances. The *World Development Report* defines less favoured areas as ones that are constrained by poor market access or limited rainfall. Using mapping overlays of both factors, an attempt is made to define where these areas exist (World Bank 2007b, *World Development Report 2008*, pp. 55-57). The 2008 report clearly lays out possible strategies for less favoured areas, arguing that public policy interventions to reduce poverty and preserve the environment are warranted in many of these regions. Despite past arguments that investments in

such areas do not pay, there are now analyses that support the conclusion that "... public investments in roads, education, irrigation, and some types of research and development (R&D) can produce competitive rates of return (Fan and Hazell, 2001) and positive outcomes for poverty and the environment in less favoured areas." (World Bank 2007b, *World Development Report 2008*, p. 192). The recommended strategies are "... based on two key interventions: (1) improving technologies for sustainable management of land, water, and biodiversity resources; and (2) putting local communities in the driver's seat to manage natural resources." (ibid., p. 193). The actual number of people living in marginal areas does not decline until a very advanced stage of urbanization is reached. Outmigration is not a solution to the problems associated with marginal areas. What is needed is a means of harnessing all available economic opportunities. If such areas have been relatively neglected, as in India, rates of return to investment may be as good as in better-endowed areas. For example, Ethiopia has still a huge backlog in connection with small-scale irrigation.

Nevertheless, a development approach to these areas has to empower the local populations with the authority and sufficient fiscal resources to provide the necessary human development and social services, so that new generations will have the human capital they need if they choose to migrate. Those who choose to stay behind can then combine remittances and social assistance with locally earned income in order to attain a decent living standard. As Foster and Rosenzweig (2003) have shown, such areas may also be able to achieve some degree of industrialization based on their lower labour costs.<sup>6</sup>

6/ Foster and Rosenzweig have shown that, in India, rural industries have located primarily in areas which benefited relatively little from the Green Revolution and the subsequent increase in agricultural development and where rural wages were generally lower. Rural industrialization has therefore reduced rural poverty and inequality among and within rural areas. Rapid growth of rural industries in the 1990s followed an increase in the overall growth rate of the economy, which was itself partly a consequence of improved agricultural development and may have been aided by restrictive labour laws whose impact and enforcement may be more limited in rural areas than in urban areas. It is not clear how much these lessons apply to underperforming countries which are suffering from low overall and low agricultural growth.

### The future of small farmers

On the related issue of the role of small farms in growth and poverty reduction, a new and insightful paper has been published by Peter Hazell and his colleagues (Hazell et al., 2007), who make a very good case for policy support for small farmers in both favoured and particularly less-favoured areas. Their conclusions are very pertinent for this report: “In conclusion, the case for smallholder development as one of the main ways to reduce poverty remains compelling. The policy agenda, however, has changed. The challenge is to improve the workings of markets for outputs, inputs, and financial services to overcome market failures. Meeting this challenge calls for innovations in institutions, for joint work between farmers, private companies, and NGOs, and for a new, more facilitating role for ministries of agriculture and other public agencies. New thinking on the role of the state in agricultural development, wider changes in democratization, decentralization, and participatory policy processes, and a renewed interest in agriculture among major international donors do present opportunities for greater support to small-farm development. But unless key policymakers adopt a more assertive agenda toward small-farm agriculture, there is a growing risk that rural poverty could increase dramatically and waves of migrants to urban areas could overwhelm available job opportunities, urban infrastructure, and support services” (p. 32).

### Enhancing agricultural profits and rural investment

Even in a good institutional environment, few of the needed investments will be made if agriculture is not profitable. This is obvious in the case of on-farm investments, but none of the other institutional pillars will be in a position to invest unless agriculture and agro-industry are

profitable. Unless they can save, communities will not have the means to finance or cofinance their investments. Independent civil society organizations (rather than outside agencies) must finance a share of their costs from local sources, and these again depend directly or indirectly on profits from agriculture and other natural resources. Local governments which do not mobilize part of their own resources tend not to be accountable to their constituencies (Manor, 1999) and to be vulnerable to elite capture. The local tax base, in turn, depends on agricultural and natural-resource profits.

It is sometimes assumed that private agricultural investments can be financed via credit. But even where institutions for rural finance could be built, their success depends on the borrowing and repayment capacities of the farmers involved, and both of these capacities depend critically on agricultural profitability. There is therefore no shortcut to capital accumulation in agriculture except via higher profits and, ultimately, higher savings and investment levels based on these profits.

It is often assumed that rural non-farm activities can be an engine of growth for rural development. But most rural non-farm activities produce goods and services that are linked to agriculture via forward, backward and consumer-demand linkages (Hazell and Hagbladde, 1993; World Bank, 1983). The advantage offered by lower rural wages in terms of industrialization is frequently offset by other disadvantages of a rural location. Therefore, the potential for rural industrialization is usually over-estimated. Agriculture, therefore, remains the single most important driver of the rural non-farm sector. Based on this discussion and the analysis presented in other sections of this report, we will now summarize the remaining challenges to be met in order to improve agricultural incentives.

### **The inadvisability of protection of importables and subsidies for exportables**

Sub-Saharan African countries have already altered their own policies and eliminated the sector's overall disprotection (see section 4). However, they still have fewer agricultural incentives than other regions of the world, especially the OECD countries. It would be tempting for African policymakers to attempt to further improve agricultural incentives by following the example of OECD countries and subsidizing their agricultural exports or restricting imports to protect their producers. However, as shown in section 4, on average African countries already provide protection for their agricultural importables. Raising these protection levels further would in many instances tax poor consumers, and increase poverty, rather than reducing it. In the context of the current agricultural price boom, it would be more appropriate to lower the protection levels than to raise them. Increased protection of agricultural importables would also often lead to higher protection levels for these products than for industrial goods and would therefore indirectly disprotect them. The possibility of subsidizing agricultural exports is constrained by the poverty of these countries and is a very inefficient way of supporting the agricultural sector compared to the use of scarce fiscal resources for the expansion of infrastructure, technology development and smallholder services. In addition, such subsidies would infringe WTO rules if the Doha Round of negotiations were to succeed.

### **Input markets**

The *World Development Report 2008* argues that developing efficient input markets is a necessary prerequisite to expanded use of improved seeds and fertilizer in sub-Saharan Africa. Yet these markets are subject to highly seasonal demand for small quantities which are dispersed over wide geographic areas with little infrastructure.

The *World Development Report* shows that domestic port and transport costs represent up to 50 per cent of farm-gate fertilizer costs in Malawi, Nigeria and Zambia, compared with slightly over 25 per cent in the United States. Scale economies in fertilizer production are substantial, so for the vast majority of small African countries, domestic production is infeasible. In fact, as noted by the *World Development Report*, cost-effective minimum import lots of 25,000 tons are "...considerably above the annual demand in most Sub-Saharan African countries." (World Bank 2007b, *World Development Report 2007*, p. 150). Again this underlines the need for regional approaches and offers opportunities particularly to AfDB to support regionalization.

This also raises the perennial issue of fertilizer subsidies, which is addressed in detail in the *World Development Report 2007* (box 6.7, p. 152). The 2007 report puts forward a proposal for what it terms "market smart" subsidies targeted at poor farmers which would be designed to encourage initial use of incremental amounts of fertilizer. It also notes that widespread use of fertilizer subsidies is expensive. Zambia spent 37 per cent of its public budget for agriculture in 2004-2005 on its fertilizer support programme, for example. Of course, other inputs will become important in the commercialization process as needs for tools, machinery, pest management and possibly irrigation equipment emerge. Market-oriented agriculture requires access to functioning input markets. The challenge is how to encourage and support their development.

### **Rural finance**

One critical input market is rural finance. The macroeconomic instability that characterized Africa well into the 1990s has resulted in exceptionally high real interest rates. Agriculture is rarely so profitable that it can compete with urban investments in such environments. In addition, rural areas in general and small farmers

in particular face crippling disadvantages in financial markets. Clients are usually small and widely dispersed, and seasonality and covariant risk make financial intermediation difficult (Binswanger and Rosenzweig, 1986). While cooperative institutions have been a success for larger farmers in middle-income countries such as Brazil, specialized agricultural financial institutions have been a failure all over the world (World Bank, 1996). The microfinance movement can make a modest contribution, but it has found it difficult to overcome the disadvantages associated with rural areas and emerge as an important agricultural lender (Gine, 2004).

Successful approaches to improving rural financial intermediation have been focused on savings mobilization, postal systems, improved access to finance for the rural non-farm sector, input suppliers, marketing systems and contract farming (Yaron et al., 1998). The Government of India has obliged commercial banks to open rural branches and to reserve a proportion of their lending for agriculture and agro-industry. Two separate studies have shown that these measures have had a significant impact on agricultural growth and rural wages (Binswanger and Khandker, 1995).

In light of the above analysis, it is not surprising that both IFAD and AfDB have found it difficult to achieve more than spotty success in the area of rural finance in sub-Saharan Africa. Yet both of them put rural finance high on their agenda in their agricultural programmes. An alternative approach to fostering rural investment is to focus on agricultural profitability in general and support for effective, easily accessible and low-cost savings mechanisms, such as postal savings systems linked to rural savings clubs. A complementary approach would be to finance more agricultural and rural investments via matching grants, with the matches coming both from community contributions in kind from individual savings.

### Output markets

The same problems which hinder input markets also impede the development of output markets. Most of these problems have already been discussed: low population density, the disadvantages of being landlocked, poor road and port infrastructure, high transport costs in connection with given types of infrastructure, illegal extraction of payments along transport routes, insufficient competition, poor financial markets and the resulting high cost of finance, and a business environment that is only slowly improving. The market development of food crops is also impeded by frequent and unpredictable government interventions in the market. Fortunately, farmer associations are increasingly entering input and output markets, although a great deal more support will be needed if they are to achieve the kind of prominence they have in East Asian countries or Brazil, for example. The *World Development Report 2008* provides a comprehensive analysis of how to foster output markets in general and the participation of producer organizations in particular. As we discussed earlier in this section, intraregional trade in basic commodities offers real possibilities for African agriculture but is constrained by serious barriers to trade.

### Barriers to intraregional trade

Intraregional trade offers major opportunities for sub-Saharan African agriculture. Domestic demand for most agricultural commodities is price- and income-inelastic, and rapid gains in production will therefore inevitably lead to lower domestic prices and quickly reduce increases in farm profits. Moreover, a high degree of volatility in production translates into high price variability and risk. Opening subregional trade can reduce the impacts of these factors and increase regional food security. Intra-African trade in agriculture has accounted for no more than a small share of total African trade, but that share has risen from 11 per cent to 18 per cent over the period (see

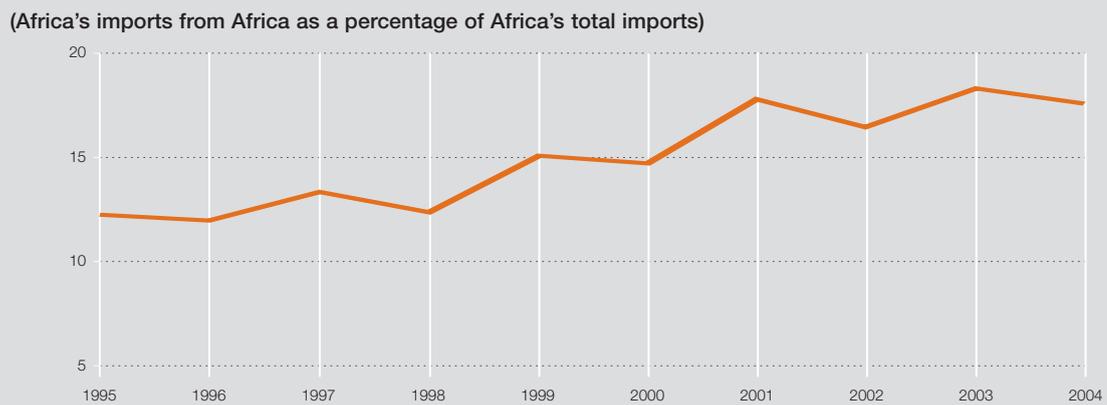
figure 9). The largest deficits are in grains, followed by oils and fats, dairy products and meat. Thus it seems that there is substantial potential to expand intra-African trade in agricultural and food products. Of course there are barriers that have to be overcome, including transport and handling costs, sanitary and phytosanitary issues, tariff and non-tariff barriers to trade, and market information problems. Lynam has argued that there are real possibilities and real challenges in developing profitable access for African smallholders to growing urban markets in Africa (private communication from John Lynam, Associate Director of the Rockefeller Foundation Food Security Programme).

Nevertheless, regional integration in agriculture has been slow. The ECA has shown that “there have been some strides in trade, communications, macroeconomic policy and transport. Some regional economic communities have made significant strides in trade liberalization and facilitation,... in free movements of people,... in infrastructure,... and in peace and security... Overall, however, there are substantial gaps between the goals and achievements of most

regional economic communities, particularly in greater internal trade, macroeconomic convergence, production, and physical connectivity.” (ECA, 2004, p. 1). Given AfDB’s desire to increase efforts in regional integration, this area seems to be a promising opportunity which deserves to be vigorously pursued.

Phytosanitary rules and regulations are steadily becoming more serious barriers for developing-country agricultural and agro-industrial exports. Their increasing stringency is driven by consumer demand factors, as well as by their potential to replace tariff barriers as a means of protection against imports (World Bank, 2005a). Developing countries have little choice but to insert themselves into the standard-setting processes and bodies and to build up their capacity to comply with these regulations (Ingco and Nash, 2004). Small countries are at a particular disadvantage because of the difficulties they encounter in providing the necessary services. Regional collaboration and integration will be necessary to enable compliance at an affordable cost. Support from AfDB would be highly desirable in this area also.

Figure 9 Trends in intra-African trade in agriculture



Source: FAO, 2006, based on WTO annual trade statistics.

## The ultimate source of growth: agricultural technology

Despite the enormous growth in human population and incomes, for more than 150 years agricultural commodity prices have followed a declining trend. This astonishing phenomenon has been caused by the combination of increasing international trade and sustained technical change in agriculture (Mundlak, 2001). These steady price declines indicate that eventually most, if not all, of the benefits derived from technical change in agriculture elude farmers and are transferred to consumers in the form of lower commodity prices (the famous agricultural treadmill). Evenson and Collin (2003) trace the presence of this phenomenon during the Green Revolution from 1996 to 2000. It is therefore not sufficient to improve the institutional environment and eliminate the barriers to profitability in low-income countries so that they may adopt the technology that is already available. In a global agricultural system, agricultural profits will go to those who are ahead of the curve in terms of implemented technology, human capital and institutions. Underperforming countries will need to produce a steady stream of new technology by strengthening and rebuilding their agricultural research and technology-adoption systems.

### The growing technology divide

Average grain yields were around 1 ton per hectare in the developing world around 1961 but had risen to nearly 3 tons per hectare by 2005. They increased to around 4.5 tons in East Asia and the Pacific and to around 2.3 tons in the Middle East and North Africa, while they stagnated at around 1 ton in sub-Saharan Africa. (World Bank 2007b, *World Development Report 2008*, figure 2.1). In 2000, improved varieties were being used in 84 per cent of the land area sown with grain in East Asia and the Pacific, 61 per cent in the Middle

East and North Africa and in Latin America and the Caribbean, but were being cultivated in only 22 per cent of the grain-growing land area in Africa. In 2002, fertilizer consumption had reached a staggering 190 kg per hectare of arable land and permanent cropland in East Asia and the Pacific, 73 kg in the Middle East and North Africa, but only 13 kg in sub-Saharan Africa. As a consequence, even the penetration of high-yielding varieties has led to no more than very limited yield gains in sub-Saharan Africa.

The reader will recall that African agriculture is characterized by a multitude of diverse farming systems, heterogeneity within farming systems (rather than dominance by one or two crops), the presence of many endemic plant and animal diseases, weathered low-fertility soils and erratic rainfall. In terms of its resource endowments and production mixes, African agriculture differs more sharply from the developed world than other developing regions of the world (Pardey et al., 2006), and this situation limits Africa's ability to benefit from intercontinental or subregional technology transfer and spillovers from scientific and other research results. These facts tell us that sub-Saharan Africa requires a greater scientific and adaptive research effort than other regions.

In 2000, global agricultural R&D spending amounted to US\$36.3 billion, of which 37 per cent was conducted by the private sector, while 63 per cent, or about US\$23 billion, was conducted by public entities. In all, 93 per cent of private research was conducted in developed countries (Pardey et al., 2006). On the other hand, public agricultural R&D grew faster in the developing world and is increasingly concentrated in China, India and Brazil. In stark contrast, public agricultural research in sub-Saharan Africa grew by only about 1 per cent per annum in the 1990s, and in 2000 totalled around US\$1.6 billion. Sub-Saharan Africa has the smallest share of private agricultural R&D spending in the world (only 1.7 per cent of its already low public

spending levels). Of total agricultural research spending, donors provide about 40 per cent and, in some countries, this figure rises to 60 per cent. Only five African countries – Botswana, Ethiopia, Mauritius, Nigeria and South Africa – are paying the recurrent budget of their national agricultural research services out of national sources.

“Collectively these data point to a disturbing development: a growing divide regarding the conduct of (agricultural) R&D and, most likely, a consequent growing technological divide in agriculture... The measures also underscore the need... to raise current amounts of funding for agricultural R&D while also developing the policy and infrastructure needed to accelerate the rate of knowledge creation and accumulation in the developing world over the long haul” (ibid., p. 68).

### **The changing nature of technology discovery**

All around the world, innovation is shifting away from a linear pattern that starts with scientific discovery and moves successively to technology development, adaptation to local conditions and dissemination to farmers. In its place comes a broader and more circular paradigm. It is broader in the sense that innovations are no longer concentrated in basic foods or industrial agricultural outputs but instead include the entire value chain, which extends from farm production, natural resource management, assembly, processing, marketing and retail to consumers. Driven by consumer demand changes, attributes of appearance, convenience, nature of the production process (organic, environmentally friendly, genetic and location origin) are assuming importance; this is particularly marked in developed countries, but is also increasingly apparent in middle- and low-income countries. Advances in information and communications technology have transformed countries’ ability to take advantage of knowledge developed in other places or for other purposes. Within this broader paradigm, private R&D play an increasing role. This is facilitated by the

development of broader intellectual property rights in agricultural technology. This provides many promising opportunities, but it also generates high levels of anxiety about the possibility of exclusion and high transaction costs for developing-country agricultural innovation. A number of larger developing countries are taking advantage of opportunities for greater private-sector involvement, including, most recently, India, which now boasts over a hundred private domestic and multinational seed companies. The private seed sector is also expanding in Africa, with Kenya being perhaps the most advanced. The latest major change is the emergence of biotechnology, which we have already discussed in section 3.

### **The African institutional framework for agricultural technology generation**

Sub-Saharan Africa has over 400 public and private entities engaged in agricultural research; nearly 200 of these organizations are public research institutions and another 200 are universities (compared to 20 in 1960). However, 40 per cent of them have fewer than five researchers, and 93 per cent have fewer than 50 full-time researchers (Beintema and Stads, 2004). Sub-Saharan Africa has nearly 50 per cent more agricultural scientists than India and about a third more than the United States, but all of sub-Saharan Africa spends only about half of what India spends and less than a quarter of what the United States spends. Only a quarter of African scientists have a PhD, compared with all or most scientists in India and the United States.

All institutions engaged in research within each country are collectively aggregated into “national agricultural research systems”. In the different subregions of Africa, these research systems have created subregional organizations. The strongest such organizations are the West and Central African Council for Agricultural Research and Development (CORAF/WECARD) and the Association for Strengthening Agricultural Research

in Eastern and Central Africa (ASARECA). The subregional organization for southern Africa is the Southern African Development Committee (SADC) Food, Agriculture and Natural Resources Directorate (SADC/FANR). A subregional organization for North Africa, which would initially comprise Algeria, the Libyan Arab Jamahiriya, Morocco and Tunisia, is also under development. These subregional organizations foster research collaboration in their subregions. ASARECA and CORAF/WECARD have established research grant funding mechanisms of their own, with significant support from the European Union. In 2001 the three subregional organizations that focus on sub-Saharan Africa established the Forum for Agricultural Research in Africa (FARA), which has its secretariat at the regional FAO office in Ghana. FARA has been entrusted by the African Union and NEPAD with the task of coordinating Pillar 4 of CAADP, which focuses on agricultural research and technology dissemination.

In order to strengthen biotechnology research, four regional bioscience network initiatives have been established under the auspices of NEPAD. The Biosciences Eastern and Central Africa Network (BecANet) facility was established in 2004. BecANet consists of a secretariat and service hub located on the campus of the International Livestock Research Institute (ILRI) in Nairobi, Kenya, and is envisaged as providing a common biosciences research platform, research-related services, capacity-building and training opportunities, regional nodes, and other laboratories distributed throughout Eastern and Central Africa for research on priority issues affecting Africa's development. In addition NEPAD has initiated three other African biosciences initiatives involving networks of leading centres and additional hubs and nodes in Northern, Southern and Western Africa: the Southern African Network for Biosciences (SANBio) with its hub at the Council for Scientific and Industrial Research (CSIR) in Pretoria, South

Africa; the West African Biosciences Network (WABNet), with its hub at the Institut Senegalais de Recherches Agricoles [Senegalese Institute of Agricultural Research] (ISRA) in Dakar, Senegal; and the Northern Africa Biosciences Network (NABNet), with its hub at the National Research Centre (NRC) in Cairo, Egypt. These hubs possess the necessary physical infrastructure to develop and implement regional and continental biosciences projects and are working to strengthen their project infrastructure further (NEPAD, 2007).

In the early 2000s, a public-private partnership to foster access to proprietary research was created with funding from the Rockefeller Foundation. The African Agricultural Technology Foundation (AATF) is an international not-for-profit organization designed to facilitate and promote public-private partnerships for access and delivery of proprietary technologies that meet the needs of resource-poor smallholder farmers in sub-Saharan Africa. Through a catalytic and facilitative role, AATF tries to serve as an honest broker between owners or holders of proprietary technologies and those who need them to promote food security and improve livelihoods for smallholder farmers in sub-Saharan Africa. AATF was incorporated in the United Kingdom in January 2003 and in Kenya in April 2003.

The Consultative Group on International Agricultural Research (CGIAR) supports the research of 15 international centres, 13 of which are located in developing countries. As of 2006, CGIAR consisted of 1,115 internationally recruited scientists and a total staff of 8,154 persons working in over 100 countries. A strategic component of the system is the ex-situ germplasm collections of 11 of its International Agricultural Research Centers (IARCs). Building on earlier independent initiatives, since the early 1990s CGIAR has rapidly broadened its focus from crop genetic improvement to include natural resource management, environmental issues and policy research.

In 2006, around US\$220 million, or 48 per cent, of total CGIAR expenditures of US\$458 million went to sub-Saharan Africa. The reader should note that this is only about 10 per cent of total research spending in sub-Saharan Africa. Africa also benefited from the 9 per cent share of CGIAR expenditures that went to North Africa and Central and West Asia. All of the IARCs currently have programmes in sub-Saharan Africa. Two of them are located in West Africa (the International Institute of Tropical Agriculture [IITA] and the Africa Rice Center [WARDA]) while another two are in Eastern Africa (the International Livestock Research Institute [ILRI] and the World Agroforestry Centre [ICRAF]). There are a total of 162 CGIAR IARC programmes and projects in sub-Saharan Africa. To implement these programmes and projects, the IARCs engage a total of 389 internationally recruited staff, 121 regionally recruited staff and 2,607 local staff. Nonetheless, as discussed previously, CGIAR spends less than 10 per cent of its overall resources on biotechnology research, and little of that is likely to be spent in or for Africa. CGIAR is not the only set of advanced research institutes operating in or for Africa, however. France's *Centre de coopération internationale en recherche agronomique pour le développement (CIRAD)*, and the *Institut de recherche pour le développement (IRD)*, formerly the *Office de la recherche scientifique et technique outre-mer (ORSTOM)*, also have operations on the continent. The combined budgets of these two institutes are as large as the entire CGIAR budget (NEPAD, 2007).

CGIAR research has made significant contributions to sub-Saharan African agriculture. Many previous studies highlight success stories such as high-yielding cassava varieties endowed with resistance to mites, mealy bugs and cassava bacterial blight, as well as tolerance to drought, low cyanogens potential, and good cooking quality; the now famous biological pest control capacities achieved in cassava and other crops;

biological pest control capacities in potato crops via pest resistant cultivars and other mechanisms; improved hybrids and open-pollinated varieties of maize in Western, Eastern and Southern Africa; higher-yielding wheat in Eastern and Southern Africa; hybrid sorghum in the Sudan; semi-dwarf rice for irrigated regions in West Africa; early maturing cowpeas in West Africa; and disease-resistant potatoes in the Eastern and Central African highlands.

### Returns to agricultural research

The adoption of new crop varieties in Africa has been significant. In the late 1990s, the adoption rate of improved varieties of all crops was equivalent to 22 per cent of the total area planted, and of this 11 per cent was planted with CGIAR-related varieties, most of which had been produced in collaboration with national agricultural research services (Pardey et al., 2006, table 6). In Eastern, Central and Southern Africa, 10 million farmers are reported to be planting and consuming improved varieties of beans.

Alston et al. (2000) assembled more than 1,500 rate-of-return estimates for agricultural research and extension (see table 2). The median estimates were 48 per cent per year for research, 62.9 per cent for extension studies, 37.0 per cent for joint research and extension studies, and 44.3 per cent for all studies combined. Table 2 shows that the median return in the developing world is about the same as in the developed world and that the median rate of return in Africa is slightly lower than elsewhere, but still very high at 34 per cent.

Evenson and Rosegrant (2003) estimates CGIAR contributions to yield gains derived from CGIAR research in sub-Saharan Africa to be in the range of 0.11-0.13 per cent per year. This range is much smaller than the 0.30-0.33 per cent per year average yield gain registered across all developing regions (ibid.). Despite the introduction of new varieties on a substantial

Table 2 Estimated rates of return to investment in agricultural research

(United States dollars per ton)

Region	Number of estimates	Median rate of return
Africa	188	34
Asia	222	50
Latin America	262	43
Middle East/North Africa	11	36
All developing countries	683	43
All developed countries	990	463

Source: Alston et al. (2000)

scale, there has not been a strong aggregate impact on yields compared with other regions, partly because of the much lower adoption rates and partly because of a lack of irrigation and of fertilizers and inappropriate policies.

### The most urgent need for action

The upshot of the discussion about returns is that the under-investment in agricultural research in Africa is not warranted either by low returns or low adoption rates. FARA has developed the Framework for African Agricultural Productivity (FARA, 2006), which sets out guiding principles for how research is to be fostered, institutionalized and financed in Africa. Under FAAP, FARA, subregional organizations and national agricultural research services will collectively guide the development and reform of agricultural institutions and services, foster an increase in the scale of Africa's agricultural productivity investments, and help align and coordinate financial support.

A joint donor evaluation described FARA and its programmes as follows: "FARA is a young organization...it has developed a strong organizational framework in its first three years of full existence... The Secretariat has demonstrated that it is both efficient and effective in its

operations with increasingly significant tasks being assigned to the FARA Secretariat and the various FARA constituencies, these... now urgently need to increase their human resource capacity... JEE believes that the FAAP provides a framework for harmonising donor support, and that committing to consolidated funding of the FARA Rolling Work Programme & Business Plan [RWPBP] is the best means of pooling resources." (DFID Joint External Evaluation report, 2007, p. 11).

Despite these favourable developments and external assessments, the work programmes of FARA, of subregional organizations and of national agricultural research services remain seriously underfunded. Fortunately, AfDB has recently approved a US\$25 million programme in support of FARA, and both AfDB and IFAD are funding agricultural research via various channels. Nevertheless, more finance for agricultural research at all levels by both institutions is warranted.

### Agricultural science and education institutions

"Africa now houses roughly 300 universities. Three-quarters of African countries offer some tertiary level training in agricultural sciences. At least 96 public universities teach agriculture and natural resources management. Of these, 26 are in

Nigeria, ten in South Africa, six in Sudan, five in Kenya and three in Ghana. Nineteen separate faculties of veterinary science exist in 13 countries, five of them in Nigeria alone" (Johanson and Saint, p. 15). Despite the existence of these many facilities, agricultural aid funding "...has dropped precipitously. ...agriculture received a diminishing portion of a shrinking development assistance pie..." (ibid., p. 16). Country expenditure has paralleled the drop in donor assistance. The outcome is a proliferation of institutions which have limited staff and virtually no research support money. The sad part is that, now that the need for agricultural technology development has regained a high priority for Africa, the continent is left with a deteriorating, oversized and fragmented infrastructure, many vacant positions, an aging staff, outdated equipment and no operating funds.

Johanson and Saint's conclusion is poignant: "Agricultural education and training has been demonstrated to be a vital, but much neglected, component of agricultural development in Africa. It is under-valued, under-resourced and under-provided. Human capital in agriculture has been depleted by long neglect." (p. 67). The InterAcademy Council study states "... It is the conviction of this Study Panel that much of what would be necessary to improve agricultural productivity and food security in Africa hinges on strengthening agricultural educational systems, more specifically the coverage and quality of higher education." (IAC, 2005, p. 184).

However, there are hopeful signs. "Seven American foundations have formed the Partnership for Higher Education in Africa and pledged to invest at least USD\$ 200 million over the next five years...and ...the Gates and Rockefeller Foundations recently formed a separate partnership, called the Alliance for a Green Revolution in Africa (AGRA)". (ibid.) In addition, United Nations Development Programme (UNDP) is supporting a community

of practice called Sustainability, Education and Management of Change in Africa (SEMCA) which is focusing on agricultural education.

### **In conclusion**

It is clear that African regional and national institutions for agricultural science, technology and agricultural science education have started to respond to the enormous scientific and technological challenges faced by Africa. The challenges are intensified by increasing competition for resources, climate change and rising international agricultural prices. These responses are being mounted within the framework of a rapidly changing global research system that encompasses biotechnology, intellectual property rights and patent systems, and a growing range of players, especially the private sector. The significant institutional responses that have been forthcoming have so far not been matched by adequate funding from international donors or national governments, especially in the areas of biotechnology and science education. While AfDB and IFAD are contributing financing at regional, subregional, national and project levels, it is clear that they, as well as other organizations, will need to step up their contributions.

### **The imperative of regionalization**

This paper has discussed many different critical issues that can best be, or can only be, solved by regional action, and more are yet to come. A sampling of those issues would include the following:

- I many of the large number of small countries in Africa lack the financial capacity for public goods investments;
- I small landlocked countries are generally worse off and depend on regional integration in order to improve their lot;

- I expanded regional trade in agriculture and food products is good for growth, farmers' incomes and regional food security; the short-run management challenges posed by the current food price spike and the long-run opportunities arising from the fact that prices are expected to settle at higher levels only add to this imperative;
- I expanded regional trade and food security will be enhanced by the harmonization of standards and sanitary measures and by the use of subregional and regional capacities to implement them;
- I freer borders and improved internal infrastructure should encourage private-sector traders;
- I for small countries, regional infrastructure (roads, communications, ports) is critical for access to each other and to external markets;
- I reversing land degradation and desertification and preserving biodiversity call for transboundary collective action;
- I management of crucial, but threatened, forestry and fisheries resources must be approached on a transnational basis;
- I defence against epidemics of plant and animal diseases require collective responses at subregional and regional levels;
- I success in agriculture crucially depends on indigenous scientific capacity's generation of new technology. Given the existence of so many small and poor countries, it is far better to undertake this task on a regional or subregional basis. FARA and subregional organizations are on the right track, but the effort needs to be greatly expanded;
- I since biotechnology research is expensive and requires a large critical mass, the work of two or three regional institutes in this area would be far superior to that of 24 or 48 underfunded, under-resourced national institutions;

- I since building indigenous scientific capacity requires trained people, this is another task that should be assigned to regional institutions which have the critical mass and necessary financial support; and
- I regional approaches to improvements in rural financial architecture may increase potential deposits and loanable funds and can help to spread risk.

It is hoped that these examples will suffice to illustrate the fact that the potential for regional approaches and an overall regional strategy for rural Africa are significant. Yet, in almost all of these areas, institutional development programmes remain massively underfunded. The main reason for this is that regional efforts produce regional and subregional public goods, and their financing is therefore subject to the familiar free-rider problem. Except for the largest countries, which have an incentive to supply themselves with these regional public goods, countries will seek to benefit from the investment of others. It is precisely here that a regional development finance institution such as AfDB has a major opportunity to step in, as it can both coordinate and contribute to the financing of these essential regional capacities.

While there is probably less of a role for IFAD in this area, it is already playing an active role by hosting the Global Mechanism of the United Nations Convention to Combat Desertification. AfDB has fully recognized this comparative advantage in general terms, and it can become much more active in supporting cross-border agricultural collaboration. To effectively exercise a leadership role, it needs to develop the relevant analytical and implementation capacity, along with streamlining finance mechanisms that are not dependent on individual country borrowing decisions.



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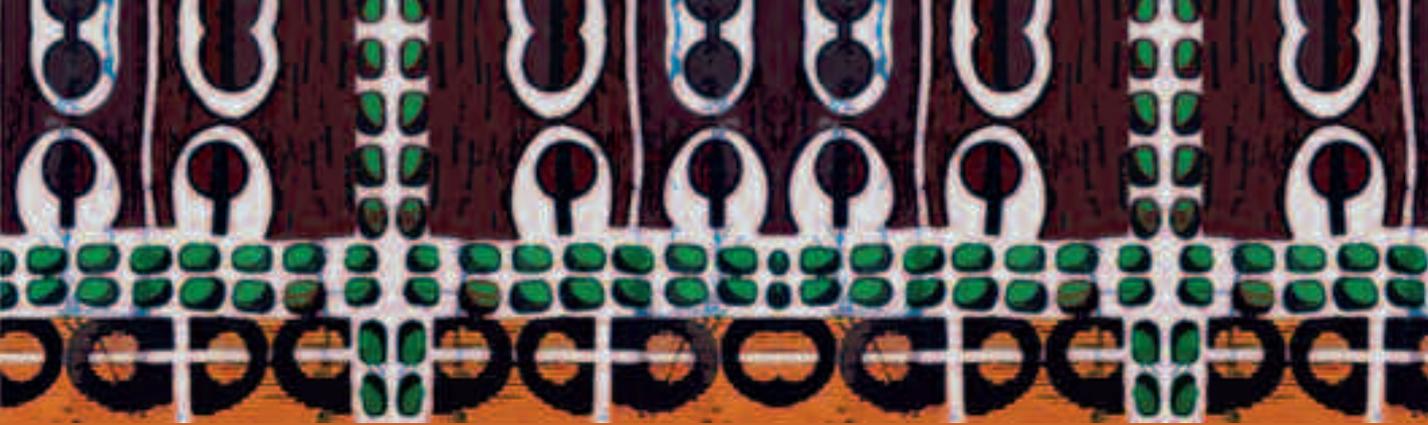
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