Agriculture for development: new paradigm and options for success

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Abstract

The role of agriculture as an instrument for industrialization had been rigorously conceptualized in the 1960s and 1970s under the classical paradigm of development economics. After many implementation failures under import substitution industrialization policies and protracted neglect of agriculture under the policies of the Washington Consensus that followed the debt crisis, agriculture has gradually returned in the development agenda, especially with the food crisis. We argue in this article that a new paradigm has started to emerge as to how to use agriculture for development, pursuing a broadened development agenda. We explore the specifications of this paradigm and discuss conditions for successful implementation.

JEL classifications: B20, O13, Q18

Keywords: Agriculture; Industrialization; Development; Governance

1. Introduction

In the classical paradigm of development economics that prevailed in the 1960s, agricultural growth was held to be the key pillar for industrial growth, itself seen to be synonymous with economic development. The paradigm was anchored in compelling success stories, from the long history of the "Western Experience" to the then-recent "Asian miracles." And it was supported by rigorous modeling exercises. But, in spite of several successful cases, the implementation of this paradigm was running into increasing difficulty in the 1970s and early 1980s as policy favored import substitution industrialization with strong antiagriculture price policy biases. Integrated rural development strategies, designed to meet the broadened development objectives introduced in the 1970s that included poverty and inequality reduction, were also proving difficult to implement successfully, in part because of the low profitability of agriculture and in part because of excessively complex state-led approaches. With the debt crisis of 1982, and the subsequent implementation of stabilization and adjustment policies under the Washington Consensus, use of agriculture as an instrument for development was disregarded in favor of other approaches to development such as open economy industrialization to accelerate growth and cash transfers or workfare programs to reduce poverty. With a few notable exceptions such as China and Vietnam where smallholder-based agricultural growth was pursued vigorously, the economic, social, and environmental costs of this neglect of agriculture have been huge.

In recent years, a number of economic, social, and environmental crises have attracted renewed attention to agriculture as both a contributor to these problems and a potential instrument for solutions. This return

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to agriculture is happening in a context where development objectives have been significantly broadened and under contextual conditions to achieve agricultural growth that have changed markedly, implying that renewed attention to agriculture cannot be implemented by returning to the classical paradigm of development economics. A new paradigm has started to emerge where agriculture is seen as having the capacity to help achieve several of the major dimensions of development, most particularly accelerating GDP growth at early stages of development, reducing poverty and vulnerability, narrowing rural-urban income disparities, releasing scarce resources such as water and land for use by other sectors, and delivering a multiplicity of environmental services. Yet, renewed use of agriculture for development remains highly incomplete, falling short of political pronouncements. The underperformance of agriculture for development is associated in particular with continued under- and misinvestment in agriculture by most governments and international donors.

We propose in this article the interpretation that this gap in performance is due to two main causes: one is an inadequate reconceptualization of the role of agriculture for development to correspond to the new objectives and the new contexts; the other is an inadequate redesign of the approaches to ensure that agriculture effectively contributes to development. Reconceptualization would involve: (1) Formalizing the complementarities and trade-offs in the multiple functions that agriculture has for development in the emerging context, (2) designing the process whereby agricultural growth is achieved in order to attain the desired dimensions of development beyond those derived from the market-driven economic competitiveness of private agents, and (3) redefining the role of the state in setting social priorities among conflicting functions and in overcoming market failures for agriculture. Redesigning approaches for effective implementation would include: (1) Experimenting with new approaches to using agriculture for development, identifying the causes of success, and internalizing lessons for scaling up, (2) fixing the governance structure for agriculture to enable the state to achieve its new functions in using agriculture for development, and (3) committing, through institutional designs, the state and the international community to support the long-term role of agriculture for development above price and political cycles.

We argue that this can and must be done, but that success requires recognizing and confronting the substantial difficulties and exigencies of working with the new paradigm of agriculture for development, including the needs for greatly enhanced levels of resources, expertise, coordination, and sustained commitments. Given the current and predicted world conditions for food and agriculture, there is little choice but to meet the urgent imperative of succeeding with this effort.

2. From classical paradigm of agriculture for industrialization to contradictions and neglect

There has been a long and distinguished tradition in development economics and in the practice of development in focusing on the role of agriculture in development (Johnston and Mellor, 1961; Mellor, 1976).[1] In this classical development paradigm, strongly anchored in both history and theory, agricultural growth was seen as the engine of industrialization, structural transformation of the economy, and aggregate growth. The classical paradigm found its origins in the historical regularity linking industrial revolutions to prior agricultural revolutions in countries ranging from England in 1750 to Japan in 1880, the so-called "Western Experience" (Bairoch, 1973). It also found strong support in the then recent success stories of the "Asian miracles" (Taiwan, South Korea) anchored in redistributive land reforms and rapid productivity growth in smallholder farming. This role was conceptualized by the development profession in the 1960s in terms of the various contributions that agriculture can make to industrial development through the generation and transfer of an investible surplus and through the creation of effective demand for industry on the domestic market (Morrisson and Thorbecke, 1990). The surplus of agriculture could take various forms: labor released from agriculture through productivity growth allowing industrial employment (Ranis and Fei, 1961); lower food prices allowing lower nominal wages for industrial employers also as a consequence of technological

[1] The evolution of thought in economic development is very usefully presented in Thorbecke (2006).

change in agriculture (Lele and Mellor, 1981); foreign exchange earned by agricultural exports and available to the central bank to import capital goods and intermediate products for industry; and taxes levied on agriculture (in particular a land tax as in Japan) or forced savings on agriculture (through low-priced forced deliveries as in the Soviet Union and India), or "invisible transfers" (through managed low prices as in Latin America via exchange rate and trade distortions) that were invested in urban public goods and industry. Agriculture could also contribute through effective demand for nontradable industrial goods created by rising agricultural incomes, inducing an Agricultural Demand-Led Industrialization process (Adelman, 1984). Productivity growth in agriculture was thus seen to have strong growth multiplier effects on the rest of the economy through intersectoral and final demand linkages. The empirical regularity supporting this vision of "agriculture on the road to industrialization" (Mellor, 1998) was the structural transformation (Johnston and Kilby, 1975; Timmer, 1988). Along this transformation, derived from Engel's Law, which states that the share of food in consumer expenditures declines as income rises, the share of agriculture in both total employment and GDP declines as GDP per capita rises. The surplus, linkage, and market contributions of agriculture, and the associated multiplier effects, could accelerate growth in the rest of the economy above the rate of growth in agriculture, leading to a relative decline of the agricultural sector in employment and GDP. The role of agriculture in development was thus measured in its support to the acceleration of growth in the rest of the economy, principally industry, with the relative decline of agriculture a symptom of mission successfully accomplished.

The fact that rapid agricultural growth was possible was itself derived from the work of Schultz (1964) who had shown that, in spite of poverty because of lack of access to assets, smallholder agriculture is responsive to price incentives and prone to adopt remunerative technological change opportunities. Hence, "getting the prices right" matters for agriculture (Streeten, 1987), while a prolonged urban bias in the terms of trade for agriculture can have devastating economic costs (Lipton, 1977). It was also derived from the work of Hayami and Ruttan (1971) who showed the importance of total factor productivity gains as a source of growth for agriculture once land expansion had been exhausted, and how the resource-saving bias of technological innovations is responsive to the market signals about relative factor scarcity and to public-sector investment in agricultural research and extension. Following the lead of Griliches (1958), rates of return to investment in agricultural technology were measured to be typically far in excess of the opportunity cost of capital in public investment.

In the 1960s and 1970s, this classical paradigm had been successfully implemented in Asia where the Green Revolution both averted major famines and helped kickoff industrialization (Lipton, 1989). While these successes focused attention in academic circles on the potential merits of the classical paradigm, it was in fact not being put into practice in a way that could deliver strong results across the developing world, and especially to Sub-Saharan Africa (Dumont, 1962). There was in particular an underemphasis on the role of the private sector in the rapidly emerging agribusiness and food-integrated value chains, an overestimation of the capacity of the public sector to deliver quality public goods and services to farmers, and a suppression of cooperative producer organizations that could give farmers support in achieving market competitiveness and voice in policymaking. With import substitution industrialization and urban consumer interests dominating the political agenda, the terms of trade were strongly biased against the agricultural sector, with appreciated real exchange rates and trade policies taxing tradable agricultural goods (Krueger et al., 1991). The result was underperformance of the agricultural sector. Public agencies serving agriculture such as parastatal agencies for access to inputs and markets, irrigation districts for free water, and agricultural development banks for subsidized loans—that were in part acting to compensate agriculture for adverse macroeconomic and trade policies—were notably ineffective and frequently outright corrupt. And integrated rural development programs were assessed as largely unsustainable, principally because they relied excessively on the role of the state as a coordinating agency and a source of subsidies (World Bank, 1997). The outcome was broad dissatisfaction with the performance of agriculture, inviting policy shifts toward alternative growth and poverty-reduction strategies.

With implementation of structural adjustment programs and the policies of the Washington Consensus that followed the international spread of the 1982

Mexican debt crisis, sectoral policies were discarded to focus on the macro fundamentals and promote the role of market forces. The 1960s emphasis on the role of agriculture in the classical development paradigm, and the subsequent contradictions in its implementation in the 1970s and early 1980s, were followed for 20 years (basically from 1985 to 2005) by the neglect of agriculture, which was seen as a sunset industry not competitive for public investment. This resulted in a sharp decline in public investment and overseas development assistance going to agriculture, and dismantlement of many of the support agencies to agriculture including agricultural development banks and parastatal marketing agencies. In that perspective, agriculture was no longer seen as the most effective approach to achieve industrialization that could better be obtained through Open Economy Industrialization strategies based on international financial capital movements, foreign direct investment, international transfers of technology, and economies of scale in urbanization (Rodrik, 2006). Combating rural poverty was seen to be more cost effectively achieved through transfer programs and urban migration. Cash transfers, often conditional on child health and education as under the multibillion dollar "Oportunidades" program in Mexico and "Bolsa Familia" program in Brazil, and workfare programs such as the Maharashtra Employment Guarantee Scheme, were put into place, becoming the prime instruments for poverty reduction as opposed to gains in autonomous income earned by the poor, as had been expected under the integrated rural development approach. Food security became a policy concern of secondary importance as it presumably could be achieved via trade with declining international food prices and by helping the poor access food through targeted assistance programs. Low international commodity prices deterred public investment in agricultural research and development. Agriculture was also seen as a suspect for environmental damage, in particular the initial Green Revolution that had made extensive use of agrochemicals and damaged the environment. Finally, agriculture-based rural development projects had met with limited success as they were complex to organize compared to industrialization strategies such as duty-free zones and to welfare programs for the rural poor based on transfers or food-for-work, while technical skills and experimentation were lacking in designing agriculture-based projects. While structural adjustment programs were successful in removing biases in the terms of trade for agriculture that had been caused by real exchange rate appreciation and distortive trade policies, they were ineffective in inducing supply response due to failure to understand the importance of the state for agriculture given the existence of extensive market failures and the special needs of smallholders to achieve competitiveness (Commander, 1989). This long lull in recognizing the importance of agriculture as an instrument for development, and in recognizing the role of the state in supporting supply response in agriculture via public goods and institutional reforms, came to an end as a set of crises exposed in the mid 2000s the high costs of neglecting agriculture.

3. Agriculture in crisis and new demands on agriculture for development

Several major crises have brought agriculture back in the news headlines, restoring agriculture as a sector of concern for policy makers and elevating it in policy agendas as an important instrument for development. These crises are in part the outcome of the flawed interpretations of the importance of agriculture for development in the previous 20 years and of the political economy of urban-industrial biases in policy-making. Crises include the following five aspects that characterize the world food and agriculture situation today.

3.1. Rising food insecurity and hunger

The global food crisis, characterized by sharp increases in international commodity prices over the 2005–2008 period, is presaging continued high prices and high price volatility. Following a century of declining food prices and falling incidence of hunger, the world food situation is now more uncertain. After tripling between 2005 and 2008, the international market prices of rice, maize, and wheat are still 75% above their levels of four years ago (May 2005 to May 2009, see World Bank, 2009). While some countries have had high price transmission (as, for example, rice in Senegal in Fig. 1), transmission has been more limited in many others (as, for example, rice in India and Madagascar in Fig. 1), following patterns that are difficult

Fig. 1. Transmission between international and domestic prices: High in Senegal, low in India and Madagascar (January 2005 = 100).

to predict and highly country specific (Abbott, 2009). Many countries have also experienced sharp price inflation in nontraded foods (e.g., Mali and Senegal for millet in Fig. 2) due to related causes such as population growth, stagnant yields, rising domestic energy prices, and climate change (Daviron et al., 2008). Over the last three years, world hunger in developing countries has increased from 870 million affected people in 2005 to more than 1 billion in 2009 (FAO, 2009), taking the world sharply away from the Millennium Development Goal of reducing undernourishment to 420 million people by 2010. Malnutrition is known to be a major—yet neglected—cause of infant mortality, with more than 5 million children dying each year of malnutrition and related causes (Gross and Webb, 2006). The recent rise in hunger is also associated with the global financial crisis where loss of employment, declining levels of economic activity in the informal sector, and falls in remittances are creating large numbers of "new poor," namely people previously nonpoor but vulnerable to these shocks.

These drastic changes in the world food situation have three major policy implications regarding the current role of agriculture for development. The first is the need to give much greater attention to the supply side of agriculture at both the global and local levels, by achieving sustainable productivity gains and greater resilience to shocks. While the world was food secure from the mid 1970s to the mid 2000s, food security is now not only a matter of access to food for the poor but also of food availability globally and locally. Besides population growth, threats to food availability are related to three phenomena: (1) new supply-side constraints associated with rising water and land scarcity,

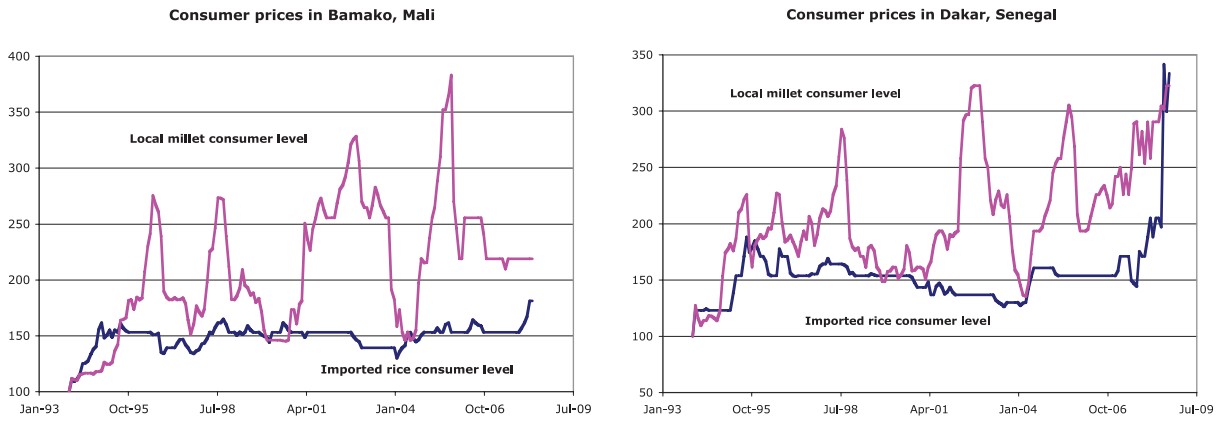


Fig. 2. Transmission between imported and local cereal prices in Mali and Senegal, 1993–2008 (January 1993 = 100).

soil depletion, rising energy prices, and climate change; (2) changes in diets toward animal products that decrease the effective aggregate supply of calories for human consumption; and (3) diversion of land toward other uses such as biofuels production and urban construction. With population growth and changing diets, food production in Sub-Saharan Africa needs to double over the next 20 years, posing a huge challenge. The second is the need to raise anew the issue of food security as a major policy concern. Achieving food security is complex as it requires the coordinated management of policy instruments that include freer trade (including completion of the Doha Development Round), restocking and management of national food reserves (Wright, 2009), increased domestic production to achieve a higher level of food self-sufficiency to respond to changes in relative prices, comprehensive social safety nets, and an increasing role for subsistence farming in securing access to food for large segments of unprotected rural populations. The third is the need to focus food assistance not only on the chronic poor, but also on the nonpoor vulnerable to price and income shocks. This includes a surprisingly large share of the rural poor who are net buyers of food in spite of access to some land. We find, for example, that in India and Guatemala, respectively, 77% and 81% of the poor who were negatively affected by rising food prices were in fact rural households or urban farmer households (de Janvry and Sadoulet, 2009). Existing social safety nets are largely designed to cater to the chronically poor. They are inadequately organized to recognize the vulnerable nonpoor and reach them on time to avoid irreversibilities in child health and education, and in asset decapitalization, when a price or an income shock occurs. Major adjustments need to be made to the way these safety nets are designed if they are to help provide food security to the transitory poor.

3.2. Continued stagnation in Sub-Saharan Africa agriculture

In spite of some improvement starting in 2004, agriculture in Sub-Saharan Africa continues to be largely stagnant relative to population growth and falling behind progress made in the rest of the world. Per capita agriculture value added has stopped declining, but remains stagnant (Fig. 3). Land expansion, which had historically been the main source of growth of cereal production in Sub-Saharan Africa (Fig. 4, left panel), is now compromised by population growth, and land is becoming scarce faster in Sub-Saharan Africa countries than in any other region (Fig. 4, right panel). Yet, yields of cereals remain stagnant (Fig. 5). Fertilizer use is by far the lowest in the world (Sub-Saharan Africa uses only 11 kg/ha compared to 130 kg/ha in South Asia and 271 kg/ha in East Asia), and only 3% of the cropland is irrigated compared to 39% in South Asia and China (Fig. 6). The large exploitable yield gaps (measured as the difference between average yield in farm demonstrations and national yield) in Sub-Saharan Africa create, however, an opportunity for

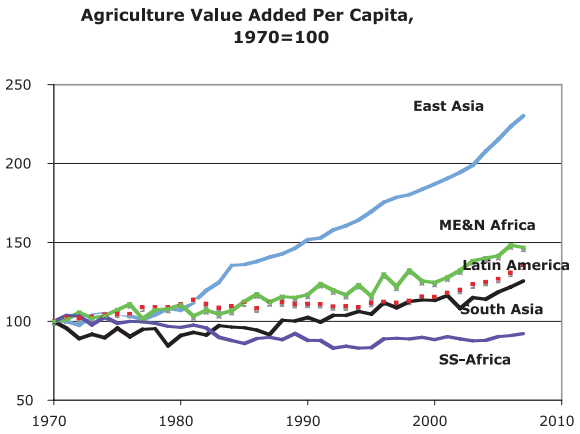
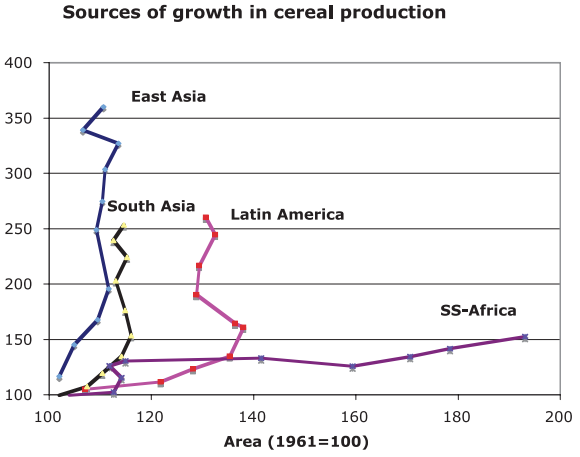


Fig. 3. Agriculture value added per capita across regions (1970 = 100).

rapid productivity growth compared to the rest of the world where gaps are small and prospects weak in the short run for major technological revolutions. Needed is an adaptation of technological opportunities to heterogeneous local conditions, giving solutions to the large gaps in adoption of existing technological innovations, and supporting adoption through "smart" subsidies when there are market failures for the poor and large externalities in adoption derived from learning effects and/or economies of scale in fertilizer markets. Insufficient growth in African agriculture as population continues to rise rapidly results in an increasing absolute number of rural poor (Fig. 7), and an incidence of rural poverty that will make the Millennium Development Goal of halving the poverty rate by 2015 simply unreachable.

3.3. World poverty still overwhelmingly rural

Developing countries, poverty is still a stunning 75% rural, even though rural population is now only 58% of the total (Ravallion et al., 2007). While rural poverty decreased by 153 million people between 1993 and 2002, as the world economy was growing rapidly, this success was mainly due to only one event—China's success—that was sufficient to compensate for failures to reduce poverty in the rest of the world. In East Asia, rural poverty thus declined by 184 million people, while it increased by 33 million in South Asia and Sub-Saharan Africa. Rural poverty remained unchanged in the rest of the world. Renewed attention to agriculture as a source of income is thus needed if the Millennium Development Goal of halving poverty is to be met outside East Asia. This renewed focus on agriculture is justified by the rigorously substantiated observation that economic growth originating in agriculture can be particularly effective for poverty reduction (Ligon and Sadoulet, 2007), which is not surprising given where the poor live, what they do, and the labor intensity of most of world agriculture. With a high share of the rural poor having access to land and relying on their own production for at least part of their food consumption, increasing yields and



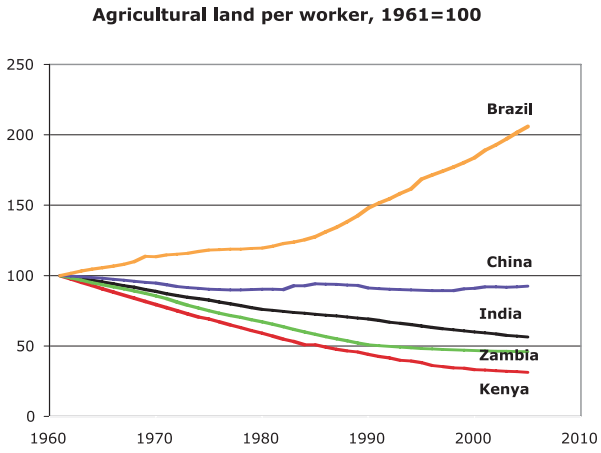


Fig. 4. Sources of growth in cereal production and rising land scarcity across regions, 1961–2007 (1961 = 100).

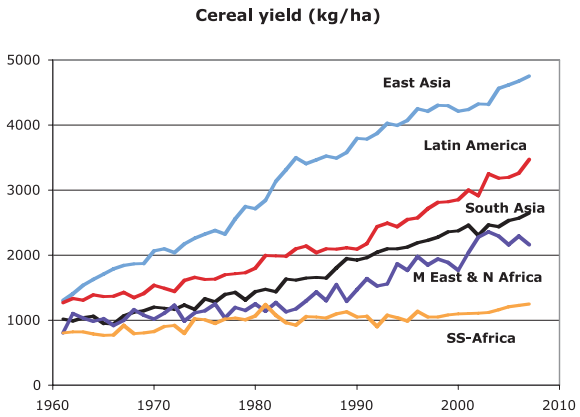


Fig. 5. Cereal yields across regions (1961 = 100).

diversifying production in subsistence farming should be an important, yet largely ignored, part of the response to a food crisis. Subsistence and smallholder farming also serve as safety nets for urban populations when jobs are lost in crisis conditions, providing what Owen called "farm-financed social welfare" (Owen, 1966), with the recent telling example of some 20 million unemployed Chinese workers returning to their villages. Linking subsistence farmers, and most particularly women farmers, to markets and transforming them into net sellers through one-time initial capital endowments and sustained productivity gains in the farming systems they can use, has to be one of the most effective short-run instruments for world poverty reduction.

3.4. *Increasing rural-urban income disparities*

Rising gaps between rural and urban incomes have been a major source of political tensions in rapidly growing countries such as India and China (Hayami, 2005). In India, rural populations have slipped downwards relative to the distribution of urban incomes over the last 22 years, concentrating at income levels that correspond to the poor (but not the extreme poor) in the urban sector (Fig. 8) (Crost et al., 2009). In China, as industrial growth accelerated, the difference between urban and rural mean incomes increased by 150% between 1980 and 2002 after cost of living adjustments (Ravallion and Chen, 2007). These disparities have dominated electoral platforms in India and been the source of widespread grassroots demands for income convergence in China. There is also increasing supportive evidence to the proposition that rising inequalities can contribute to reducing aggregate economic growth, making rising disparities not only a political but also an economic efficiency problem (World Bank, 2005). Raising rural incomes is part of the solution to the sectoral disparity problem. This includes bringing the Green Revolution to favorable rain-fed areas where it has not yet arrived, diversifying production toward

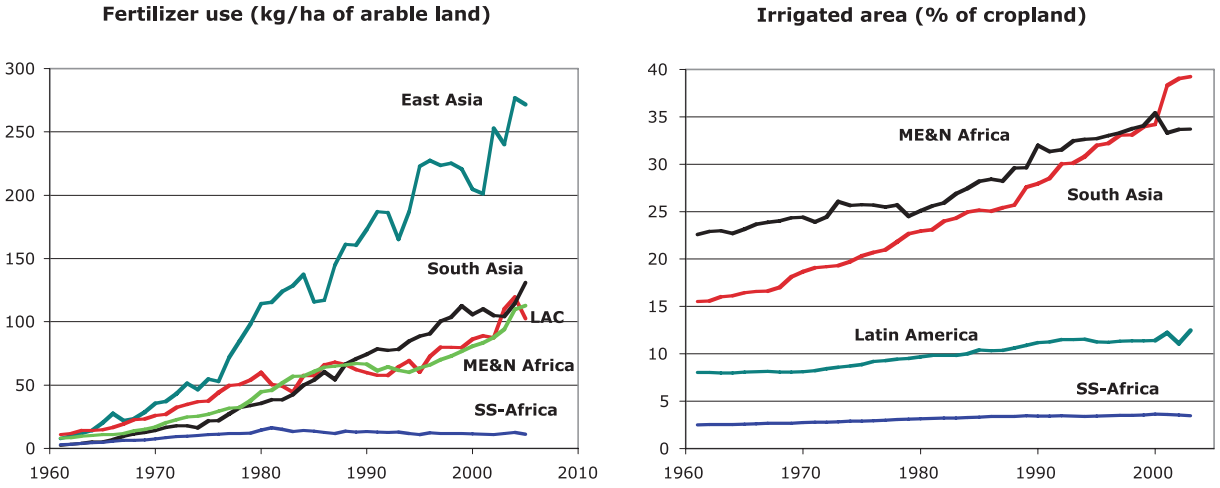


Fig. 6. Fertilizer use and irrigated cropland across regions (1961 = 100).

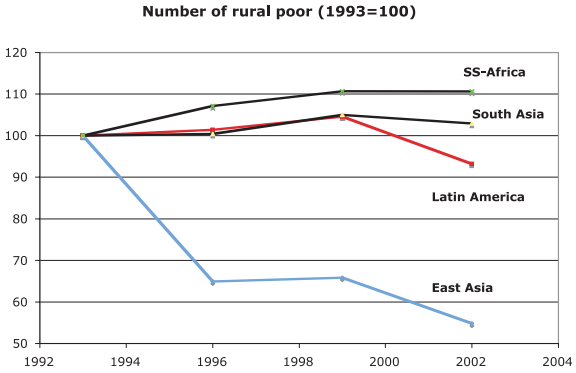


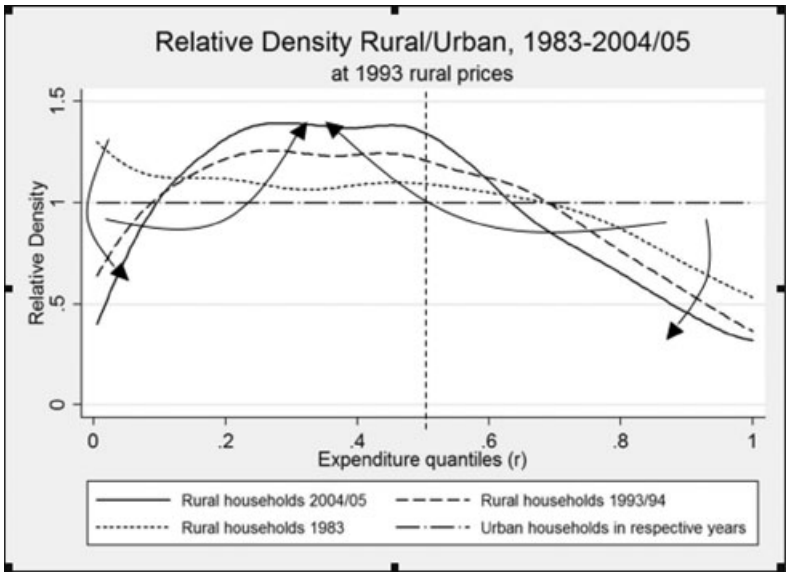
Fig. 7. Rural poverty across regions (1993 = 100).

higher-value agriculture, and increasing employment opportunities in agricultural value chains and the rural nonfarm economy. While rural education and migration are part of the solution, especially for regions with limited productive resources, improved incomes in agriculture and the rural nonfarm economy are the main ingredients to reduced disparities in the short and medium run (Lanjouw and Murgai, 2008).

3.5. Increasing resource scarcity due to excessive use and misuse in agriculture, and underprovision of environmental services

There is a growing resource crisis in agriculture, and it imposes heavy costs on the other sectors of the economy and the world. Agricultural growth is increasingly constrained by water scarcity, soil exhaustion, destabilization of climatic patterns, and rising temperatures. Overuse and misuse of resources by agriculture has led to environmental degradation both in areas of agricultural intensification (through agrochemical pollution, animal waste, and depletion of underground aquifers) and in areas of extensive agriculture (through deforestation, desertification, and loss of biodiversity) (World Bank, 2007). Both make important contributions to climate change, with agriculture accounting for between 25% and 30% of global greenhouse gas emissions.

These pressures of agriculture on resources are frequently reaching crisis levels, compromising the sustainability of yields in some of the world's main breadbaskets such as the Indian Punjab where water tables are falling due to overdraft and water is polluted by



Notes: The horizontal straight line is the density function of urban expenditures across quantiles for 1983, 1993/1994, and 2004/2005. The other lines are the densities of rural expenditures corresponding to the urban quantiles for the same year.

Fig. 8. Increasing rural-urban income disparities in India, 1983 to 2005.

agrochemicals. Overuse of water in agriculture, which accounts for 85% of developing countries' fresh water withdrawal, is also running in conflict with urban water demands. It is well known that the rural poor are the main victims of climate change that affects differentially more tropical and high-altitude areas where many are located. This is because most of the world poor depend on agriculture for their livelihoods, and because they have limited access to instruments for risk management (e.g., diversification of sources of income) and risk coping (e.g., credit and insurance). Clearly, environmental damage is among the current crises of agriculture that brought it up in the news headlines (e.g., expanding livestock and soybean operations in the Brazilian Cerrados and Amazon at the cost of large-scale deforestation). Perverse price and subsidy incentives, incomplete property rights, weak state regulatory capacity, and inability to act collectively for the management of common property resources are huge problems that need attention. Missing markets for environmental services such as avoided deforestation, biodiversity conservation, soil conservation with zero tillage, adoption of water-saving technologies, and terrace maintenance for watershed management contribute to underprovision of socially beneficial externalities. These markets urgently need to be put into place, from the certification of environmentally sound products for consumers, to payments for watershed maintenance by local water users, and to global markets for carbon capture and storage for the international community. Investments in more sustainable technologies have met with success (such as zero tillage in conservation agriculture and sylvo-pastoral systems in agroforestry), but have also been lagging due to free rider problems in technology generation and lack of incentives in adoption when externalities are not internalized.

These major crises are pushing agriculture in the news headlines and up on policy agendas for governments and international development agencies. This is reflected in the explicit support to agriculture in the policy guidelines of the New Partnership for Africa's Development (NEPAD) and its Comprehensive Agriculture Development Program (CAADP). The World Bank made commitments to double its assistance to African agriculture by 2010 and channeled $1.2 billion toward agriculture and food security under its Global Food Crisis Response Program. Crises, with their huge social costs on the poorest, have at least been effective in inducing policy responses and resource commitments toward improved food security.

Crises are also met by opportunities to achieve better results than in the past in using agriculture for development. Most important among those are: (1) An improved macroeconomic context for all sectors in the economy, a positive outcome of two decades of structural adjustment policies. While these policies misunderstood the special needs of agriculture for a proactive state and a sectoral policy in supporting supply response, they at least removed many of the price distortions that were due to exchange rate appreciations and trade policies taxing agriculture (Anderson et al., 2008). (2) New approaches to rural development and the design of agricultural projects with emphasis on decentralization, community participation, the role of civil society organizations, and public-private partnerships (Binswanger, 2006). These approaches, often couched under the rubrics of community-driven development (CDD) and territorial development, show promise in achieving a degree of success that the integrated rural development approach failed to deliver. (3) New agents in development, particularly private actors in integrated value chains that can serve for smallholders as sources of innovation, inputs, contracts providing credit and insurance, and access to new markets (Reardon et al., 2009); and producer organizations that have in countries such as Senegal, Mali, and Ecuador become major proactive actors in assisting their members overcome market and government failures, giving them voice in domestic policy making and international negotiations, and striving to hold governments and public providers accountable for their actions. Also important is the presence of new philanthropic organizations such as the Bill and Melinda Gates Foundation and the FARM Foundation that are bringing efficient business models into the development approaches that historically have been the privy of civil servants, development agency personnel, and nonprofit organizations that rarely had any personal business experience. This is frequently complemented by private business initiatives motivated by the pursuit of corporate social responsibility, as for example under the leadership of the World Economic Forum.

Crises and opportunities thus combine in putting agriculture back on the development agenda, as both a need and a possibility. This second chance in using

agriculture for development has introduced a broadly endorsed new paradigm, even if still short of consistently formulated and massively implemented (Byerlee et al., 2009).

4. Putting agriculture back on the development agenda: toward a new paradigm of agriculture for development

Putting agriculture back on the development agenda is happening in the context of two major changes that require a new approach. The first is a change in the objectives of development, from growth via industrialization to a multidimensional agenda including GDP growth, poverty and disparity reduction, food security, and environmental sustainability. This broadening of development objectives occurred first in the 1970s as growth had happened vigorously during the previous two decades while poverty had failed to decline correspondingly and inequality had increased sharply. In response to this, development had been redefined from industrialization for growth in the 1950s and 1960s to growth for poverty and inequality reduction in the 1970s. This was embedded in new growth strategies, particularly Chenery et al. (1975) "redistribution-with-growth" and Adelman's (1978) "redistribution-before-growth." Development had thus become a multidimensional agenda, a new purpose strongly endorsed by the World Bank that shifted its main objective from accelerating growth to achieving "a world without poverty" (McNamara, 1973). This implies that the development objective that had motivated the 1960s classical development paradigm—agricultural growth for industrialization—is now set too narrowly to match expectations regarding what agriculture can do for development. The second is a drastic change in the structural context where agricultural growth is to occur, including globalization of the food system, emergence of integrated food value chains, major institutional and technological changes for agriculture, increasing resource scarcity and climate change, and the demands on agriculture to serve as a provider of environmental services.

These two changes imply that the way agriculture is used for development has to be adjusted to the new objectives and context, quite different from the ones that prevailed when the classical paradigm was in force. This calls for a new paradigm where agriculture is instrumental for development in its multidimensionality of functions and in the context of the opportunities and constraints that now exist.

5. Why the continued underuse of agriculture for development?

Putting agriculture back on the development agenda has been urged by the set of crises that pushed agriculture up in the news headlines. The call to overcome 20 years of contradictions and neglect and to reprioritize agriculture in policy agendas has been widely heeded in political discourse. But rhetoric has been followed by very incomplete implementation. Antiagriculture biases in the terms of trade have been sharply reduced. In Africa, the nominal rate of assistance to agriculture fell from a negative 13% in 1975–1979 to a negative 7% in 2000–2004, with much of the improvement coming from better fundamentals in macroeconomic policies (Anderson et al., 2008). But a Green Revolution for Sub-Saharan Africa is still hardly in the making. While some countries such as South Africa and Ghana are showing relatively better performance, growth in agricultural value added is overall unchanged (3.2%/year in the 1990s and 3.0%/year in the 2000s) and cereal yields that have shown recent improvement remain by far the lowest in the world (1.3 tons/ha in Sub-Saharan Africa compared to 2.6 tons/ha in South Asia, 3.5 tons/ha in Latin America, and 4.7 tons/ha in East Asia). The labor force continues to leave agriculture in accordance to the regularities of the structural transformation, but without the expected associated GDP per capita growth (Fig. 9). Agriculture in India still has a lackluster performance in spite of priority status in the 11th Five Year Plan 2007–2012 (a growth in agricultural value added of 3.2%/year in both the 1990s and 2000s), and the sectoral income disparities continue to deepen. In Latin America, population growth and land concentration have pushed the rural labor force to the cities, but without sufficient employment creation in urban-based industry and services. In fact, comparing the structural transformation across countries in Asia, Sub-Saharan Africa, and Latin America and the Caribbean in Fig. 10 shows the surprising regularity that, while successful in Asia, it has been about equally unsatisfactory in Latin America as it has been in Africa. In Latin America,

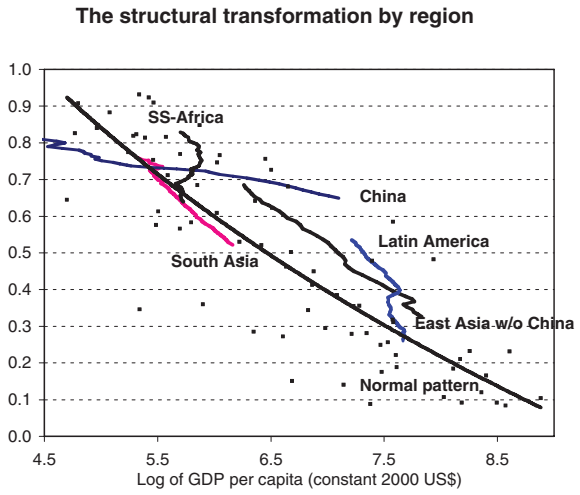


Fig. 9. The structural transformation across regions.

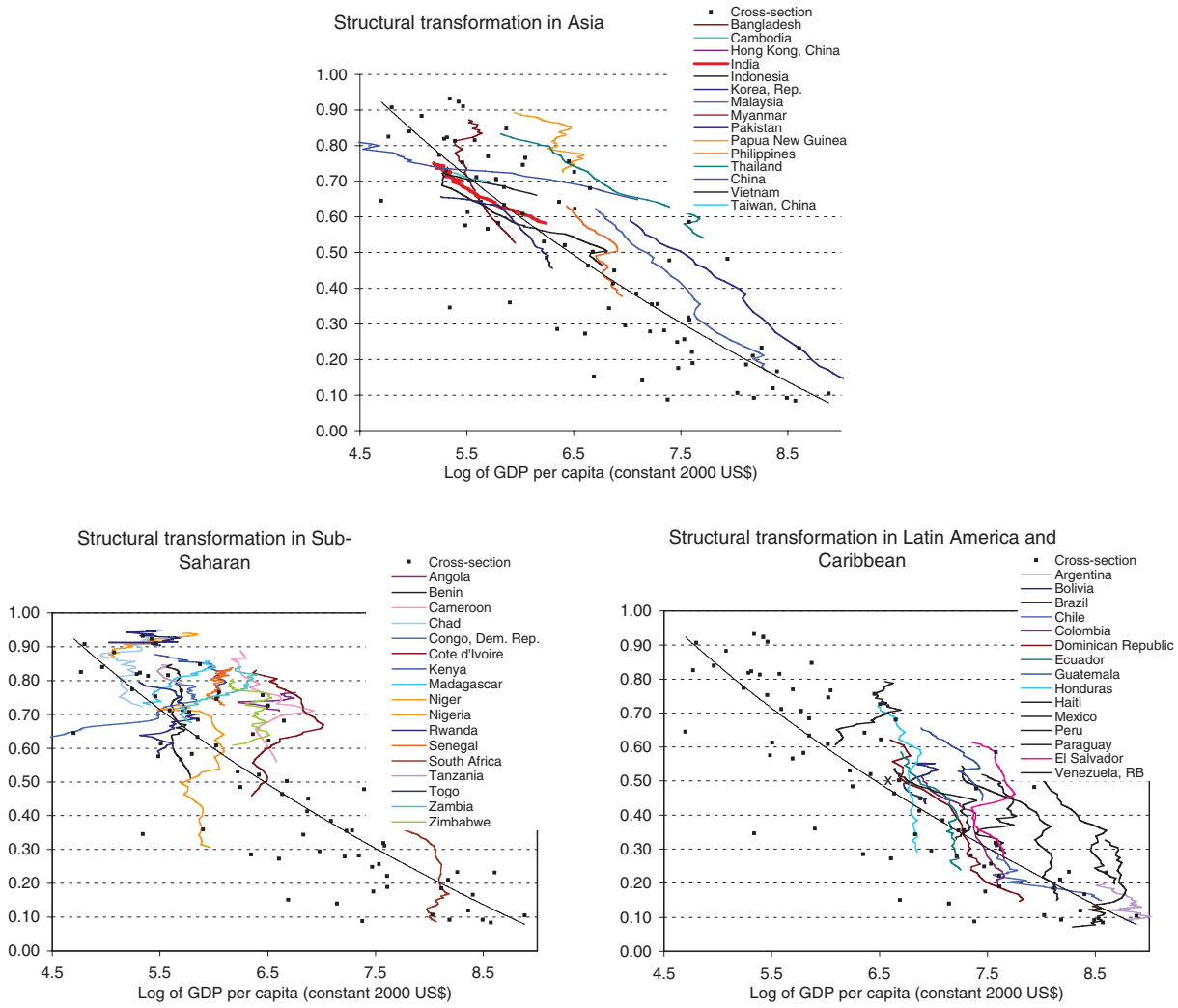
the result has been rising illegal international migration and informal employment. Where poverty has declined in middle-income countries, this has been due to massive social programs as opposed to rising earned incomes by the poor. The result is a gap between discourse and achievement, and reproduction of a set of conditions related to the inadequate performance of agriculture and conducive to the emergence of recurrent crises.

This gap is most visible in the continued low and often misguided public expenditure going to agriculture. While successful former agriculture-based countries[2] typically allocated no less than 10% of their public expenditures to agriculture, and NEPAD chose this benchmark as a guideline for the Sub-Saharan Africa countries, few current agriculture-based countries are reaching this level (Fig. 11). Data in recent public expenditure assessments for African countries show 3% for Uganda and 4% for Nigeria. The gap is also visible in the share of agriculture in Organization for Economic Cooperation and Development official development assistance (ODA) to Africa that declined from 20% in 1990 to still less than 5% today, with no major aggregate reversal (Fig. 12). Rising support has happened in some countries, most notably in Burkina Faso (7.9% of ODA going to agriculture), Malawi and Mali (5.3%), and Uganda (5.2%). However, these percentages are disproportionately low compared to the benchmarks provided by the share of agriculture in GDP, the share of the rural population in total poverty, and the budget shares allocated in historically successful countries. In that perspective, the G8 announcement on July 9, 2009, that foreign aid would give greater emphasis on investment in agriculture, with a $20 billion commitment over the next three years, is a welcome and long-awaited turning point (G8, 2009). The hope is that this may be signaling a return to greater attention given by ODA to investing in agriculture in support of food security, nutrition, and sustainable development, particularly in the countries least able to respond to a food crisis.

More research is needed in estimating the rate of return to public investment in agriculture, the GDP growth value of a dollar of investment in agriculture versus other sectors of the economy, and the conditions under which these returns can be increased. We have extensive evidence about the rate of return from investment in agricultural research showing, in spite of selection biases in the cases analyzed, that returns can repeatedly be above opportunity cost for public funds (Alston et al., 2002). But we also know that many very poor investments have been made in agriculture, with public funds diverted to private subsidies in response to rent seeking accounting for 75% of total public expenditure in India and 40% in Latin America (World Bank, 2007). Agricultural investment projects have also been faring poorly on a comparative basis, following misguided approaches such as the training-and-visit extension system, subsidized credit, and integrated rural development that have since been discontinued.

What are the main causes of the continued underutilization of agriculture's potential for development, in spite of statements to the contrary and some remarkable comebacks to investing in agriculture? There are of course many reasons, and they are idiosyncratic to specific contexts. Yet, two fundamental causes can be singled out for lack of implementation of the agriculture for development paradigm. One is insufficient reconceptualization of the role of agriculture for development to correspond to the new development objectives and to the new contexts and conditions for agriculture to perform. The other is insufficient redesigning of approaches for effective implementation of the agriculture for development paradigm.

[2] Agriculture-based countries are defined in the WDR2008 as countries where agriculture contributes approximately one-third of overall growth and more than 70% of the poor are in the rural sector.



Notes: The smooth line is the cross-country normal pattern of structural transformation.

Fig. 10. The structural transformation across countries in Asia, Sub-Saharan Africa, Latin America, and the Caribbean.

6. Moving forward in using agriculture for development: two options for success

Agriculture has thus come full circle from being the main pillar for industrialization, seen then as synonymous to development, in the classical development paradigm, to implementation failures and policy neglect, and back to being seen as a pillar in a new paradigm of agriculture for an enlarged perspective on development under the push of cumulative crises and the pull of new opportunities. The emerging new paradigm of agriculture for development is quite different from the classical paradigm as both development objectives and contexts and conditions under which agriculture performs are quite different from the way they were in the 1960s. Visibility in the news headlines, pronouncements of political support, attention by some international and philanthropic development agencies, and G8 resource commitments have been achieved. Yet, successful implementation is still elusive, with continued lack of support in public budgets and in overseas development assistance. The

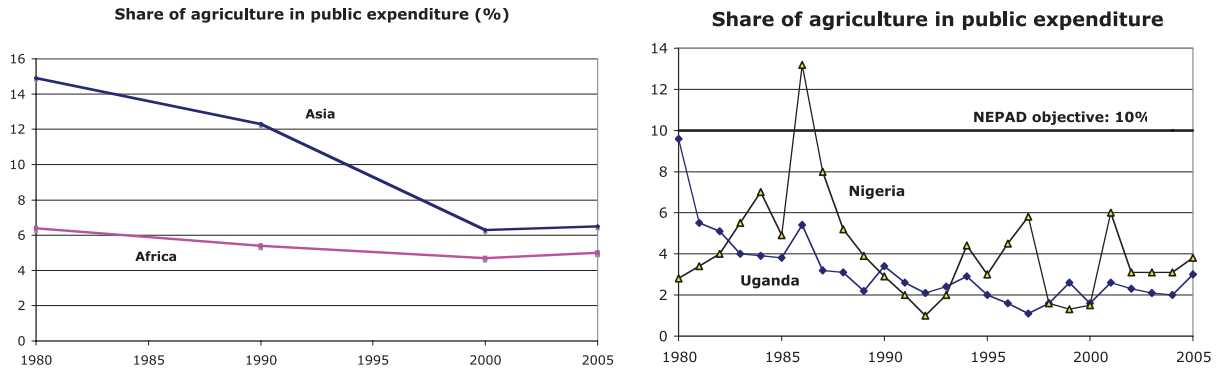


Fig. 11. Public expenditures on agriculture.

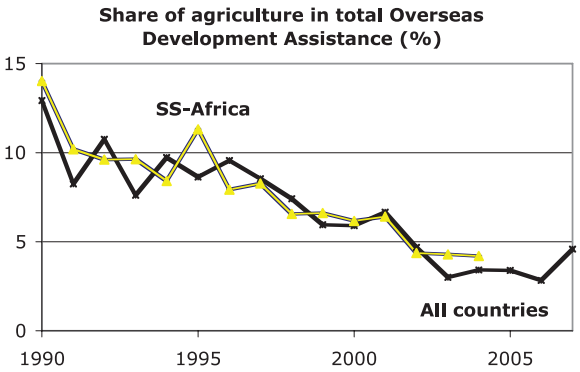


Fig. 12. Overseas development assistance to agriculture.

economic, human, and environmental costs of delayed implementation have been enormous, and will keep on mounting. For Africa in particular, there is no option but success in implementing the agriculture-for-development paradigm if major humanitarian crises are to be avoided. What will it take for success to happen? We argue that there are two major lines of action that require attention for success to follow: reconceptualization of the role of agriculture for development and redesign of approaches for effective implementation.

6.1. Reconceptualization of the role of agriculture for development

The role of agriculture in the classical development paradigm was well conceptualized and informed, with historical support, formal modeling, quantitative simulation exercises, and a set of policy prescriptions. The new paradigm currently falls short of these forms of support. The reconceptualization task is particularly daunting as the functions of agriculture for development are now multiple, the very process through which agricultural growth is achieved matters if it is to yield development in addition to higher piles of cereals, and the role of the state in relation to the market and civil society needs to be reimagined. We discuss each of these issues in turn.

6.1.1. Formalizing the complementarities and trade-offs in the multiple functions of agriculture for development in the emerging contexts

The context where the role of agriculture for development is to be modeled is one characterized by globalization (of trade, capital movements, migration, transfers of technology, emissions, and even land transactions), integrated value chains with large economies of scale and market power, technological innovations that include major advances in biotechnology and in Information and Communication Technologies, institutional innovations with progress toward more complete financial services and more effective producer organizations, and environmental pressures with greater resource scarcities and increasing risks associated with climate change. Models are needed to capture the complementarities and trade-offs in the multiple development outcomes as agriculture performs in these contexts. The models we have today are, however, generally still quite removed from meeting these needs, and attention given to this research theme by

the economics profession has declined and is vastly insufficient. Major efforts must be made to bring agriculture into estimated (and hence beyond calibrated computable general equilibrium) models that can help us understand what determines the performance of agriculture and how it translates into different development outcomes according to the contexts that prevail. This is a tall order, and work is in progress (e.g., Fan, 2008). Success in this work is a condition for effective policy design in using agriculture for development that needs to be of much greater concern to the economic profession.

6.1.2. Designing the process of agricultural growth to achieve development

Some of the development objectives in using agriculture for development, growth in particular, can largely be driven by market incentives in the context of a supportive investment climate. Reduction of resource overuse in agriculture can also be achieved through market incentives with the proper allocation of property rights and pricing of resources. Putting into place exchange platforms to trade water can be a powerful incentive to reduce water use in agriculture once it has an opportunity cost in other applications to which it can be sold by the rightful owners. The provision of environmental services, as one of the development functions of agriculture, can be transformed into market responses by offering payments for environmental services, eventually institutionalized into marketplaces that allow to trade externalities (as for $C0^2$ and water services). However, other functions of agriculture for development such as poverty reduction, the narrowing of sectoral disparities, gender equity, and intergenerational sustainability in resource use must be obtained through social choices made about the very process through which growth is achieved (short of pure ex-post income redistribution). In the new paradigm, process thus matters along with product if the multiple dimensions of development are to be achieved. This implies that social choices must be made in weighting the various development outcomes of agriculture. Small farms may be preferred over (or in association with) large farms not only on efficiency grounds (if an inverse relation exists between total factor productivity and farm size), but also because they allow income generation by the rural poor, even if sometimes at the cost of a growth trade-off.[3] Technologies that create employment in agriculture and in agribusiness may be preferred over labor-saving technological changes as the labor market becomes an increasingly important instrument through which productivity gains in agriculture are translated into welfare gains for rural populations. Agroecological approaches may be preferred when negative externalities in chemical-based farming cannot be internalized, even if at the cost of yield and risk trade-offs, and even if they are more demanding in public assistance to achieve a productivity revolution for Sub-Saharan Africa. Particularly in the world of international development agencies, we have too long wished for a world where win-wins dominate the outcome set, in part to avoid protracted political debates (as for example in the growth-equity debate, see Banerjee et al., 2006). But win-wins have to be recognized as the exception more than the rule. Trade-offs in the process of agricultural growth thus require making difficult social choices, expectedly based on solid information and democratic participation to establish priorities, requiring a set of institutions and practices that typically need to be reinforced in developing countries.

6.1.3. Redefining the role of the state in setting social priorities among conflicting functions and in overcoming market failures for agriculture

Rightly or wrongly done in practice, the state was central to the classical development paradigm in the 1960s and 1970s. Differentially across countries, it played a key role in implementing land reforms, investing in research and extension, stabilizing prices, providing access to inputs and credit, managing irrigation schemes, and coordinating rural development. Under the Washington Consensus in the 1985–2005 period, stabilization, and adjustment policies severely reduced the size and functions of the state in agriculture, minimizing in particular the role of sectoral policies. Expectation was that the private sector would pick up the functions left open by the state. As we by now know well, this happened very partially at best, leaving

[3] Dercon (2009) for instance suggests that stimulating agricultural production in smallholder farming in Africa may be needed for social inclusion even if other sectors can me more effective for growth because market failures prevent the rural poor from moving out of poverty via the labor market.

huge gaps in institutional support for agriculture and especially for the smallholder sector. Largely ignored by the agents of the Washington Consensus was that agriculture suffers from major market failures and is unusually dependent on state support to achieve growth and development, a painful lesson in irreversibility derived from the OECD farm policy experience where state support was extensive. The result has been underperformance relative to expectations, opening the door to a series of crises that we analyzed above.

Redefining the role of the state in using agriculture for development is thus essential, and also a major incomplete task. Lack of clarity has been a source of major inefficiencies, as ill-defined and ill-performed state functions stand in the way of private sector investment and performance, and undermine the effectiveness of producer organizations. Along with the emerging context for agriculture to perform its development functions, a new state needs to emerge. This state must have the capacity to work with the private sector and producer organizations, regulate externalities and market competitiveness, provide public goods, be the guardian of processes in the way agricultural growth is achieved so that it will deliver development, set priorities among competing functions of agriculture for development, provide safety nets, and insure sustainable outcomes. For the state, agriculture is no longer the road to industrialization, but an instrument in a multidimensional development process. Lack of attention to this redefinition will be a major cause of delays in the successful use of agriculture for development.

6.2. Redesigning approaches for effective implementation

Development requires that reconceptualization be accompanied by effective redesign of approaches for effective implementation. We discuss three aspects of redesign: experimentation for learning, fixing the governance structure for agriculture, and committing public support to agriculture over price and political cycles.

6.2.1. Experimenting with new approaches and internalizing lessons for scaling up successes

As opposed to what is often said in activist donor circles, it is a serious mistake to believe that we know what should be done, and all that is left to do is doing it. Because objectives and contexts are novel, we are entering unchartered territory that needs to be researched and experimented with. Extraordinary new opportunities exist to successfully invest in agriculture for development, but they must be carefully identified. What we know is that a "Green Revolution" for Africa will have to be different from what it was in Asia, and hence that it is left to be designed. As opposed to Asia, Sub-Saharan Africa has a mainly rain-fed agriculture with many different agroecological conditions and it also has highly fragmented social systems. Heterogeneity and local adaptation must consequently be part of the solution. In addition, conditions for success are demanding. Soils are generally exhausted, infrastructure (roads, water control) is weak and often non-existent, levels of education and health among farmers are low, the private sector in value chains is incipient, the investment climate is frequently uninviting, and many countries are small requiring regional collaboration to achieve economies of scale in providing many public goods. A Green Revolution for Africa must also address challenges that did not exist at the time of the Asian Green Revolution. It must deal with sustainability and environmental friendliness as a process, and hence go beyond a seed-fertilizer-water package to extend toward agroecology, agroforestry, and conservation agriculture. It must go beyond cereals to encompass locally specific food crops such as roots and tubers and banana plantains, as well as high-value activities such as fruits and vegetables, livestock, and fish. It must address brand new challenges such as climate change (particularly vulnerability to climate shocks and the resilience of farming systems) and the forces of globalization (particularly competition with producers dispersed across the world and benefiting from uneven state support, increasingly volatile prices, and rapidly changing requirements for grades and standards in value chains and supermarkets). It must redefine the roles of the state and civil society in support of agriculture for development, recrafting institutions beyond structural adjustment as part of "second-generation reforms" (Stiglitz, 2006). And it is under pressure to succeed urgently given the rapid changes in the world food situation and the recurrence of crises.

Innovation, experimentation, evaluation, and learning must thus be central to devising new approaches to

use agriculture for development. This requires putting into place strategies to identify causal impacts as we proceed with new options. Too much of our econometrics still reports unidentified "determinants" that cannot be used for policy advice because they measure correlates instead of causalities. To date, rigorous identification in agricultural economics remains more an exception than the rule, perhaps more so than in other fields of application of economics because of greater difficulty in doing so compared to health and education where most of the impact analysis has been confined. This is a serious and insufficiently recognized handicap in introducing new options as to how to use agriculture for development.

If additional resources are effectively going to flow toward agriculture following the G8 call for a scaled-up use of agriculture for development, it is fundamental that lessons be derived from past mistakes in implementing the classical paradigm, and that new approaches be devised, experimented with, and confirmed before scaling up is attempted (Easterly, 2006). More investment will only yield more development if new ways of using agriculture for the broadened development objectives and in the new context where it must perform have been established. There is otherwise a huge risk of resource wastage and serious disappointments if we return to agriculture without knowledge of better ways of how to use it for development.

6.2.2. Fixing the governance structure for the state to fulfill its new functions for agriculture

The new functions to be assumed by the state in supporting effective use of agriculture for development are daunting. They include addressing current forms of market failure (e.g., complementarities between public and private research, intellectual property rights for biotechnology innovations, security of access to land in Sub-Saharan Africa, excessive price volatility in guiding investments and insuring food security, and lack of risk-sharing options to invest in agriculture), regulating competition in the private sector, engaging in public-private partnerships and the management of "smart" subsidies, and supporting effective decentralization for agriculture. Correspondingly, redesigning the structure of Ministries of Agriculture and the public sector in support of agriculture remains an unresolved and unsatisfactory dilemma in using agriculture for development (Wiggins and Cabral, 2007). The "new ministries" must be able to not only manage agricultural policy but also integrate it with the rest of policymaking and coordinate multisectoral approaches. In the perspective of agriculture for development, ministries should largely have a multisectoral territorial function, with agriculture only one (if the most important to them) sector of economic activity. A territorial approach would allow us to take very different perspectives on such fundamental issues as price volatility (with better compromises between the interests of producers and consumers, including the many net buyer smallholders), biofuels (with better balance between delivering energy, protecting consumer interests, and managing environmental impacts), and food quality based on proximity (with better trade-offs between consumer health and cost concerns). To serve for development, the "new ministries" must consequently be concerned not only with agriculture, but also with the welfare of rural populations, consumer food safety, and the provision of environmental amenities. The corresponding administrative structures are still largely to be imagined.

Governance cannot make agriculture work for development without giving a fundamental role to civil society organizations. Progress with governance must consequently be accompanied by parallel efforts to promote effective producer organizations that can have voice in public affairs. Yet, little emphasis is generally given by governments and development agencies to the role of rural organizations in development that they often see as challengers and lobbies rather than partners. Learning how to work with organizations is thus part and parcel of the institutional reconstruction of agriculture in support of development.

6.2.3. Committing the state and the international community to support the long-term role of agriculture for development above price and political cycles

Food crises have been recurrent in time and space over the last century, in spite of secularly declining prices (Gardner, 1979), and conditions are in place for more and deeper crises to come. Like all crises, they have huge costs, particularly on the poor. Policy instruments to respond to a food crisis typically include trade (reducing tariffs if an importer and increasing taxes if

an exporter), destocking of public reserves, consumer price subsidies, safety net programs for the poor, and short-term boosts to supply response in agriculture (Delgado, 2009). Yet, poor countries with weak fiscal and administrative resources have little capacity to use these policy instruments, with the result that most of their poor remain unprotected when crises come, particularly their rural populations. For these countries, essential is consequently to invest in preventing crises from occurring (Timmer, 2009). If preventing crises is a necessary option, how should this be done, given the past failures? Public investments in R&D and in infrastructure such as water, roads, and market facilities are the key to agricultural growth. When prices fall, due to effective public investments in agriculture at a world scale, there is a long cycle whereby agriculture becomes neglected by governments and donors. This neglect becomes the source of future crises. Because there is a long lag in how public investment in agriculture translates into output response, avoidance of future crises (as population and income effects continue to increase demand, in addition to demands for biofuels and climate change) requires continued public investment in sources of productivity growth and resilience of agriculture even when the prices are low. We must thus learn that low market prices are not the proper signal in allocating public resources to agriculture. In electoral cycles, short-term competition over public budgets dominates over long-term considerations. Hence, what countries need is a commitment device that can elevate public investment in the sources of productivity growth in agriculture above price and political cycles. Countries that have made long-term commitments to public investment in agricultural research and education, such as the United States with its Agricultural Experiment Station system and Brazil with its Agricultural Research Corporation, Embrapa, have reaped large benefits when food crises return.

Hence, we need to take the long view when investing in agriculture given the existence of extended lags in productivity effects, and to resist the tendency to recurrent neglect by governments and donors when prices are low. With neglect, as observed over the 1985–2005 period, high prices can return with a vengeance. Sustained investment in agriculture is a political choice, since market signals fail in guiding public investment over the long run at prevailing discount rates. The political economy of food crisis avoidance is thus one of committing public expenditures to agricultural productivity gains over and above price signals and over and above short-term government budget priorities. Making public expenditures in sources of agricultural productivity gains into a state policy is thus a necessary commitment device. This requires giving public agricultural R&D institutions budgetary guarantees and administrative autonomy to protect resources from short-term market signals and political cycles.

7. Conclusion: the way forward

The classical paradigm of agriculture on the road to industrialization that prevailed in economic thought in the 1960s and 1970s no longer matches needs as development objectives have broadened and the contexts and conditions for implementation have changed dramatically. The subsequent 20-year neglect of agriculture seen as a sunset industry for development has contributed to serious crises with huge economic, social, and environmental costs. Crises and opportunities have prompted the emergence of a new, yet still incomplete, paradigm of agriculture for development that has been shown to work in several countries. Conditions are currently favorable to its implementation as a consequence of high public consciousness about its relevance with agriculture repeatedly in the news headlines, political pronouncements of concern with food security in response to electoral demands and popular discontent, and attractive investment opportunities for producers with high prices and new dynamic markets. Yet, putting the paradigm of agriculture for development into practice has been lagging in too many countries, especially in Sub-Saharan Africa where successful implementation is both critical and urgent.

We have advanced the interpretation that current lags in implementation have been due to incomplete reconceptualizations and insufficient redesign of approaches in using agriculture for development. Reconceptualization will require: (1) Scholarship applied to formal economic modeling of complementarities and tradeoffs in the development outcomes that can be achieved through agricultural growth; (2) priority setting and coordination to use the process of agricultural growth as an instrument in achieving nonmarket development outcomes; and (3) participation to redefine the relative roles of the state, the market, and civil society

in using agriculture for development. Redesigning approaches for effective implementation will require: (1) Experimentation, evaluation, and learning to identify causalities in new approaches to achieve the desired development objectives; (2) institutional innovations to redefine the shape of governance needed for agriculture to achieve its development functions; and (3) credible commitments by governments and international organizations to sustain investment in agriculture above price and political cycles.

What we derive from this analysis is that reconceptualization and redesign of the approaches to successfully use agriculture for development are complex and demanding. The biggest mistake one could make about using agriculture for development is the belief that it is easy to do and that we already know all we need to do it. It is not and we don't. It requires significant additional resources, new expertise (which is in serious deficit at all levels, including in international organizations), coordination among many actors, and sustained commitments. Half-way measures and discontinued efforts will not produce results. Recent commitments by several governments, international organizations, and philanthropic donors show promise. But, like in the classical theory of the Big Push proposed by Leibenstein (1957) in the 1950s and recent applications of concepts of multiple equilibria to development by Sachs (2005), payoffs will only happen if the effort is sufficiently massive, concerted, and sustained. Lessons must be derived from past mistakes, and new approaches devised and evaluated. In that sense, additional resources are necessary, but far from sufficient in insuring success. While complex and demanding, there is little choice and much urgency to the need to succeed in this effort given the current and predicted world conditions for food and development.

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