Agriculture for Development in Sub-Saharan Africa: An Update

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Abstract

Agriculture has multiple functions to fulfill for the development of the Sub-Saharan Africa countries: a source of growth, an instrument for poverty reduction, and a contribution to the provision of environmental services. Yet, it is still used far below potential, with gains in land and labor productivity lagging below those of other regions. Successful use of agriculture for development will require greater attention by governments and donors, supported by scholarship and learning. The economics profession has an important role to play in helping re-conceptualize in a new paradigm the role of agriculture for development, design and evaluate new approaches, contribute to capacity building, and participate to policy advice and the mobilization of political support.

1. Toward a new paradigm in using agriculture for development in the "agriculture-based" countries

The agriculture-based countries have, by definition, a high share of total poverty in the rural sector and a high share of GDP growth originating in agriculture, the latter fundamentally because agriculture accounts for a large share of their GDPs. They include all the SS-Africa countries else than South Africa as a transforming country and some mineral-rich countries. The current role of agriculture in the development of these countries is not only in support of industrialization—as in the well known dual economy models and the classical models of "agriculture on the road to industrialization" (Mellor, 1998) and "agricultural-demand-led industrialization" (Adelman, 1978)—and for economic diversification away from agriculture (following the regularities of the structural transformation with a declining share of agriculture in GDP and in the labor force). Instead, in the emerging paradigm espoused in the *WDR 2008*, agriculture has multiple functions for the development of these countries in helping trigger overall economic growth at early stages, reduce poverty, increase food security, equalize gender status, reduce rural-urban income disparities, conserve resources, and provide environmental services (Byerlee, de Janvry, and Sadoulet, 2009). These multiple functions can be win-win, but more generally imply trade-offs and the consequent need for country-level priority setting in deciding how to effectively use agriculture for development. How to use agriculture for development should consequently be an important component—though frequently neglected—of Poverty Reduction Strategy Papers and other national planning exercises.

Claim 1: Using the multiple functions of agriculture for the development of the agriculture-based Sub-Saharan Africa countries offers an important option that should not be missed. How to do this must be designed in priority-setting exercises conducted at the country level.

2. Inconvenient facts about the comparative performance of Sub-Saharan Africa

Agricultural growth in Sub-Saharan Africa has been lagging relative to other regions of the world, especially in value added per capita. The latter has stopped declining since 1994 but remains sluggish in a comparative perspective. Area expansion has been the main source of output growth in cereal production in Sub-Saharan Africa, by contrast to East and South Asia where rising yields were the main source of growth, and to Latin America where area expansion that was initially the main source of growth has also given way to rising yields (Figure 1). However, more than in most other parts of the world, rising land scarcity has become a stark reality for Sub-Saharan Africa, compromising reliance on area expansion as a future source of growth, and calling for emulation of the Latin American growth reversal. Arable land per agricultural worker has been falling steadily in most countries. Yet, cereal yields have been overall stagnant while those in other regions have increased steadily (Figure 2), with some better performers such as South Africa, Côte d'Ivoire, and Zambia showing the way forward. Accelerated growth thus requires, and will increasingly require, gains in land productivity that have to this date not materialized at an aggregate level, i.e., it needs a "Green Revolution" for Africa. In the context of climate change, more resilient yields to extreme climatic events will also be an important feature of this Green Revolution.

Two important reasons for lack of progress in land productivity are continued low adoption of chemical fertilizers (Figure 3) and lack of expansion of area under irrigation. While increased use of chemical fertilizers may create environmental concerns at high levels of use (272 kg/ha of arable land in East Asia, 148 kg/ha in high income countries, and 131 kg/ha in South Asia), this should not yet be a concern in Sub-Saharan Africa with only 11 kg/ha. There has also been lack of progress in labor productivity in agriculture, when labor productivity gains are essential for poverty reduction in the farming population.

While there has been intense displacement of the labor force out of agriculture, this has in most cases not been associated with growth in GDP per capita, resulting in truncated structural transformations compared to normal patterns of growth as observed cross-sectionally and in East and South Asia (Figure 4). Nigeria, Côte d'Ivoire, Cameroon, and South Africa are illustrative of large scale labor displacements out of agriculture without GDP per capita growth. China shows the opposite pattern with rapid GDP per capita growth but delayed official transfers of labor out of agriculture.

As a consequence, rural poverty has been persistent, with an actual absolute increase in the number of rural poor, and African 70% of the poor remaining rural. Largely because they have been too slow relative to population growth, land and labor productivity gains in the recent period have not been associated with a reduction in rural poverty, again compared to what productivity growth has achieved in South Asia and especially East Asia.

Claim 2: Agriculture in Sub-Saharan Africa is used far below potential, with gains in land and labor productivity lagging below those of other regions. Releasing pent-up productivity growth in agriculture offers a major opportunity for development that is still to be captured.

3. Recent evolution and combined crises

The food crisis with higher and more volatile international market prices is particularly threatening to Sub-Saharan Africa where most countries are net food importers and where most of the population spends a high share of its income on food staples. Propagation of the global food crisis to the national level is however far from straightforward. The transmission from international to domestic prices has been highly uneven across countries and commodities, ranging from high transmission for rice in Senegal to low transmission in most other countries such as Madagascar (Daviron et al., 2008) and Malawi (Figure 5). Higher transmission for a particular commodity tends to be associated with greater import dependency and lower diversification in consumption, but the determinants of transmission are also highly idiosyncratic to countries depending on policy interventions, real exchange movements, transactions costs on markets, and the competitive structure in imports and processing. Frequently assumed full transmission has led to overblown predictions of impact.

There is a price policy dilemma originating in the contrast between: (1) more stable consumer prices for imported foods (such as rice in Mali and Senegal as seen in Figure 6) with eventual world price shocks as in the 2007-08 food crisis where there is high transmission as in Senegal, and (2) prices disconnected from the international market for local cereals (with little transmission through substitutions in consumption) but with very high and visibly rising variability, such as millet in Mali and Senegal (Daviron et al., 2008).

The food situation for the world, and especially for Sub-Saharan Africa, has changed drastically in the last five years (Abbott, 2009). New pressures have emerged both on the demand side associated with continued rapid population growth, income effects, and demand for biofuels, and on the supply side originating in fluctuating energy prices, climate change, water scarcity, soil depletion, and pandemic zoonotic diseases. With rising international market prices signaling that supply is overall not keeping up with demand, rising price volatility in a context of low international grain stocks, defensive trade policies, and speculative movements on commodity markets, much greater focus needs to be placed on the supply side of food, and in particular on achieving sustainable productivity gains and greater resilience to shocks.

Dealing with international market price volatility and domestic yield instability raises anew the issue of food security as a major policy concern, when it had slipped off the policy agenda following structural adjustment and trade liberalization. This requires revising policy decisions regarding trade when international market prices for staple foods are more volatile, use of national food reserves (Wright, 2009), social safety nets for the vulnerable, supply response in agriculture for greater domestic self-sufficiency,

and promotion of subsistence farming for "farm-financed social welfare" (Owen, 1966) for those beyond the reach of social safety nets when exposed to shocks.

Securing access to food thus requires focusing not only on chronic poverty but also on vulnerability to transitory poverty, with a need to adjust current social assistance programs that are better equipped to deal with the former than with the latter. Assessment of the welfare incidence of price changes needs careful identification of net sellers and net buyers among rural households, most often revealing the surprising fact that a large majority of landed households are in fact net buyers of food, and thus negatively affected by higher and more volatile prices (de Janvry and Sadoulet, 2009).

Claim 3: There is both increased urgency and rising difficulty in using agriculture for development. Changing conditions imply that greater attention needs to be given to the supply side of agriculture that has been neglected in the last 25 years of declining prices. Food security strategies also need to be given renewed attention using a broad spectrum of instruments that include increased productivity gains in agriculture, combined trade and food reserves policies, social safety nets for the vulnerable, and reliance on subsistence farming for net-buyer smallholders not covered by formal social safety nets.

4. The continued neglect of agriculture

In spite of greater public concern with agriculture created by the food crisis, the resilience of rural poverty, and the contributions of agriculture to climate change, public budgets allocated to agriculture in Sub-Saharan Africa still fall short of the 10% NEPAD guideline and of the 15% allocated to agriculture by successful Asian countries. Similarly, overseas development assistance allocated to agriculture in SS-Africa remains at historically low levels with only modest improvements after 2006. There is also continued under-investment in agricultural research when comparing rates of return on investment to the opportunity cost of capital shows that there are high pay-offs from such investments.

The neglect of agriculture is also apparent in structural adjustment programs that have been highly detrimental to the institutional infrastructure of agriculture, followed by highly incomplete reconstruction of an alternative institutional structure. This includes market facilities, financial services, property rights, producer organizations, and governance for agriculture. An improved performance of agriculture clearly depends on greater attention to the institutions that serve the sector. Most important among those is the redesign of Ministries of Agriculture so they can not only support agriculture growth, but also make agriculture a effective instrument for development. This essential institutional reconstruction is still largely missing.

While reversing the neglect of agriculture requires increased public expenditures and overseas development assistance to agriculture, the financial crisis is likely to make commitments to agriculture by governments and international donors more difficult to be met. Greater emphasis must consequently be directed at improving the quality of public expenditures and of foreign assistance to agriculture, an area with considerable room for

improvement. There are also encouraging new initiatives in progress including the CAADP policy guidelines, a more pro-active role for GFAR, increased budgets for the CGIAR, successful disbursements under the World Bank's Global Food Crisis Response Program, and the Gates-Rockefeller Foundations' AGRA initiative. These initiatives need to be supported by high quality monitoring and impact evaluations for guidance and improvement, a support still largely incipient.

Because Sub-Saharan Africa's agriculture is highly diverse, priority setting in allocating additional funding to agriculture requires local consultations. Diversity can be appreciated in considering the large number of starchy staple foods that contribute to consumers' calorie consumption: 21% from maize, 18% from cassava, 13% from rice, 12% from millet, 10% from wheat, 10% from other roots and tubers, 9% from sorghum, and 3% from other cereals. This diversity poses a major challenge in priority setting as there are large economies of scale in research and development, as well as in specialized marketing services. While diversity calls on local priority setting, economies of scale require coordination at a higher geographical level. Combining local delivery of improved varieties with economies of scale in generation is a major institutional challenge to a Green Revolution in Sub-Saharan Africa.

Claim 4: The continued under-performance of agriculture is due to policy neglect and insufficient attention by donors that can all be reversed.

5. Toward a productivity revolution in smallholder farming

One of the reasons for poor past performance of public investments in agriculture has been insufficient recognition of the difficulty in doing so. There should be no illusion that successfully using agriculture for development is a complex and multi-pronged enterprise that requires conceptualization, resources, capacity, coordination, political commitment, and time. Short run impacts on poverty are easier and faster to achieve via transfers (that have often been made conditional on behavior toward child education and health), explaining the rising popularity of transfers as opposed to rising autonomous incomes as instruments, but they cannot be sufficient and adequate to solve the rural poverty problem. Rising autonomous incomes for the rural population has to be the main focus of sustainable poverty reduction strategies.

Rainfed agriculture, that accounts for 88% of Sub-Saharan Africa's cultivated area, is characterized by a high degree of heterogeneity of conditions (highly varied agro-ecological environments, multiplicity of crops and farming systems, and differential exposures to risks). Managing this heterogeneity requires decentralization and participation in order to design and implement local solutions. Heterogeneity also originates in highly varied social systems with a great diversity of institutional arrangements. Multiple constraints require a multisectoral approach. Key issues to be addressed include exhausted soils, insufficient infrastructure (roads, water), low levels of education and health, a private sector limited by an uninviting investment climate, incipient producer organizations, and weak governance for agriculture. Small countries

and large economies of scale in such investments as R&D and infrastructure invite regional cooperation.

In using agriculture for development, the process through which growth in agriculture is obtained is as important as the outcome, in particular to achieve poverty reduction, gender equality, and environmental sustainability. Smallholder farming must for this reason be the dominant approach in spite of some advantages associated with large scale farming and the contracting out of land to international agribusiness that has recently been advocated by some development economists and pursued by some governments (Collier, 2009).

The challenges of a productivity revolution in smallholder farming in Sub-Saharan Africa are daunting, yet need to confronted, and there are good signs that success can be achieved. There are basically six aspects to this challenge:

- First, it must succeed where it has failed before, and success must be **rapid** to avoid major human disasters. Old recipes will consequently not work. Innovations have to be part of the solution.
- Second, it must be **specific** to the conditions of Sub-Saharan Africa characterized by a great degree of heterogeneity and weak broader supporting conditions in terms of markets, institutions, and public goods, thus requiring participatory multi-pronged approaches, that can be designed as integrated territorial approaches (as explored for example in the Millennium Development Villages). Territorial approaches are also important to help coordinate agriculture with a broad array of rural non-farm activities that can offer expanding income opportunities to the local population.
- Third, it must deal with the challenges of **sustainability** and environmental friendliness that were not concerns in the original Green Revolution in Asia (viz. the environmental consequences in the Indian breadbaskets with extensive chemical pollution, depletion of aquifers, and loss of biodiversity). The classical seed-fertilizer-water package will not suffice and needs to be complemented by environmentally sustainable approaches such as agro-ecology and conservation agriculture.
- Fourth, it must go **beyond cereals** to include high value activities -- fruits and vegetables, livestock, fish, and some forest products -- and provide opportunities to link to integrated value chains for high value products in catering to non-traditional exports and supermarkets.
- Fifth, it must address brand **new challenges** such as climate change (particularly vulnerability to climate shocks and risk management) and the forces of globalization (particularly volatile prices and the rapidly changing demands of value chains).
- Sixth, it must redefine the **role of the state** in support of agriculture for development. This includes the issues of property rights over land that are still incomplete for security of access in many parts of the continent, use of "smart" subsidies to induce productivity change and cope with price shocks, public-private partnerships in the delivery of public goods and productive investments,

redesigned functions for ministries of agriculture, and an active role for civil society in participating to public affairs.

We see these challenges as being successfully addressed in large numbers of locations. The list of success stories is long and varied (see for example the World Bank's (2007) *Agriculture Investment Sourcebook*). It ranges from land certification schemes that provide security of access and support land rentals, to technological innovations in dealing with drought and flood resistance and with improved nutrition, more complete financial services that combine credit with savings and insurance, whole value chains approaches that bring smallholder farmers into contractual farming with agro-industry, commodity exchanges to improve domestic market performance and create links with international commodity markets (Gabre-Madhin, 2009), extension systems that more effectively cater to clienteles by using IT capacities, community-driven development schemes with local participation to the delivery of public goods (Binswanger, 2006), and producer organizations able to not only serve the business needs of their membership but also acquire voice in the definition of public policy. These success stories need to be better identified, understood, and scaled up so they become reflected in aggregate statistics. Opportunities exist for profitable investments in agriculture, as can be seen in impressive gains achieved in the production of non-traditional exports. And there is a clear renewal of interest in the private sector for the investment opportunities offered by agriculture.

Claim 5: Successful use of agriculture for development will require much greater attention to agriculture by governments and donors, supported by greater scholarship and learning. The economics profession has an important role to play in helping re-conceptualize in a new paradigm the role of agriculture for development, design and evaluate new approaches, contribute to capacity building, and participate to policy advice and the mobilization of political support.

6. Need for social science scholarship in support of agriculture for development

We cannot assume that we know the answers as to how to use agriculture for development in SS-Africa since a productivity revolution has to be idiosyncratic and locally adapted. Useful lessons can be derived from historical successes in other regions of the world and from widespread local achievements in Sub-Saharan Africa. There is a huge deficit of good social science scholarship applied to issues of agriculture for development in helping identify answers. For this reason, the objective of this volume is to explore research frontiers and priorities in six fields of importance in support of agriculture for development:

Access to assets and property rights (Klaus Deininger)
Technological change for smallholder agriculture (Aliou Diagne)
Institutional innovations for smallholder competitiveness (Willis Kosura)
Vulnerability and resilience in the context of shocks and crises (Marcel Fafchamps)

Smallholder participation to markets and value chains (Eleni Gabre-Madhin)
Collective action in support of smallholder competitiveness (Christopher Udry)

Claim 6: The objectives of this volume are to help assess the frontiers of the field and develop agendas for research in economics on how to better use agriculture for development. The potential for success exists. To yield results that can make a difference, this effort needs to be part of a broader sustained undertaking in learning to use agriculture for development.

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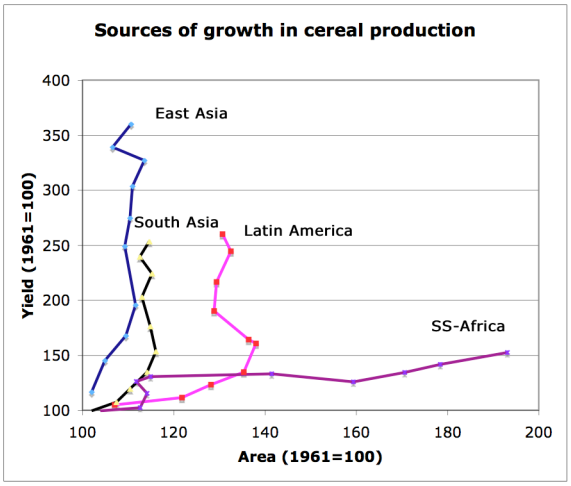

Figure 1. Sources of growth in cereal production: Area expansion and yield growth, 1961-2007

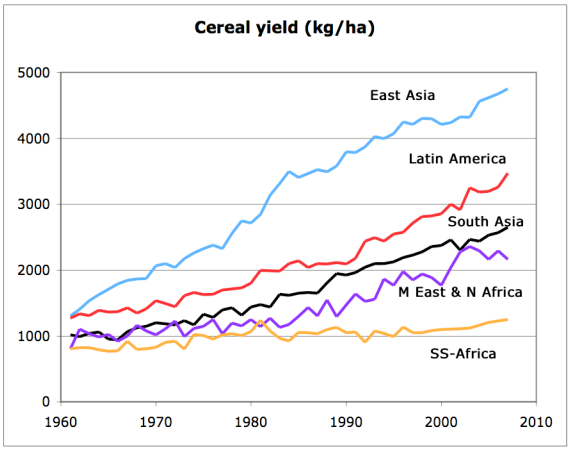

Figure 2. Land productivity in cereal production

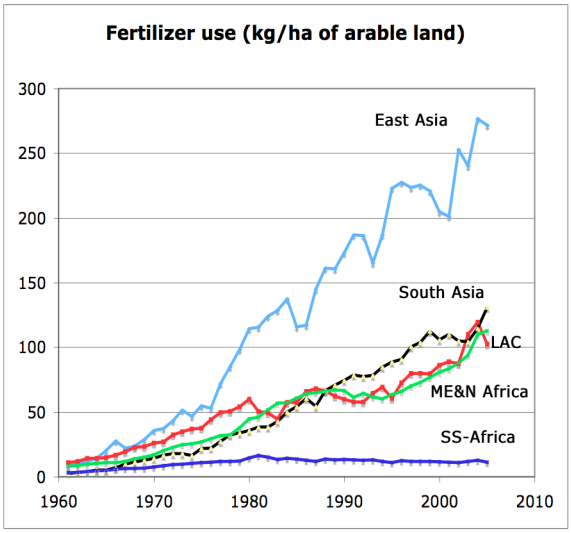

Figure 3. Fertilizer use in agriculture

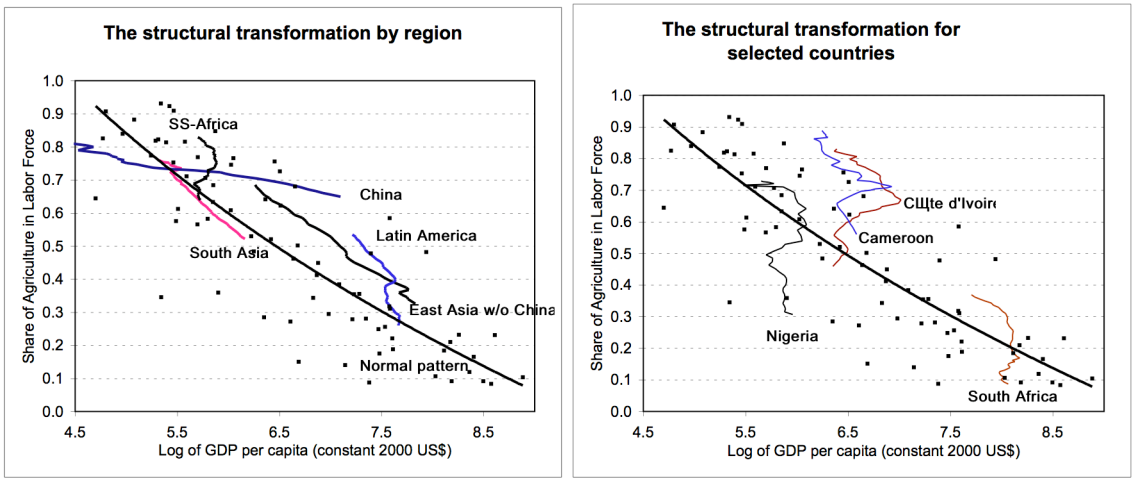

Figure 4. Structural transformation by region and in selected Sub-Saharan Africa countries

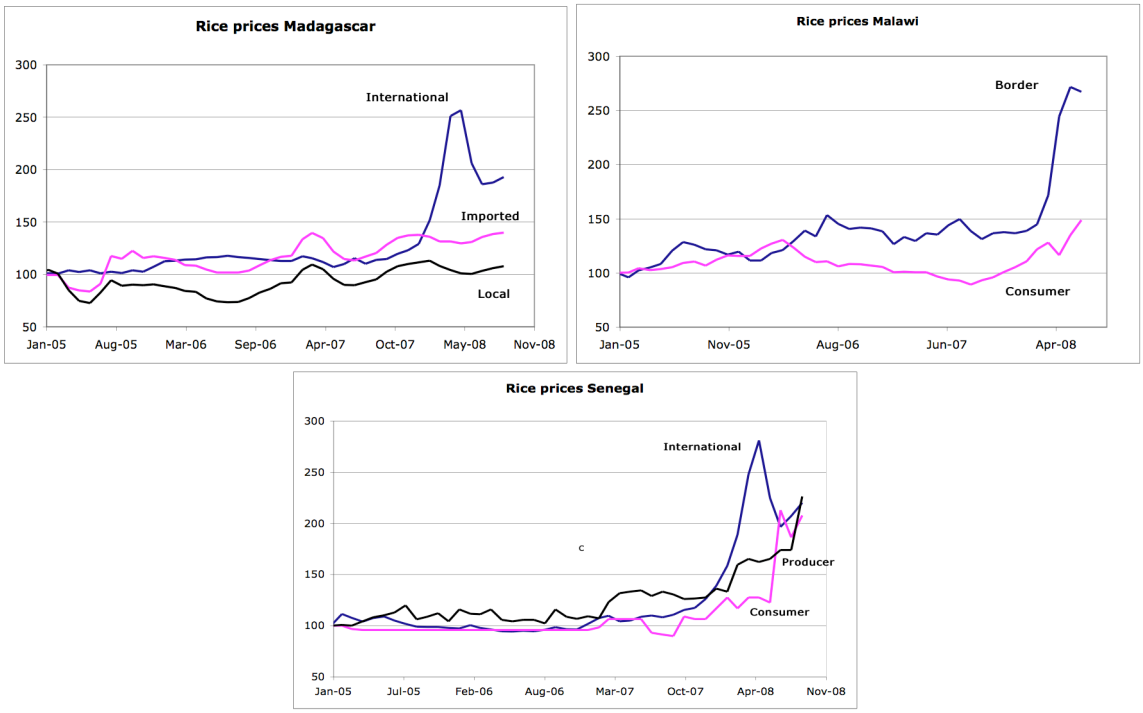

Figure 5. Price transmission for rice from international to domestic market

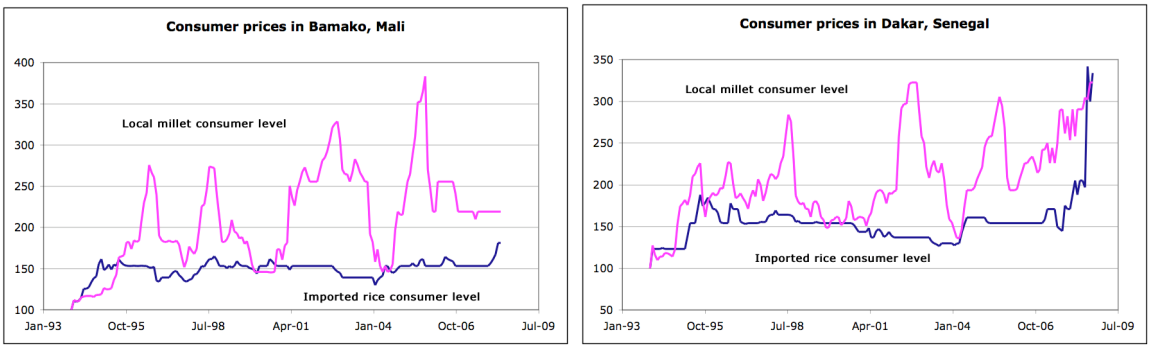

Figure 6. Consumer prices for imported rice and local millet in Mali and Senegal