

Policy Brief

| *Wider Atlantic Program* |

In Brief: The last 15 years have seen remarkable transformations in farming practices, institutional frameworks, and policies for agriculture in the Southern Cone of South America. A combination of dynamic international markets and the diffusion of bioinformatics technology are shifting large-scale farming toward a new organizational model. At the other end of the spectrum, efforts have been made to reinsert family farming into institutional markets such as school meals and public crop purchases. This policy brief provides an overview and discussion of these changes and includes considerations of their potential relevance for African agriculture. The Brazilian experience makes clear that only a combination of agricultural zoning, agreements on responsible agricultural investments, and guidelines on land tenure, which in their turn condition access to credit, can ensure an institutional framework for effective agricultural policies. It seems clear that policy continuity is a precondition for success in the promotion of food production and agricultural and rural development.

Agricultural Models and Best Practices from Brazil and the Southern Cone: Lessons for Africa?

by *John Wilkinson*

Introduction

The last 15 years have seen remarkable transformations in farming practices, institutional frameworks, and policies for agriculture in the Southern Cone of South America. This policy brief provides an overview and discussion of these changes and includes considerations of their potential relevance for African agriculture.

A combination of dynamic international markets and the diffusion of bioinformatics technology — i.e., the application of computer technology to measure and analyze large amounts of raw biological data — are shifting large-scale farming toward a new organizational model. For their part, public research programs are looking beyond mono-cropping systems toward the integration of farming, cattle-raising, and forestry.

At the other end of the spectrum, efforts have been made to reinsert family farming into institutional markets such as school meals and public crop purchases as well as special quality markets (whose quality derives from the methods and conditions under which they are produced such as geographical indications, organics, and fair trade). Access to Brazil's national biodiesel market, which was created from scratch through compulsory blending, is via a public auction system

whereby participating firms must guarantee that a specified percentage of their raw material comes from family farm organizations. At the same time, civil society entities and government policies have been promoting an agro-ecological farming model geared to increasing the autonomy of small farmers from the inputs industries and offering a low cost entry option into the potential of the organics market. Farmer networks such as Ecovida in Brazil's southern states of Santa Catarina and Paraná organize hundreds of farmers along agro-ecological principles. Brazilian NGOs such as Kairos are coordinating a national network of community-supported agriculture initiatives.

During this same period, new forms of coordination and control are being imposed over production systems seeking greater integration into international markets, which demand traceability of origin and concern with deforestation, working conditions, quality, and health care. Commitments to international agreements and conventions regarding biodiversity, climate change, food security, and land use are creating a new bottom line for good agricultural practices. Brazil is a major player in developing these practices.

Over the last decade, Brazil has not only substantially increased its “cooperation for development” programs with the African continent but has taken a lead, along with the Food and Agriculture Organization of the

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United Nations (FAO) and other international bodies, to promote agricultural initiatives for food security based on the family farm. It has similarly stimulated investments in large-scale farming drawing on the experience of its successful agribusiness sector. The Brazilian Agricultural Research Corporation (EMBRAPA), a public body, has established itself on the African continent and is involved in a range of technology transfer programs.¹

In this analysis of developments in Argentina and Brazil, attention is drawn to the difficulties of transferring production models from one institutional context to another and this caveat will certainly apply with even greater force when considering the relevance of developments in the Southern Cone for the African continent. Nevertheless, the Brazilian and Southern Cone experiences provide a rich laboratory for evaluating different agricultural practices and rural development policies, and the lessons to be learned from this region can provide a major input for public and private actors involved in the promotion of African agriculture.

The “Argentinian” Large-Scale Farming Model and New Patterns of Governance

In recent years, there have been references to the “Argentinization” of the Brazilian agricultural frontier in the savannah regions of central and northern Brazil.² This expression refers to a radical process of rural depopulation in Argentina resulting from the adoption of large-scale mechanized agriculture and the movement of farmers into urban areas.³ Bioinformatics allows for the automated, tailor-made application of inputs such as seeds and fertilizer, which

1 John Wilkinson, “Brazilian Cooperation and Investment in African Agriculture,” *Actionaid report* (November 2013).

2 Antônio Márcio Buainain, Eliseu Alves, José Maria da Silveira, and Zander Navarro (eds.), *O Mundo Rural no Brasil do Século 21 [The Rural World in Brazil in the 21st Century]* (Brasília: EMBRAPA, 2014).

3 Christophe Albaladejo, Xavier Arnauld de Sarte, and Pierre Gasselín, “Agriculture Entrepreneuriale et Destruction du Travail dans le Pampa Argentine,” [Entrepreneurial Agriculture and Destruction of Work in the Argentine Pampas] in *Études Rurales [Rural Studies]*, no. 190 (2012): 177-192.

simultaneously simplifies farming practices and moves farming expertise toward off-farm services rather than local farmers. In trying to identify the main forces at work in recent transformations of the global agri-food system, authors have variously focused on the dominance of the major corporations,⁴ large-scale retail,⁵ the “land grabbing” phenomenon of large land purchases by foreign capitals,⁶ and the generalized “financialization” of the agrifood system.⁷ Fewer contributions have focused on technological transformations in agriculture⁸ and here the focus has been almost exclusively on the way transgenic seeds, which incorporate genes into the plant to provide resistance to pests or pesticides and herbicides, increase control by the agricultural inputs supply industry that integrates chemicals and genetics.

Argentina, however, has seen dramatic changes in its agricultural practices as cattle farming has been replaced by soy in the Pampas region. Two tendencies were the initial focus of attention. The first of these was a farmers’ innovation that became known as no-till farming. In this practice, transgenic soy resistant to herbicides was valued because it not only lowered input costs, but also allowed for a radical reorganization and simplification of the labor process. The land no longer required tilling prior to planting and the need for chemical spraying was radically reduced. Labor requirements were reduced by roughly 80 percent.⁹

4 Philip McMichael, “The Land Grab and Corporate Food Regime Restructuring,” *Journal of Peasant Studies*, vol. 39, no. 3-4 (2012): 681-701.

5 David Burch and Geoffrey Lawrence, “Towards a Third Food Regime: Behind the Transformation,” *Agriculture and Human Values*, vol. 26, no. 4 (2009): 267-279.

6 GRAIN, *Land Grabbing and the Global Food Crisis*, presentation (December 2011), <https://www.grain.org/article/entries/4164-land-grabbing-and-the-global-food-crisis-presentation#>.

7 S. Ryan Isakson, “Food and Finance: The Financial Transformation of Agro-Food Supply Chains,” *Journal of Peasant Studies*, vol. 41, no. 5 (2014): 749-775.

8 Gabriela Pechlaner and Gerardo Otero, “The Third Food Regime: Neoliberal Globalism and Agricultural Biotechnology in North America,” *Sociologia Ruralis*, vol. 48, no. 4 (October 2008): 351-371.

9 Guillermo Anlló, Roberto Bisang, and Jorge Katz, “Aprendiendo con el Agro Argentino: de la Ventaja Comparativa a la Ventaja Competitiva,” [Learning from Argentine Agriculture: From Comparative Advantage to Competitive Advantage] *Inter-American Development Bank discussion paper no. IDB-DP-379* (Inter-American Development Bank: Santiago, Chile, May 2015).

Farming as a business could now be rethought, particularly because the absentee farmer tradition of relying on rental income already provided precedent, which was widespread on the Pampas in the days of cattle-raising. Various authors analyzed what they saw as a “managerialization” of Argentinian farming,¹⁰ whereby outside companies took over responsibility for farming operations. This was then further theorized as a new style of production system led not by the farmer but by “agricultural production firms” coordinating a network of inputs and services suppliers.¹¹ This second tendency of network production is now seen to be replacing farming in what is argued to be a paradigm shift for agriculture.

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The iconic firm in network production is Los Grobo, which was the object of a Harvard Business School case study.¹² Many other firms in Argentina, however, have adopted the same model — El Tejar, MSU, Cresud, Adecoagro, Calyx Agro, AGD, Unitec Agro and Olmedo.¹³ These firms all have somewhat different profiles, depending on their origins within the agri-food system. All share, however, the basic model of

10 Carla Gras and Valeria Hernandez, *La Argentina Rural: De la Agricultura a los Agro-negocios [Rural Argentina: From Agriculture to Agribusiness]* (Buenos Aires: Biblos, 2009).

11 Anlló, Bisang, and Katz.

12 David Bell and Cintra Scott, “Los Grobo: Farming’s Future?” *Harvard Business School Case 511-088* (December 2010).

13 Carla Gras and Andrea Varrotti, “El Modelo de Negocios de las Principales Megaempresas Agropecuarias” [The Business Model of the Main Agricultural Megabusinesses] in Carla Gras and Valeria Hernandez (coords.), *El Agro como Negocio: Producción, Sociedad y Territorios en la Globalización [Agriculture as a Business: Production, Society and Territory within Globalization]* (Buenos Aires: Biblos, Sociedad, 2013).

using and sub-contracting logistical, financial, and technical expertise to simultaneously manage a large number of farming units under leasing arrangements. While many of these firms own and manage their own lands, buying and selling land as well as farm management are clearly separated and often formalized into property and operational firms.¹⁴ These firms usually rely on equity funding and may have been launched on the stock exchange. Smaller firms called “planting pools,” which were set up to share planting equipment, manage production in a similar manner on smaller holdings in Argentina.

Informatics are as decisive as biotechnology in this network production model. Global positioning systems (GPS), and computerized agricultural machinery linked via satellites allow for the implementation of precision agriculture where inputs are calibrated exactly to the differences in soil and meteorological conditions on an increasingly precise scale. The result is a radical simplification of on-farm activities and an equally radical intensification of the off-farm knowledge base behind farming practices. This knowledge is stored, analyzed, and transformed into operational farm-specific programs by firms such as Los Grobo. For Los Grobo, these “soft” assets constitute the firm’s core business, whereas “hard” assets, from land to machinery, are mobilized as much as possible via different leasing arrangements.¹⁵

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¹⁴ Madeleine Fairbairn, “‘Like Gold with Yield’: Evolving Intersections between Farmland and Finance,” *Journal of Peasant Studies*, vol. 41, no. 5 (2014): 777-795.

¹⁵ Futuristic visions speculating on a marriage between intelligent automated agricultural machinery, including drones, and “big data” programing point to the complete disappearance of the farmer along with the farming/rural community.

However, while we are witnessing the emergence of a new bioinformatics technology paradigm, the degree of its implementation depends on the institutional and regulatory framework in each country. According to the Harvard Business School case study, Gustavo Grobo, the head of Los Grobo, was very much influenced by transaction costs economics, which sees the firm as an asset-light bundle of contracts. From this perspective, production itself is less of a challenge than the act of coordinating the actors and activities that enable production to occur. Argentina provided favorable conditions for the development of this model because it has a strong property rights regime, a boom in soy production for export that attracted highly qualified professionals from outside of the agricultural sector, and a tradition of rentier farming. In addition, the fact that much land was previously dedicated to cattle ranching meant that properties were of a size that could optimize the potential of the new technology paradigm. A minimum viable swath of land for Los Grobo would be around 5,000 hectares.

By 2010, however, 70-80 percent of arable land in Argentina was already under lease to the new “agricultural production firms” and further expansion involved moves into the neighboring soy producing countries — Uruguay, Paraguay, and above all Brazil. Uruguay provided no problems since it had a similar tradition of farming and a highly educated middle class of technicians, ideal for the development of partnerships. Paraguay proved more problematic with its weaker worker protections and a much smaller professional middle class. Brazil, however, was the decisive challenge given the scale of its production and the opening up of vast frontier regions for soy production through deforestation to the north of the country.

In addition to Los Grobo, most of the new Argentinian firms (El Tejar, Cresud, MSU, and Adecoagro) moved into Brazil where similar Brazilian and foreign firms were already investing in agricultural land and production (SLC Agricola, Tiba Agro, Brasilagro, Insolo, Agrinvest, and Ceagro, among others). Los

Grobo established partnerships with Pactual Capital Partners (PCP) and Ceagro, an independent grain trader.

In Brazil, two major challenges confront the “Argentinian” model. Much of the grains frontier was occupied by knowledgeable “hands-on” farmers with a strong farming tradition dating back to the European immigration to the south of the country since the last quarter of the 19th century. Ownership of land, therefore, became proportionately more important but also more problematic given Brazil’s tighter legislation on foreign land purchases. Equally challenging is Brazilian labor legislation, which prohibits subcontracting for tasks that are considered to be central to the nature of the activity — planting, spraying, and harvesting in the case of agriculture.

As mentioned, Los Grobo partnered with Ceagro in Brazil, which was acquired by Mitsubishi in 2013, leading Los Grobo to leave the Brazilian grains business, although an eventual return has not been ruled out. In the Harvard case study, Gustavo Grobo appraised future growth prospects: “The opportunity in Brazil is big. If we can succeed here, I think we can leverage our platform to move to other continents. But if we haven’t gained traction in two to three years, we should rethink our expansion strategy.”¹⁶ In the same article, Grobo extended his vision to Africa: “If there’s the need for 50 million more hectares of arable land, 25 million will come from Latin America and 10 million from Africa.”¹⁷ He hoped Los Grobo could leverage its Latin American expertise to launch in Africa when the time was right. If things went well in Brazil, Grobo thought he might leverage his Portuguese-speaking ability to consider entering Mozambique and/or Angola.

Los Grobo and similar firms are witness to the emergence of a new technology paradigm for large-scale agriculture. However, in the process of their expansion

from Argentina into neighboring Southern Cone countries, different institutional, cultural, and regulatory frameworks have posed substantial challenges to its diffusion, which will be particularly acute in the case of promoting large-scale grains production in African countries along these lines.

Beyond the question of challenges to diffusion, the question of the model’s desirability from a social perspective should also be considered. The president of the Argentine Agrarian Federation opposes the implementation of this model, citing the following example: “In my village of 3,500 inhabitants, we farmers are some 350 and work 36,000 hectares. We buy our bread in the village; when a machine breaks down, we take it for repair to the village; we buy gasoline and fertilizers in the village. A short time ago I read of a ‘pool’ which cultivates 35,000 hectares complaining of the low profitability. One ‘pool’ cultivates the same area as 350 farmers in our village and we create jobs for a village of 3,500. That’s the difference between the one agricultural model and the other” [author’s translation].¹⁸ In other words, questions of how many people are employed by competing models are worth considering.

In the United States, there has been some resistance to this model since it is seen to be giving insider access to a farm’s basic data, which could eventually be used to prejudice the farmer from a competitive perspective or with regard to insurance or land valuation. In Brazil, EMBRAPA proposes the adoption of a combined farming, cattle-raising, and forestry production system rather than grains monoculture on the savannah front-

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¹⁶ Bell and Scott, 8.

¹⁷ Ibid.

¹⁸ Leila Guerriero, “El Mago de la Soja,” [The Wizard of Soy] *El País*, August 5, 2015, http://elpais.com/elpais/2015/08/04/eps/1438698239_623902.html.

tier.¹⁹ If this were to be widely adopted, the complexity of the farming model may demand more hands-on farming methods. Many issues will therefore have to be resolved if the Argentinian model is to establish itself as the large-scale farming format that most effectively exploits the potential of the bioinformatics technology frontier, particularly in African countries.

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In addition to its organizational and technological model, the large-scale farming sector in the Southern Cone has been the object of important regulatory and governance innovations. Both Argentina and Brazil have introduced restrictions on the scale of foreign land investments. In Brazil, global calls to protect the Amazon forest region and global ambitions for its sugarcane ethanol production have led to important agreements on agricultural investments and production practices. In particular, a zoning policy has been agreed upon that specifically excludes sugar/ethanol production in the Amazon and the Pantanal wetlands and also in areas of rich natural biodiversity. A Forestry Code was passed in Congress, and although the final version has been subject to considerable criticism, the protection of rivers and hilltop coverage as well as limits on deforestation are now binding in law. All farmers must now also have an environmental register that maps land use on their properties, and satellite systems are moving toward monitoring in real time. The provision of credit increasingly requires adherence to the above requirements.

19 Davi Bungenstab, Roberto de Almeida, and Horst Schwartz, *Integrated Crop-Livestock-Forestry Systems: A Brazilian Experience for Sustainable Farming* (Brasília: Embrapa, 2014).

Civil society organizations have also played a major role in promoting multi-stakeholder governance of agrifood production chains designed to ensure adherence to social and environmental demands. Greenpeace and Friends of the Earth have been active in achieving a moratorium with the global traders on the marketing of soy from recently deforested areas in the Amazon and with the leading meat packers in the case of cattle farms. In São Paulo, multi-stakeholder “pacts,” involving leading supermarkets, meat packers, the vegetable oils industry association, and both social movement and business NGOs, were similarly agreed on to boycott the sale of uncertified forestry products, meat, and soy from the Amazon region.²⁰ Government regulation and social pressures leading to private forms of governance, therefore, combine in introducing social and environmental criteria as constitutive components of the bottom line in good agricultural practices.

Policies and Strategies for Strengthening Small-Scale Farming

Since the end of Brazil’s military dictatorship in 1985, and particularly since the launching of the National Program for Strengthening the Family Farm (PRONAF) in 1995, Brazil has seen the adoption of a range of policies for integrating family farming into a variety of different market dynamics.²¹ A number of these policies are already providing guidelines for international policies being implemented in a number of developing countries in the Americas, Asia, and Africa. Social movements and civil society organiza-

20 Daniela Chiaretti, “Empresas de São Paulo Assinam Pacto pela Amazônia,” [São Paulo Businesses Sign Amazon Pact] *Valor Econômico*, October 15, 2008.

21 The social movements and policies directed to agrarian reform are not addressed in this paper, but they have been of considerable importance in Brazil. On paper, the figures are impressive – some 80 million hectares have been incorporated into agrarian reform, involving some 1.2 million families. Nevertheless, there has been no change in levels of land concentration. In addition, INCRA data indicate that over 40 percent of those settled have abandoned their properties. On the other hand, research has pointed to successful settlements and areas where these have been responsible for broader local and regional development. Whatever the evaluation, it is clear that agrarian reform requires huge financial and human resources in addition to solid institutions and favorable political conditions.

tions have also been active in the construction of alternative marketing networks and the promotion of niche segments in mainstream markets based on values associated with small-scale farming.

The collapse of agricultural commodity prices in the 1980s, corroding the basic monetary incomes of millions of small farmers, provoked four types of responses from different actors. International organizations, particularly regional development banks, provided credit incentives for a shift to “non-traditional” exports (fresh produce, seafood, and flowers). While this made macro-economic sense, it generally involved cultivating and developing different regions as well as involving actors other than those involved with traditional commodities. Leading firms, both industry and retail, insisted on the shift to higher quality products with price premiums, which offered an alternative to better organized and more qualified small farmers but also imposed considerable entry barriers for the majority of the small farming population. Social movements, for their part, confronted the decline in agricultural commodity prices head-on with demands based on redistributive justice, and they launched the Fair Trade movement. At the same time, entry into the WTO, part of a broader move to align with the liberalization of markets, brought with it the need to introduce trade-related intellectual property rights and with it legislation and institutional initiatives related to geographical indications. This coincided with a range of movements to capture value for the small farm sector through the appeal to tradition, artisan practices, and the promotion of the “rural.”

While all of these strategies offered solutions for different small producer groups, the sector as a whole was faced with ever-worsening conditions either through direct competition from large-scale agriculture or more generalized competition from the urban economy. In response to this, and building on the PRONAF, a range of policies has been developed in Brazil to provide market access for the small farming sector as a whole. These policies offer relevant lessons

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and insights that could inform policies on the African continent. The PRONAF itself has evolved since its inception in 1995 and has continuously added sub-programs to better capture the heterogeneity of the sector and has moved from specific agricultural product support to a more holistic concept of the small farmer production system. Successive evaluations of the program, however, have highlighted the concentration of resources on the better organized and more technically advanced small farmers, particularly those involved in contract integration with large agribusiness firms. Contract integration is certainly an option for significant numbers within the small farming sector but tends to skim off the higher performers. Only a minority is contracted and many are excluded over the years as quality and scale demands become prohibitive.

Perhaps the most ambitious Brazilian program for incorporating broad sections of family farmers from all regions in the country on the basis of their traditional farming systems has been the National Biodiesel Program. This program, launched in the first year of the government of President Luiz Inácio Lula da Silva in 2003, embraced a discourse of social inclusion and can be seen as a counterpoint to Brazil’s bioethanol program, which is overwhelmingly focused on large-scale operations. The initial goal was for up to 200,000 family farmers from all regions of the country with an oil crop to be included for the production of biodiesel, chosen based on regional adaptability and capacity to integrate into traditional family farming systems. Preference was given to the poorest regions — the semi-arid northeast and the north — where castor oil and palm oil, respectively, were to be promoted. In the south and the center-south, soy would be the chosen oil crop.²²

22 John Wilkinson and Selena Herrera, “Biofuels in Brazil: Debates and Impacts,” *Journal of Peasant Studies*, vol. 37 no. 4 (2010): 749-768.

Ensuring social inclusion demanded an intricate political construction of the biodiesel market. Credit lines were advanced to stimulate investment and construction of biodiesel plants, but in order to ensure that raw material sourcing was contracted with family farmers, the government premised access to the biodiesel market on participation in auctions organized by the National Petroleum Agency. Participation in the auction depended on gaining a Social Fuel Certificate from the Ministry of Agrarian Development attesting to adhesion to the requirements regarding the raw material used (percentages and origin in accredited associations or cooperatives). Rural unions, agrarian social movements, state governments, and state enterprises (such as Petrobras), all were mobilized to promote the goal of social inclusion.

From a macroeconomic viewpoint, the program has been impressive, with production of over 4 billion liters per year meeting an obligatory blending level currently at 7 percent. Socially, the results are more ambiguous. In 2009, only 37,000 family farmers were participating in the program. This number had risen to 84,000 in 2014. Of these, 75 percent were soy farmers from the south. Soy is currently responsible for 76 percent of the raw material used for biodiesel, with tallow accounting for a further 20 percent.²³ The participation of palm and castor oil is negligible despite the involvement of considerable human and capital resources, particularly from Petrobras. The main beneficiaries of the program have been the better organized family farmers in the south who are already well integrated into diverse markets.

Three important lessons can perhaps be learned from Brazil's biodiesel program. First, markets can be designed to favor the integration of family farmers in commodity chains, particularly in the form of contract farming. Second, the best organized family farmers, those already integrated into markets, tend to benefit most from policies aimed at the family farming sector

23 Repórter Brasil, *Biodiesel, 10 Anos: Os Desafios da Inclusão Social e Produtiva* [Biodiesel, 10 Years: The Challenges of Social and Productive Inclusion], 2014.

The best organized family farmers... tend to benefit most from policies aimed at the family farming sector as a whole.

as a whole. Finally, many farmers with limited access to land and with few resources to confront adverse agro-ecological conditions are unable to benefit from such programs despite high levels of human and capital investment. The lessons to be drawn from the Brazilian experience can serve as an important guide to the biodiesel initiatives in African countries, with South Africa being the most developed example.²⁴

Perhaps one of the most distinctive features of Brazil's family farm policies has been the resurgence of markets organized by the state, in the form of the Food Purchasing Program (PAA) and the reformulation of the School Meals Program, whereas earlier policies and social movement initiatives attempted to gear the family farming sector to modern retail or markets based on appeals to social values (fair trade, organics, etc). The PAA was launched in 2003 and marked a break with the past to the extent that it was directed exclusively to PRONAF-eligible farmers. In addition to contributing to the formation of food stocks and price supports, purchases are distributed to beneficiaries of a range of social programs, particularly for the promotion of food and nutrition security.²⁵

The program has internalized many of the values of "alternative food networks," such as approximation between producers and consumers, stimulus for local

24 High Level Panel of Experts on Food Security and Nutrition (HLPE), *Biofuels and Food Security* (Rome: UN Food and Agriculture Organization, 2013).

25 Catia Grisa and Silvio Porto, "Dez Anos de PAA: As Contribuições e os Desafios para o Desenvolvimento Rural," [Ten Years of the PAA: Contributions and Challenges to Rural Development] in Grisa and Schneider (orgs.), *Políticas Públicas de Desenvolvimento Rural no Brasil* [Public Policies for Rural Development in Brazil] (Porto Alegre, Brazil: Federal University of Rio Grande do Sul (UFRGS) Editora, 2015).

and regional products, promotion of organics and agroecology, and recuperation of rustic seeds. This reflects the involvement of social movements in public policies. In 2014, the program reached some 185,000 family farmers and, in contrast to the biodiesel program, has had more success in ensuring participation from the poorest regions of the northeast. Involvement can be individual or via associations facilitating access. The value of purchases has increased from R\$145 million in 2003 to R\$838 million in 2012.

The main lines of the PAA have been embraced by the FAO as a model for international diffusion, and five Sub-Saharan countries have already initiated similar programs. The reformulation of the School Meals Program is very much in line with the PAA and stipulates that 30 percent of the value of school meal purchases should be provided locally and preferentially by the family farm sector. This component has also been taken up in the international diffusion of public food purchasing policies. Reservations with regard to the program include an excessively complex administrative structure, the limited reach of the program given that the family farm sector contains over 4 million properties, and the vulnerability of the program to changes in political mood.

Conclusion

Brazil and the Southern Cone countries are developing new farming and marketing models in both their large-scale business and family farming sectors, which over the last decade and a half have provided laboratory conditions for evaluating new profiles of agricultural production and marketing. These models could be of great relevance for other developing countries, particularly those on the African continent.

With respect to large-scale farming, the new Argentine model draws on the potential of the bioinformatics paradigm to virtually supplant the “owner-operator” model with a network of suppliers and services piloted by a lead firm that is asset-light but heavy on proprie-

tary knowledge systems. The successful diffusion of this model will depend on the degree to which it can adapt to different institutional arrangements and respond to strong social and environmental contestations.

These models could be of great relevance for other developing countries.

In the promotion of family farming, Brazil has taken the lead on the political construction of markets for biofuels designed to ensure levels of contract integration with family farmers on the basis of cash crops that are part of their traditional farming systems and that also take into account regional specificities. This strategy has its difficulties, and there is also the tendency for successful integration to be limited to the better organized and better off family farmers who already tend to be integrated into the market economy.

Brazil has also exploited the potential of institutional markets for the benefit of the family farming sector and broader policies of food and nutrition security. Influenced by the close integration of social movements and public policies, this program also promotes local food production and consumption systems, organic and agro-ecological practices, and local or regional products. The promotion of local food supply systems and the preferential participation of the family farm sector have also been built into the School Meals Program. As in the case of large-scale farming, some limitations and vulnerabilities exist in these institutional food markets designed to strengthen the family farming sector.

As global concerns with food security put the spotlight on the African continent and its agriculture to provide for rising domestic populations and incomes as well as world markets, the Brazilian experience can provide important lessons. In spite of the tensions

and conflicts, African nations, like Brazil, will have to negotiate the co-existence of very different farming systems, ranging from those of traditional communities, to small-scale diversified family farms, to commercial farms of varying scales. The Brazilian experience, which increasingly converges with broader international initiatives, makes clear that only a combination of agricultural zoning, agreements on responsible agricultural investments, and guidelines on land tenure, which in their turn condition access to credit, can ensure an institutional framework for effective agricultural policies. Many areas of sub-Saharan Africa are looking to Brazilian large-scale grains farming as a model for developing their savannah regions. With experience of over 30 years, EMBRAPA is convinced that long-term sustainability depends on the shift away from monoculture and toward the integration of livestock, farming, and ranching systems. As similar agricultural frontiers are being opened in African countries, it is important that these conclusions are taken into account. Brazil also has some 30 years' experience of promoting family farming and traditional farming systems. In this area, it has become clear that as food supply systems modernize, only a fraction of traditional farmers are able to respond to the new logistics and quality demands. The role of the state in promoting institutional markets such as school meals and in guaranteeing crop purchases has been shown to be important for supporting rural incomes and employment. For over 20 years in Brazil over the course of different governments, agricultural policies in support of family farming have been continuously refined and expanded, and it seems clear that such policy continuity, which was guaranteed in federal law, is a precondition for success in the promotion of food production and agricultural and rural development.

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