

Food System Transformations: Brazil, Rwanda, and Vietnam

Prepared by the International Food Policy Research
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with input from the Brazilian Agricultural Research Corporation
(EMBRAPA), the Food and Agriculture Organization of the United
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Executive Summary

Brazil, Rwanda, and Vietnam implemented forward-looking policies that led to their improved food security and nutrition. Alongside strong agricultural productivity growth, high profitability, and improved nutrition, these countries attracted private sector investment along the entire food value chain. The presence of strong partnerships contributed to this success. Government-led initiatives were complemented with collaborations that led to improvements, including, for example, climate-smart approaches to agricultural production. Further, food system transformations in these countries contributed to significant reductions in hunger and undernutrition. These transformations did not happen without setbacks, however; a common challenge was the issue of inclusive land rights, especially for small farmers. This document describes food system transformations in Brazil, Rwanda, and Vietnam by comparing several aspects of the food system—including interventions in land tenure, nutrition, and finance—against the backdrop of each country’s political economy. It also discusses remaining and emerging challenges in each country. These case studies present a variety of context-specific approaches that could provide lessons for other countries and help pave the way to a transformed global food system.

Country-Specific Pathways

Brazil, Rwanda, and Vietnam followed different pathways to transform their food systems; they are each at different levels of transformation.

Brazil’s transformation emphasized agricultural research and development (R&D) in combination with investments in technology-driven agribusiness. The government invested heavily in agricultural R&D by establishing and supporting the national research system with participation from states’ research systems and agricultural universities. Additionally, macroeconomic stability, favorable international prices, and the maturation of tropical agricultural technologies set a foundation for a new era in Brazilian agribusiness.

Rwanda’s food system transformation should be viewed as a mixed case: much progress has been made within the country, but there is still much to be done. The country’s development centered on agriculture as an engine for economic growth through private sector involvement, land tenure reforms, and rural development. By removing unnecessary barriers and offering regulatory incentives, Rwanda created a conducive environment for agricultural and food businesses to flourish. Challenges exist, however, in reducing the prevalence of undernutrition in the country, along with mixed results from land tenure reforms.

Vietnam's experience focused on land reforms together with agriculture-led growth and nutrition-sensitive approaches. Land reforms in support of smallholder agriculture greatly enhanced agricultural growth in the 1990s, which contributed to higher rural incomes and to the movement of labor into non-agricultural sectors. While rural incomes grew, the government increased investment in nutrition and health programs, which helped accelerate the reduction of hunger and undernutrition.

Role of the Private Sector

Each's country's progress depended on private sector involvement in various aspects of the food system.

In **Brazil**, the private sector provided extension services, implemented new technologies along the value chain, and led nutrition education programs. The development of new crop varieties that are more nutritious was made possible by public-private partnerships. To build on these fruitful outcomes, a more enabling environment for private sector investment would promote further growth.

The **Rwandan** government's reforms to promote private sector participation have made the country one of the best places to do business in Africa. Industries, consumer associations, and the government formed public-private partnerships, which boosted the supply chain for nutrition. Private sector involvement could be enhanced through improved infrastructure, such as better roads and electricity.

In **Vietnam**, engagement with the private sector, including public-private partnerships, contributed to improving nutrition via supplementation and fortification initiatives and for promoting climate-smart agricultural approaches. Moving forward, better governance and transparency will heighten private sector involvement in the country.

Moving Forward: Sustaining Success

As their economies progress, it is inevitable that newer challenges will emerge in these three countries. Appropriate measures must be considered in order for countries to sustain their successes. For instance, staple crop production is increasing in Rwanda yet undernutrition remains a challenge that the country must still address. Brazil and Vietnam have made impressive changes to their food systems, but also currently experience modernizing food value chains that are presenting new challenges. For example, both countries are experiencing supermarket growth as a result of urbanization and changing consumer preferences that call for better hygiene and food safety standards among traditional retailers. Brazil is also experiencing

increasing numbers of overweight and obese people, a problem that was rarely mentioned during the implementation of the Zero Hunger policy. As the country moves forward, the ticking time bomb of overweight and obesity requires a new approach to transform the food system in response to this emerging challenge.

Next Steps

These case studies need to be further substantiated then shared widely, in an effort to help inform the decisions that shape national food systems worldwide. To provide more evidence-based validation of these cases, further research and analysis are required within each country. The Knowledge and Innovation Hub being developed as part of [Compact2025](#)—a new initiative facilitated by the International Food Policy Research Institute (IFPRI) to support the elimination of hunger and undernutrition worldwide—is well-positioned to help meet these requirements.

Brazil's Food System Transformation

Summary

Brazil's food system transformation strong macroeconomic policies, political stability, and forward-thinking investments in agricultural R&D, which helped spur key innovations. Complementary policies supporting the agriculture sector focus on rural credit systems, public food acquisition, extension, risk management, and adoption of climate-smart approaches; these have also helped to advance transformation. Through remarkable growth in agricultural productivity combined with strong social protection policies, Brazil made great progress in reducing hunger and undernutrition; however, overweight and obesity are on the rise. Brazil must continue to address persistent inequalities, particularly in policies favoring large farms over small farms, which have contributed to food and land tenure insecurity among other issues. Still, Brazil's experience can offer important lessons for prioritizing investments in agricultural R&D and social protection, as well as engagement with the private sector, particularly public-private partnerships.

Background

Brazil has transformed its food system primarily by moving away from a traditional, low-productivity agriculture sector toward technology-driven agribusiness; the parallel shift in investments helped position Brazil as one of the greatest breadbaskets of the world. Against a backdrop of strong macroeconomic policy, political stability, and effective, long-term investments to support agriculture, Brazil has become a global powerhouse in agricultural trade. The country has gone from being a net food importer in the 1960s and early 1970s to one of the world's largest exporters. In 2013, exports of agricultural raw materials and food trade were six times higher than in 1995, topping US\$100 billion ([UNCTADSTAT 2015](#)). These successes, however, must be weighed against the environmental and social costs of more intensive and extensive agriculture, including pressures on displaced farmers and farm workers to migrate to urban centers.

The key conditions that catalyzed Brazil's transformation began with industrialization in the 1960s and 1970s as well as rural-urban migration. The growth of the urban population and of per capita incomes between 1950 and the early 1980s strengthened food demand by up to 6 percent annually. The increased opportunity cost of labor for farmers and the massive rural exodus led to a supportive environment for agricultural growth and modernization on a large scale. From the mid-1990s, macroeconomic stability, favorable international prices, and the maturation of tropical agricultural technologies launched in the preceding 15 years settled the basis for a new era in Brazilian agribusiness ([ESCAP 2012](#)).

One such policy was the government's heavy investment in applied agricultural R&D by establishing and supporting the national research system, led by [Embrapa](#), with participation from state research systems and agricultural universities. This and other policies helped leverage the country's vast endowments of resources to reach—and elevate—its potential to greatly improve agricultural productivity growth.

The biggest transformation of Brazilian agriculture was in the Cerrado (savannah) region, an area of 207 million hectares in central Brazil. Until the 1970s, the Cerrado was exclusively occupied by inefficient livestock production (that is, one cattle for every 5 to 10 hectares). The transformation of agriculture in the region was enormous. According to the Embrapa Cerrado Research Center, the Cerrado's share of national production for the harvest year 2013/14 was 45 percent for maize, 55 percent for soybean, 55 percent for beef, and 95 percent for cotton.

Transformations also occurred in downstream segments of Brazil's food system. Growth in the supermarket sector has changed the way most Brazilians access food: the majority now purchase food in supermarkets or hypermarkets as opposed to traditional retail stores ([Reardon et al. 2005](#)). This requires greater coordination between suppliers and retailers, as well as higher standards for quality and safety.

While noting remarkable agricultural and food system transformations, a broader view of Brazil's approach presents a more mixed picture in which smallholder farming also gets some of the credit. The government supports—through bifurcated and sometimes contradictory agricultural policies—two modes of agricultural production: agribusiness and large-scale mechanized production on the one hand, and smallholder farming on the other ([Netto n.d.](#)). Longtime government subsidized agribusiness and large-scale farming generated production gains above national requirements and provided foreign exchange. Brazil's 4.4 million family farms (mainly small-scale) that account for 70 percent of national agricultural production and 77 percent of rural employment are also substantially supported by some Brazilian policies, although undermined in others ([Chmielewska and Sousa 2011](#); [International Policy Center for Inclusive Growth/World Food Programme 2013](#)). Large agribusinesses, however, account for 62 percent of the value of production and the bigger share of national agricultural exports ([Chmielewska and Sousa 2011](#)). It is worth noting, however, that Brazil has managed to have both agricultural modes coexist—a balance that most other countries have failed to achieve because large-scale, export-led agriculture has greatly predominated ([Schutter 2014](#)).

There are underlying problems related to the food system transformation in Brazil. The country has a highly unequal distribution of its immense land and natural resources—including forests, grasslands, wetlands, and water—and land concentration is increasing. The poor have inadequate access to land, and land tenure insecurity is an issue ([USAID 2011](#)). Rural-urban

migration has created a predominantly urban society, with 84 percent of the population living in urban areas. That means only 15 percent of Brazilians live in rural areas, with only 11 percent engaging in agriculture ([FAOSTAT 2013](#)). With most of the population living in urban areas and not producing agricultural products, access to food is a challenge for poor, urban Brazilians. To address food insecurity, in 2003, the government began massive social welfare spending and programming under the *Fome Zero* (Zero Hunger) national food security policy framework.

How Brazil Transformed its Food System

Productivity: A key component of the transformation in Brazilian agriculture has been the impressive growth in output and productivity. Production volume drastically increased as did production efficiency. Between 1985 and 2006, agricultural output grew by 77 percent. Cumulative total factor productivity (TFP)—which measures how efficiently and intensely farmers use their inputs for production—rose by an impressive 176 percent compared with 82 percent for developing countries as a whole ([IFPRI 2012](#)). Overall, Brazilian agriculture has registered productivity growth of 3 percent annually from 1975 to 2010 ([USDA ERS 2012](#)).

Nutrition: Alongside transformations in the food system, Brazil also enacted policies and programs to make great headway in eliminating hunger and undernutrition. Widespread social protection reforms and targeted nutrition interventions, under the national food security policy framework *Fome Zero*, helped to drastically improve food security and nutrition in a short amount of time ([IFPRI 2013](#)). As part of the reforms, existing transfer programs were consolidated under Brazil's flagship social program, popularly known as *Bolsa Família* (Family Allowance) ([Holmes et al. 2011](#)). The widespread program, which promotes improved education and healthcare for beneficiaries, has had success integrating with other social programs and policies for food security and nutrition ([de Souza 2009](#)).

Through the National Programme for Strengthening Family Agriculture (PRONAF), small-scale family farming is promoted (via subsidized agricultural credits, crop insurance, and technical assistance) as a means to raise rural incomes and increase food supply quantity and quality. Nearly two million families benefit from PRONAF ([Oxfam 2010](#); [Rocha 2012](#)). Additionally, the Food Acquisition Programme (PAA) and the National School Nutrition Program (PNAE) seek to create demand and stable market prices for products from small-scale farmers. Under PAA, the government buys produce from small farms for its food programs ([Oxfam 2010](#)). With the PNAE, the government uses products purchased from smallholders to provide free, nutritious meals for school children ([Guinn and Hamrick 2014](#)). Additional policies that have supported nutrition-sensitive approaches include the scale-up of public investments in education, healthcare, clean water, and sanitation ([von Braun et al. 2008](#)).

Consequently, Brazil has already eliminated hunger and is close to ending undernutrition. The prevalence of undernourishment declined from 15 percent to its elimination between 1990 and 2006 ([FAO 2015](#)). The prevalence of child stunting fell between 1989 and 2007 from around 19 percent to 7 percent, although this figure is understood to have dropped even further since 2007 ([FAO 2013](#)).

Despite such progress, Brazil is increasingly challenged with overweight and obesity as an emerging burden of malnutrition. In 1975, 19 percent of men and 29 percent of women were overweight, and in 2014 these figures rose to 54 percent and 48 percent, respectively ([Brazilian Institute of Geography and Statistics 2014](#)). To combat the problem of growing malnutrition in the form of overweight and obesity, the government of Brazil released new dietary guidelines in 2014 to encourage the intake of oils, fats, sugar, and salt in moderation and to limit the consumption of processed foods.

Resilience: Brazil is increasing investments to improve resilience. For example, the government has invested to expand warehouse capacity and subsidize agricultural insurance and loans ([Fan and Brzeska 2014](#)). Furthermore, investments have been made in programs, such as the Guarantee Programme of Agricultural Activities (Proagro), to protect farmers against risks, including adverse and variable weather and outbreaks of pests, weeds, and diseases. The government also uses the Rural Insurance Premium Subvention Programme (PSR) to help subsidize insurance premiums. In 2009, the program benefitted more than 56,000 producers (MAPA 2011), ensured financial resources of up to US\$6 billion, and provided coverage to 11 percent of total crop area.

Climate-Smart Approaches and a Reduced Environmental Footprint: Brazilian farmers are increasingly using climate-smart approaches for sustainable production, including “no-till” agriculture, which was pioneered in Brazil. In 1990 Brazilian farmers used no-till farming for 3 percent of their grains; today the process is used on more than 50 percent ([Economist 2010](#)). Additionally, since 2000, Brazilian farmers have steadily adopted more resource-efficient systems, such as integrated crop-livestock systems ([Martha 2010](#)). The government has provided credit facilities to allow the continuity of efficiency systems. The newly launched ABC programme (an acronym for low-carbon agriculture, in Portuguese) is a good example. ABC aims to mitigate GHG emissions, restore degraded lands, and better manage natural resources through practices aimed at improving production efficiency. The 2009 Brazilian Climate Change Law aims to recover millions of hectares of degraded land and improve millions more with integrated crop-livestock systems, no-till planting, biological nitrogen fixation, and planted forests. Overall, the government estimates that these actions will allow for an annual reduction of 166 million tons of CO₂-equivalent emissions from 2010 to 2020.

Economic growth and agricultural policies have opened up Brazil's forest frontier. Forests have been cleared to support soybean production and cattle ranching. Almost one-third of the Amazon forest has suffered degradation due to these activities as well as mining, logging, hydroelectricity generation, and infrastructure projects. Land tenure insecurity has also fueled deforestation. Landowners are clearing forests to protect their land rights, while the landless are clearing them to serve as proof of occupation and land development. Similar human and development pressures in the *Pantanal* (wetlands) and *Cerrado* are contributing to deforestation ([USAID 2011](#)).

Profitability: By improving efficiency and expanding agricultural production, Brazil has been able to drastically increase profitability of the sector—agricultural value-added nearly doubled from 1995 to 2013 ([WDI 2015](#)). From 1997 to 2009, agricultural and agribusiness exports generated a surplus of US\$403 billion, contributing greatly to the Brazilian external account balance as well as to macroeconomic stability ([ESCAP 2012](#)).

However, with the rapid transformation of Brazilian agriculture, many small farmers remained outside of the benefits. Data from the 2006 agricultural census conducted by the Brazilian Institute of Geography and Statistics (IBGE) show a high concentration of gross income in a relatively small number of farms. Of the 4.4 million family farms, less than 1 percent (27,000) captured 51 percent of gross income, while the bottom 2.9 million obtained just 3 percent. The main reason for this concentration was the ability of some farms to adopt new technologies, which explained 68 percent of gross income growth in the period. Labor contributed 22 percent while land contributed only 10 percent of the variation. The big challenge for public policy is to stimulate the modernization of agricultural production for all small farmers (Alves and Contini 2014).

The *Plano Brasil Sem Miséria* (Brazil Without Extreme Poverty Plan), an extension of *Bolsa Família*, has helped rural farmers in the north and northeast regions of the country to increase their profitability through incentives, technical assistance, and price guarantees. The Plan functions in three ways: (1) the Incentive Program allows families to receive funds in installments in order to obtain inputs and equipment; (2) the Technical Assistance and Rural Extension Program provides guidance on production and management techniques; and (3) the Food Acquisition Programme (PAA) acquires food from poor rural farmers for a fair price, providing payment through an official banking system. *Brasil Sem Miséria* has so far provided technical assistance to 129,000 families and 82,000 poor families have sold their products to the PAA for a guaranteed price ([Government of Brazil 2011](#)), lifting 22 million out of extreme poverty in within the first two years of implementation ([Government of Brazil 2013](#)). Plans to expand *Brazil Sem Miséria* are anticipated to go beyond its primary goal of eradicating extreme poverty to include different dimensions of well-being ([Paes-Sousa 2013](#)).

Finance: In line with the development of both export-oriented agribusiness and smallholder family farming, financial services delivery has developed over time. Brazil now sees a range of commercial banks, cooperative banking networks, leasing companies, dedicated boutique lenders and investors, and development banks providing services to supply chain actors, including inputs financing, long-term investment finance, equity participations, and trade and commodity finance. The segmentation in Brazilian agriculture is well-reflected in the business models of these financiers through “rural banking” and equipment lease for large-scale farmers and through cooperatives and regional banks for medium- and small-scale producers ([IFC 2012](#)).

In the 1990s, Brazil eliminated most of the prevailing market intervention, inputs, and interest rate subsidies. In place of these mechanisms, the Brazilian Development Bank refinances agricultural loans against low interest rates. Credit delivery is largely privatized. Brazilian legislation, as one of a few in the world, offers the opportunity to trade “farm product bonds” (Cedula de Produto Rural) on future crops or pledge these as collateral to a financier of input loans. This has enabled the development of supply chain finance products, which is the structuring of finance based on the organization and inherent cash flows between supply chain partners.

To expand access of family farms to productive inputs, PRONAF, managed by the Ministry of Agrarian Development, provides credit to family farmers through public-sector banks. Despite these important efforts, family farmers in Brazil remain inadequately represented in credit markets—only about 25 percent of available credit reach these small-scale farmers ([IPC-IG/WFP 2013](#)).

Transparency: While bribery and influence peddling still exist, the country has taken steps to increase transparency and reduce corruption: the Clean Company Act makes corporations liable for corruption at home and abroad, and the Brazilian legal system upheld guilty verdicts for corrupt politicians in the 2012 *Mensalao* scandal and the *Petrolao* scandal in 2014–2015. The latter continues to contribute to political and economic instability, which can affect economic growth going forward.

Land Tenure: The Constitution guarantees the inviolable right of property for women and men ([Government of Brazil 2010](#)). The property rights framework governing rural land rights consists of several laws. The 1964 Land Statute governs rural lands and redistributive land reform programs, and improves the rights of tenants and sharecroppers, and the 1966 Law No. 4947 establishes and governs agrarian reform ([USAID 2011](#)). Legal reforms in 1996 simplified expropriation procedures and increased taxes on idle lands to accelerate reform by encouraging voluntary sale to landless farmers ([Silveira 2008](#)). And in support of smallholder

family farms, the 2006 National Family Farming Act allows family farmers to register their farm ([Chmielewska 2010](#)). The legislation governing redistributive land reform, however, has suffered from serious limitations, such as allowing landowners to retain extremely high amounts of land ([Prosterman and Riedinger 1987](#)).

In the rural sector, land tenure is impacted by bifurcated government initiatives. On the one hand, the Ministry of Agriculture, Livestock and Food Supply (MAPA) largely promotes policies and programs supporting export-oriented agribusiness ([Rocha 2012](#)). Linked to MAPA, the Brazilian Research Corporation (Embrapa) generates knowledge and technology to advance Brazilian agriculture ([Embrapa 2015](#)). Embrapa is credited with increasing land under cultivation by one-third, mostly in the *Cerrado*, and with transforming soy into a tropical crop ([Economist 2010](#)). The Ministry of Agrarian Development (MAD) manages land reform and new rural settlements, supports smallholder family farming, and promotes food security and sustainable rural development. It also manages the Programme for Strengthening Family Agriculture (PRONAF) and the Food Acquisition Programme (PAA) mentioned above ([Rocha 2012](#)).

Brazil has one of most unequal distributions of land in the world ([Deininger 2003](#)). About 1 percent of the population owns 45 percent of all agricultural land, and nearly 5 million families are landless. Smallholder farmers lacking proof of formal ownership are being displaced by the spread of large-scale soy and sugar farms. After converting land to mechanized soy production, rural employment opportunities diminish, pushing the poor either to clear forests for new farmland or migrate to urban slums ([USAID 2011](#)). These pressures contribute to land tenure insecurity, food insecurity, and deforestation, and add to the pool of urban poor who become reliant on government social spending.

Important Actors in Brazil's Food System Transformation

The government of Brazil demonstrated early commitment to transforming its food system by investing in agricultural R&D. Embrapa—linked to the Ministry of Agriculture, Livestock and Food Supply—is responsible for the coordination of agricultural research, and the Ministry of Agrarian Development is leading rural technical assistance and extension services, which focus on family farming. Also at the federal level, rural universities are responsible for training human resources and researchers. At the state level, 16 research organizations engage in regional research. Embrapa operates in all Brazilian regions with 46 research centers, more than 2,000 researchers, and an annual budget of nearly US\$1 billion (OECD 2014).

Important also for agricultural development is the official credit system, provided through the Banco de Brazil, to invest in higher agricultural education, create bonds for supporting long-term investment, and invest in basic infrastructure, such as ports and roads.

The private sector has been critical in advancing Brazil's food system transformation as well. For example, Nestlé helped strengthen the milk value chain by providing technical assistance and advice to dairy farmers in milk-sourcing districts and engaging in contract farming for cereals and vegetables. Significant improvements in quantity and quality of yields, as well as higher incomes, have been observed. The company has also promoted good nutrition to schoolchildren through *Nutrir*, its food education program that aims to prevent malnutrition among children and adolescents of Brazil's lower-income families.

Public-private partnerships have also been key. Embrapa, for example, has worked with the private sector to develop improved soybean varieties for local growers, and the Global Alliance for Improved Nutrition (GAIN) and the Program for Appropriate Technology in Health (PATH) have partnered with a private rice company to produce fortified rice brands and make them available at grocery store chains.

Key Ingredients and Incentives to the Transformation

Investments in agricultural R&D were critical in transforming Brazil's food sector. Such investments were forward thinking, in that they were made in the early 1970s and did not fully mature until decades later. Additional policies that support farmers focus on providing rural credit and credit support, rural extension, marketing and income support, risk management, environmental stewardship, agricultural trade, and mechanisms to manage price volatility ([ESCAP 2012](#)).

The adoption of a large portfolio of technology and techniques helped spur innovations that transformed the *Cerrado* into productive agricultural land. The most important transformations were related to improvement of soil fertility, new plant varieties and hybrids, use of no-tillage systems, and, most recently, the integrated crop and livestock system ([Martha and Ferreira Filho 2012](#)). In the state of Mato Grosso, the double crop system means farmers cultivate soybeans (October to January) followed by maize (February to May).

Remaining Challenges and Opportunities

While Brazil has made impressive progress in transforming its food system and reducing hunger and undernutrition, certain challenges remain. For example, investments in agricultural R&D have improved efficiency, but public agricultural research provided through Embrapa appears to have had more influence on already-efficient farms, thereby widening the productivity gap between those farms and average producers ([USDA ERS 2012](#)). More broadly, Brazil can further improve its efficiency and profitability by reducing inequalities that hinder inclusive growth ([Facchini et al. 2014](#)). Despite progress, Brazil's Gini coefficient remains high, decreasing slightly

from 64 in 1991 to 53 in 2012, displaying the country's high level of income inequality ([World Bank 2014](#)).

To improve profitability and opportunities for farmers, particularly in the *Cerrado*, the Brazilian government must address poor roads and infrastructure that exacerbate transportation costs domestically. For example, it currently costs less to ship soybeans from a Brazilian port to China than it does to get the crop from farm to port.

Ensuring long-term reduction of inequalities that affect small family farmers will require greater efforts to increase participation from these farmers in modern food value chains. Stringent food safety standards in the United States and Europe exclude small farmers from these export markets ([Reardon et al. 2009](#); [Lee, Gereffi and Beauvais 2010](#)). Small farmers have also been excluded from supply chains due to consolidation of retail and processing segments of major agricultural value chains (World Bank 2001; Farina et al. 2005). It is promising that the government, under the National Food and Nutrition Security System (SISAN), is utilizing a formal mechanism—the National Council on Food and Nutrition Security (CONSEA)—to engage with civil society organizations that are working toward achieving a more inclusive food system ([Leao and Maluf 2012](#); Government of Brazil 2013).

Brazil is now challenged by rising overweight and obesity. The transformation of the food system and related trends (such as urbanized lifestyles) have prompted an increase in consumption of processed, fatty, sugary, and salty foods and a decrease in consumption of nutritious foods, such as beans, fruits, and vegetables ([Campos et al. 2013](#)). The effects of this dietary transition have manifested as increases in overweight and obesity. Currently, nearly 20 percent of Brazilian adults are obese ([Ng et al. 2014](#)). Increasing prevalence of overweight and obesity has been a major concern of the Brazilian government, but opportunities to effectively tackle this challenge need to be further exploited. An intergovernmental, multisectoral approach will be particularly beneficial ([Jaime et al. 2013](#)).

Creating an enabling environment for more private sector investment is another area Brazil can improve upon. According to the World Bank's "Doing Business" ranking, Brazil ranks 24 out of 32 in the region. Improving overall conditions for doing business by easing the regulatory burden on businesses would encourage more private sector engagement, as would improving transparency. According to a 2009 poll, almost 70 percent of Brazilian private sector owners and managers identified corruption as a major constraint to business ([Transparency International 2012](#)).

Additional measures to focus on include: (a) enhancing the economy's capacity for development by continued modernization of labor regulations and better labor market insertion programs; (b) strengthening agricultural policy incentives for innovation by moving

away from distortive support to producers; and (c) strengthening direct incentives to innovation in food and agriculture by increasing Embrapa's capacity and flexibility to collaborate with other R&D providers domestically and abroad (OECD 2014).

Rwanda's Food System Transformation

Summary

Rwanda is making significant strides toward developing a sustainable food system. Centering initiatives on its flagship development program, Vision 2020, the government placed high priority on land tenure reforms, rural development, and agricultural investment. Vision 2020 also focuses on employing climate-smart and gender-sensitive approaches. Increasingly, the government is encouraging private sector involvement by reducing barriers to doing business, thus attracting foreign investors along the entire food value chain. Despite great progress, such as improving productivity of staple food production, undernutrition remains a big challenge that Rwanda must address in order to achieve food security and nutrition for all. Land tenure reforms present mixed results—despite increasing food production, the government's approach to land-use consolidation, regional crop specialization, and priority crops could prevent smallholders from using, managing, and benefiting from their land.

Background

Following the 1994 genocide, Rwanda has made substantial progress in advancing its economy and transforming its food system. The country has made considerable headway focusing on national development. The economy improved greatly between 1995 and 2013, as GDP has grown an average of 9 percent per year. The national poverty rate dropped from 57 percent in 2005–2006 to 45 percent in 2010–2011, and the poorest 40 percent of the population experienced more rapid income increase on average than the rest of the population (Diao 2014). At the same time, agriculture has been recognized as key to the country's transformation. Rwanda committed to the Comprehensive Africa Agriculture Development Programme (CAADP) in 2007.¹ Since then, the country has been able to meet the CAADP target of allocating 10 percent of government budget to agriculture in 2010, with 7 percent annual agricultural growth in the same year ([ASTI 2011](#)). The country has embarked on the second phase of the CAADP agreement, aligning national agriculture strategies to the Malabo declaration.

A vital component to the transformation of Rwanda's food system was the government's long-term national strategy—Vision 2020—launched in 2000. The strategy focuses on advancing Rwanda to a knowledge-based economy and rising to middle income status by 2020. This

¹ African governments in 2003 pledged in Maputo to allocate at least 10 percent of their national budgets to agriculture to boost sectoral growth by 6 percent per year, under the CAADP agenda. In 2014, African leaders in Malabo committed to enhancing investment finance in agriculture, in addition to other commitments. See [Maputo Declaration](#) and [Malabo Declaration](#).

includes transforming Rwandan agriculture and improving smallholder profitability through a market-oriented approach. Both Vision 2020 and the 2002 Poverty Reduction Strategy identified land reform as a priority. In 2011, the National Strategy for Climate Change and Low Carbon Development was introduced to complement Vision 2020. The strategy emphasized sustainable, climate-smart, and gender-sensitive approaches for a low-carbon economy by 2050. To support this strategy, public and private investments and international collaborations have increased. In addition, the government has invested in comprehensive land regularization and land use consolidation that centrally features regional crop specialization and crop intensification centered on priority crops under the Ministry of Agriculture and Animal Resource's (MINAGRI) Crop Intensification Program. It has also invested in agricultural subsidies for seed and fertilizer for priority crops in addition to irrigation, land improvement, and soil and water conservation approaches. While the country is heavily dependent on international aid, government reforms to promote private sector participation have made Rwanda one of the best places to do business in Africa.

The country has made great strides to reduce hunger and undernutrition, as prevalence of hunger decreased from more than 50 percent to just over 30 percent in 24 years (1990–2014), and prevalence of undernutrition showed improvements in just over a decade. To signal their commitment to improving nutrition, Rwanda committed to the Scaling Up Nutrition (SUN) movement in 2011, and launched a consumer awareness campaign toward tackling the country's prevalence of undernutrition.

Questions remain about the Rwandan approach of promoting smallholder farming in the context of government-led land use consolidation, regional crop specialization, and crop intensification centered on six priority crops. Although in recent years there have been impressive gains in agriculture yields and food security indicators, it is difficult to ascertain whether this is attributable to positive land tenure reforms, heavy agricultural subsidies, or government-led agricultural interventions.

How Rwanda Transformed its Food System

Productivity: Rwandan agriculture is predominantly subsistence level, but cash crop production of coffee, tea, and other crops is growing. Tea yields, for example, doubled from 1995 to 2013. Food crop yields escalated—roots and tubers, for example, doubled in yield from 1995 to 2013. Similarly, plantain, a main component in the Rwandan diet, increased in yield by 35 percent in the same time period ([FAOSTAT 2015](#)), covering one-third of land area; plantains are no longer imported. Almost three-quarters of the population were employed in agriculture, and labor productivity has improved from 1980 to 2010, at an annual average growth rate of 2.7 percent,

compared to 2.2 percent in Angola for the same time period. This makes Rwanda one of the fastest growing African economies ([Benin et al. 2011](#)).

Nutrition: Although hunger and undernutrition are still big challenges in Rwanda, the prevalence of hunger decreased from 56 percent to 32 percent from 1990 to 2015 ([FAO 2014](#)). In the first half of the 1990s, 24 percent of children under five were underweight; by 2005–2011, that figure dropped to 18 percent ([FAOSTAT 2013](#)). The government aims to improve nutrition through multisectoral approaches under the Ministry of Health’s National Multisectoral Strategy to Eliminate Malnutrition (2010–2013) and the Joint Action Plan in the office of the president ([SUN 2015](#)). In 2012, the government released iron-rich bean varieties bred by the Rwandan Agriculture Board and the International Center for Tropical Agriculture, distributed by IFPRI’s HarvestPlus.

Resilience: Rwanda is susceptible to floods and droughts. Disaster risk reduction has taken top priority in the Economic Development and Poverty Reduction Strategy, cutting across all ministries ([UNDP 2012](#)). Several weather-indexed insurance schemes exist to protect farmers against extreme weather events. The Agriculture and Climate Risk Enterprise (ACRE)/Syngenta Foundation for Sustainable Agriculture, a public-private partnership, provides weather insurance to over 100,000 Rwandan farmers. In 2012, 1,600 insured farmers received their first payouts, and in 2014 more than 7,000 farmers received payouts. Together with the Rwandan insurer SORAS and Swiss Re Corporate Solutions, the program is the largest to offer agricultural insurance in Africa and the first to reach smallholders using mobile technology ([Syngenta 2015](#); [IFC 2015](#)).

Climate-Smart Approaches and Reduced Environmental Footprint: In 2011, the government released a strategic document, *Green Growth and Climate Resilience: National Strategy for Climate Change and Low Carbon Development*, which aimed to develop the economy with improved resilience and climate-sensitive approaches. Pathways to reshape agriculture include expanding crop varieties, implementing sustainable intensification methods and techniques, as well as educating women and girls ([Government of Rwanda 2011](#)). In 2014, an environmental and climate change fund was established, known as FONERWA. The Fund supports public and private projects by providing technical and financial assistance to promote green growth over the next 50 years. To date, FONERWA has funded seven projects that include 400 hectares of progressively constructed terraces ([FONERWA 2015](#)). The government of Rwanda and IFAD are working together on climate-smart post-harvest handling. The Climate Resilient Postharvest and Agribusiness Support Project aims to reach over 32,000 households ([IFAD 2014](#)), representing about 2 percent of all rural households. Launched in 2014, the initiative will ensure access to skills, knowledge and infrastructure for better post-harvest handling in response to climate risks at the post-production stage ([UNCC 2014](#)).

Profitability: Rwanda's agricultural value of production more than tripled from 1995 to 2013. The Rwanda Development Board introduced the "food-basket approach" in 2011 to improve smallholder profitability and accelerate growth in the agriculture sector. Context-specific agricultural investment opportunities in six regional food baskets were identified during Grow Africa ([Hope Magazine 2012](#)). Agricultural cooperatives have also been established to improve smallholder profitability by providing equipment, storage facilities, and technical assistance in post-harvest handling with support from , for example, the [World Food Programme](#). Additionally, agribusiness is growing with the help of new technologies, such as a new smart phone application that assists fertilizer traders to record supplies and sales from all customers ([New Times 2014](#)).

Transparency: According to Transparency International, Rwanda was among the least corrupt countries in Africa in 2013 and 2014 ([Transparency International 2014](#)). Rwanda has been identified as one of the best places to do business in Africa ([World Bank 2013](#)). In agriculture, this has created business opportunities along the value chain. At the input phase, the government encourages investment in the fertilizer business ([Rwanda Development Board n.d.](#)). In processing, for example, Japanese investors have expressed interest in producing high-value Rwandan products ([Ministry of Agriculture 2014](#)).

Land Tenure: The 2004 National Land Policy (NLP), the 2005 Organic Land Law Determining the Use and Management of Land (Land Law), and the 2007 National Land Tenure Regularization Program (NLTRP) have together improved land tenure security, although the NLP advocates a worrisome restriction on transfers of parcels smaller than 1 hectare. The NLTRP formalized customary rights and issued fully transferable, long-term leases, resulting in the registration of more than 10 million parcels and issuance of about 8 million leases ([Huggins 2014](#)).

While the Land Law and NLTRP have been successful in agricultural reform approach, the strategy is much broader ([Huggins 2014](#)). The 2004 Strategic Plan for Agricultural Transformation creates production system incentives to promote modernization, market orientation, crop intensification, professionalization, and private sector involvement. Regional crop specialization policies also aim to improve market linkages ([Huggins 2014](#)).

MINAGRI's Crop Intensification Program (CIP), launched nationwide in 2007, prioritizes land use consolidation and regional crop specialization. The program determines which land will change from agricultural production based on intercropping of diverse crops to mono-cropping of eight priority crops ([Huggins 2014](#)). The eight priority crops include maize, rice, wheat, Irish potato, cassava, and beans ([MINAGRI 2015](#)). In targeted land use consolidation areas, the CIP has farmers of adjacent plots grow a single crop under a unified schedule. Such farmers benefit from CIP's heavy promotion of subsidized seeds and chemical fertilizers, in addition to

extension and technical services ([Huggins 2014](#)). The process was designed to ensure no farmer was left behind—for a country that is highly fragmented, this led to critical outcomes. At the district- and household-level, efforts are geared to meet targets (such as hectares under priority crop production) that work toward national production targets (MINAGRI/[Kathiresan 2012](#); [Huggins 2014](#)).

The Rwanda experience presents a mixed picture. Although land tenure reforms had positive links to food security, in some instances increasing regulation over certain rights to land—especially through the CIP’s implementation of land use consolidation—may be compromising farmers’ rights to use, benefit from, and manage their land ([Huggins 2014, citing Pritchard 2013](#); Newbury 2011; [Ansoms 2009](#); [Huggins, 2009](#); [Ingelaere 2007](#)). Still others report that projects supporting the Strategic Plan for Agricultural Transformation in other areas promote kitchen gardens alongside priority crops to offset risks and ensure food security ([IFAD 2011](#)), and cooperative membership and production is concluded to be voluntary ([Verhofstadt and Maertens 2013](#)).

Important Actors in Rwanda’s Food System Transformation

Following the genocide, the government prioritized economic development and devised strategic reforms for Rwanda’s future. Significantly, it prioritized land, rural development, and agricultural transformation. In particular, MINAGRI and the Rwanda Development Authority (RADA) has played a principal role in their management of agricultural land use consolidation and regional crop specialization as a means to improve land management and increase productivity ([Bledsoe et al. 2007](#)).

The Rwandan government has also been keen on creating a conducive business environment with assistance from the international community. For example, the World Bank Group’s Rwanda Investment Climate Reform Program provided support to the Rwandan government’s legal, regulatory, and institutional reforms, removing unnecessary barriers to doing business. Further, Rwanda’s Special Economic Zones have attracted investors, particularly in the agriculture sector, by offering regulatory incentives and the necessary infrastructure for agro-processing, including roads, energy, water, and information and communication technologies (ICTs). These investments have significant value; between 2000 and 2013, the value of registered private investments in Rwandan agriculture totaled US\$512 million across 184 projects ([Grow Africa 2014](#)).

Public-private partnerships have been important in boosting the supply chain for nutrition. Under the Ministry of Health’s Nutrition Technical Working Group, industries and consumer associations have established the National Food Fortification Alliance. The alliance is a platform

for decision-making and has developed national fortification standards that have been harmonized with the East African community.

Donor assistance has been instrumental to many of Rwanda's reforms. In 2011, 50 percent of the national budget came from donor funding ([Cooke 2011](#)). The World Bank, the United Nations, and the governments of Japan, the United Kingdom, the United States, and Sweden provided critical funding in education, nutrition, agriculture, and rural development.

Key Ingredients and Incentives to the Transformation

Strong public investment is a major influence on Rwanda's food system development. Through cooperative development support, the government facilitated access to inputs, increased livestock herds, and social capital. It also encouraged off-farm employment where appropriate, which played a pivotal role in sustaining agricultural growth ([IFAD 2014](#)). Land tenure reforms and strategic support of agricultural production and marketing cooperatives provided key platforms for land tenure security and agricultural productivity. Additionally, reducing the gender gap by allowing women to hold positions of authority in all sectors, and education for women and girls has been recognized as a key pathway to improve the agriculture sector.

Long-term development is another component to Rwanda's growth. The second Economic Development and Poverty Reduction Strategy is a medium-term strategy that centers on reducing poverty and advancing growth. The government has instilled a culture of delivery and accountability for its ministers and managers, including an annual "delivery contract." This approach has a significant impact on the performance of government programs and project implementation.

Remaining Challenges and Opportunities

Rwanda has made impressive strides, but it still has much to do, especially to improve its food system for better nutrition. Prevalence of child stunting is high, affecting 44 percent of children under age 5 in 2010. Further, nutritional disparities exist across regions. Stunting rates are higher than 60 percent in the northern and western regions that border Lake Kivu and the Congo Nile Crest ([WFP 2015](#)). The value of foods to meet nutritional needs is greatly influenced by access to clean water and sanitation as infectious diseases alter the ability to absorb and utilize nutrients—ensuring improved access to water and better sanitation and hygiene practices (WASH) are areas that require attention. Government data suggest that 72 percent of the population has access to water and 45 percent to adequate sanitation (Water Supply and Sanitation in Rwanda 2011).

Along with better WASH infrastructure, expanding social safety net programs, which currently focus on reducing poverty, as well as other nutrition-sensitive interventions, could also offer big improvements to the country's nutrition and health. Implementing better-targeted, productive, and cross-sectoral social protection programs could help Rwandans grow more resilient to shocks.

Several opportunities exist to improve the country's land tenure laws, which could then improve agricultural production and the overall food system. Countrywide research is needed to understand whether Rwanda's land tenure and agriculture reform approach is a success not only in terms of recent agricultural productivity gains but also long-term agricultural growth, land tenure security, and food security. Research should evaluate specifically which parts of the national reform approach are most effective and what the social costs of the reforms are. Participation in production cooperatives should be incontrovertibly voluntary. Local authorities must be trained and incentivized to implement land use consolidation in ways that respect farmers' property rights, including right to use, benefit, and manage. Farmers should be able to transfer small plots, and should have freedom to choose what crops to grow. The CIP provides immense support to collectives producing certain mono-crops, however, evaluating how widely accessible these benefits are is imperative. Broad-based gains in agricultural productivity, economic growth, and food security will require that all small farmers, not just select farmers producing favored crops, can access inputs, extension services, and other resources.

While Rwanda has set the foundation for much of its capacity strengthening processes, more advances could accelerate progress in policy-making. Investments in agricultural R&D, such as higher education in agricultural studies, are still lacking in Rwandan universities and are highly dependent on donor and development bank funding ([ASTI 2011](#)).

Despite the ease of doing business, the role of the private sector could be enhanced through improved infrastructure. Better roads and electricity supply, for example, could promote more formal private sector participation in the country ([World Bank 2014](#)).

Vietnam's Food System Transformation

Summary

By successfully implementing a series of land tenure and market reforms, Vietnam has vastly transformed its food system. In particular, innovative policies and technologies have improved the rice and coffee sectors, and the country is among the world's largest exporters of both commodities. The government pursued smallholder agriculture-led growth with nutrition-sensitive approaches, which led to drastic reductions in hunger and undernutrition.

Engagement with the private sector, including public-private partnerships, has been important for improving nutrition via supplementation and fortification initiatives, and for promoting climate-smart approaches. Vietnam can continue to transform its food system to promote inclusive growth, food security, and nutrition through improvements in rural infrastructure and basic services, effective social safety nets that focus on nutrition, and a more transparent environment for doing business.

Background

Vietnam has made significant progress in transforming its food system and overall economy. It went from a country that suffered food shortages to one of the largest rice exporters in the world. The change from a centrally planned economy to economic liberalization set the pace for further transformation of the country's food system.

The key economic policy reforms, known as the *Doi Moi*, were introduced in the late 1980s. They consisted of four main elements: (1) equitable land reform; (2) liberalization of agricultural marketing and trade; (3) pragmatic and sequenced liberalization for attracting and benefiting from foreign direct investment; and (4) sustained investment in human development ([Vandemoortele and Bird 2011](#)). The reforms helped spur economic success, as the country grew at an average annual rate of 6.6 percent from 1986 to 2013. Broad-based land distribution has contributed to the decrease in the poverty headcount from 58 percent in 1992–1993 to 37 percent in 1997–1998. According to Vietnam's *Living Standards Survey* of rural households, average annual per capita expenditures increased by 6 percent and levels of formal education increased from four years to seven years between 1993 and 1998 ([Deininger and Jin 2003](#)).

Land reforms in support of smallholder agriculture dating back to the late 1960s (with modifications from intervening decades) were essential to the transformation of Vietnam's food system. The implementation of Resolution 10 of the 1988 Land Law—which recognized the household, instead of the collective, as the basic production unit of the rural economy—drastically improved agricultural incentives ([World Bank 2012](#)). The 1993 Land Law allowed for

the issuance of land use certificates to all rural households, thereby enabling them to inherit, transfer, exchange, lease, and mortgage their land rights ([Klump 2007](#)). These reforms played a critical role in enhancing agricultural growth in the 1990s, which contributed to higher rural incomes and to the movement of labor into non-agricultural sectors.

Within Vietnam's context of economic liberalization, changing patterns of food demand, increased urbanization, and greater wealth have contributed to transformation of the food system from the demand side. Modern, high-value supply chains are expanding and supermarkets are gaining market share from traditional-based markets. Vietnam is one in a group of Asian countries where growth of supermarket sales are at 30–50 percent per year ([Reardon and Gulati 2008](#)). Upgrading traditional food retailers for better hygiene and food safety has been a government priority, particularly in remote and low-income regions ([USDA 2013](#)).

How Vietnam Transformed its Food System

Productivity: Much of the growth in the agricultural sector centered on improving the productivity and production of rice, which accounts for more than 50 percent of daily caloric intake in Vietnam ([FAOSTAT](#)). Between 1980 and 2013, rice paddy yields more than doubled while production nearly tripled ([FAOSTAT](#)). The government's commitment to family farming and universally documented land rights helped agricultural production gain apace ([Deininger and Jin 2003](#)). Rice production per hectare, for example, is now 71 percent higher than that of Pakistan, 56 percent higher than India, and 23 percent higher than Bangladesh ([FAOSTAT 2013](#)). Driving much of these gains was the introduction of improved rice varieties by the International Rice Research Institute (IRRI) and local partners. The IR8 variety resulted in significant changes in the 1960s in not only yield but also the cropping system, as it enabled the growing of two crops a year via shorter-duration traits ([ACIAR 2011](#)).

Vietnam has become the world's largest coffee producer after Brazil. From 1986 to 2013, coffee production increased by a factor of 58 ([FAOSTAT 2013](#)). Along with the aforementioned reforms, foreign investment in production and trading of coffee in Vietnam helped spur the rapid development of the coffee industry. Coffee is now the second largest export earning crop in Vietnam supporting the livelihoods of 2 million people.

Nutrition: Success in reducing hunger and undernutrition in Vietnam was likely largely driven by growth in agriculture, complemented by targeted nutrition and health programs ([IFPRI 2013](#)). Policies that supported pro-poor land-use and increased investment in nutrition and health programs contributed to increasing rural incomes. Between 1990 and 2013, the prevalence of undernourishment fell substantially from 46 to 13 percent ([FAO 2014](#)). While child stunting is

still prevalent, its rapid reduction from 61 percent in 1988 to 23 percent in 2010 ([FAO 2013](#)) is a strong sign of progress. The infant mortality rate, a broad measure with substantial links to nutrition, has plunged, from 59 per 1,000 live births in 1984 to 16 per 1,000 in 2013 ([Index Mundi 2015](#); [Population Reference Bureau 2013](#)).

In the 1990s, the government increased public expenditure targeted at improving nutrition and health outcomes to help ensure food security and nutrition in the country. They also implemented a comprehensive nutrition policy to improve dietary diversity and programs to increase micronutrient supplementation. In addition, they pursued nutrition-sensitive approaches as the government established child health and family planning programs, maintained national health coverage, and provided health subsidies to poor people ([von Braun et al. 2008](#)). In 2014, Vietnam joined the Scaling Up Nutrition movement to prioritize efforts to address undernutrition with collaboration from various stakeholders.

Resilience: Vietnam is prone to natural disasters and ranked the sixth most vulnerable country to extreme weather events ([Vu, Holland and Cassells 2014](#)). Flood management systems have been put in place for decades, such as river and sea dyke systems, as well as reservoirs for flood control, water regulation, and power generation in major river catchments, including the Red and Mekong Rivers ([Give2Asia n.d.](#)). The government piloted agricultural insurance in 21 provinces from 2011 to 2013 to protect farmers against disaster risk. More than 316,000 farmers involved in rice, livestock, and aquaculture were insured, and the pilot was extended to mid-2014 ([Tran 2014](#)). Aid-funded projects to improve coastal community resilience have been initiated, including the SNV-led program to provide weather risk insurance, improve forest management near the coastline, and improve the income and adaptive capacity of coastal households ([SNV 2013](#)).

Climate-Smart Approaches and Reduced Environmental Footprint: Vietnam is highly susceptible to climate change events due to its tropical location, long coastline, and mega-deltas. Nestlé and its partners in the Coffee Water Footprint Public-Private Partnership, including the Swiss Agency for Development and Cooperation (SIDA), identified best practices to scale up coffee production, which resulted in recommendations on how to reduce water usage by more than 50 percent. A new phase of the project, which aims to reach an additional 50,000 marginalized and mostly poor farmers in five different Vietnamese provinces over the next five years, has been approved (Nestlé 2014). Similarly, the CGIAR has introduced climate-smart methods such as alternate wetting and drying techniques that have not only increased yields, but reduced use of seed, water, and fertilizer ([World Bank 2014](#)).

Internationally, Vietnam co-leads the Action Group on Enabling Environment, together with South Africa and the Netherlands. The group assesses needs to scale up climate-smart

agriculture through policy and an institutional enabling environment. It promotes the harmonization of national agriculture, climate change, and food system policies ([FAO 2015](#)).

Profitability: The value of Vietnam’s agricultural production increased by a factor of 2.6 from 1986 to 2013 ([WDI 2015](#)). Much of this value is captured in the export market, which increased 14-fold from 1995 to 2013 ([UNCTAD 2015](#)). Rice trade more than doubled from the 1980s to the mid-1990s, when about 3 million tons were exported ([Anh and Sautier 2011](#)). There has been vast diversification into higher value crops, as secure small farmers invest in their land ([Kirk and Tuan 2009](#)). From 1995 to 2013, the value of coffee, tea, cocoa, and spice exports increased ten-fold ([UNCTAD 2015](#)).

Finance: Vietnam has made efforts to reform its highly subsidized agricultural credit system by splitting its government-owned bank into the Vietnam Bank for Social Policies, which is a dedicated vehicle for policy lending, and the Vietnam Bank for Agriculture and Rural Development, which lends on commercial terms to economically viable lenders. Aside from credit delivery by these government-owned banks, Vietnam has a range of commercial banks and cooperatives (known as the “Peoples’ Credit System”) that provide banking products to the agriculture sector.

Transparency: According to Transparency International, Vietnam ranks at the lower end of cleanest countries, at 119 out of 175. Still, the government has taken steps to address governance and corruption challenges. For example, in 2005, they enacted the Anti-Corruption Law, which criminalizes several types of corruption, establishes asset disclosure requirements for governmental officials, and whistle-blower protection. However, corruption is still widespread throughout the country, and the private sector also deals with burdensome legislation, which provides both incentives and opportunities for more corruption ([Transparency International 2014](#)).

Land Tenure: Vietnam’s land tenure reforms—some dating back to the late 1960s, with extensions and modifications made in intervening decades—have helped establish vibrant smallholder farms that produce both food crops for domestic consumption and a variety of crops for export. Decollectivization and land titling have created robust incentives to invest in agricultural land improvements and are positively linked to successes in agricultural productivity and food security ([Kirk and Tuan 2009](#)).

Vietnam should be viewed as one of the five great Asian success stories in land tenure reform, joining China, Japan, South Korea, and Taiwan. Like China, Vietnam reached that point after unsuccessful efforts to rely on large-scale collective farming. Similar to the other four countries, pre-reform Vietnam’s agriculture had largely depended on a system of tenant farming, in which the tenants—who had virtually no security of tenure and were in an inferior position to bargain

on rent levels—had little incentive to make land improvements needed for major increases in production ([Prosterman et al. 2009](#)).

In the midst of war, a major land-to-the-tiller reform was carried out in 1969–1973, giving 1 million tenant farm families in South Vietnam full documented ownership of small farms. Consequently, rice production increased by 30 percent even during the war. In newly unified post-1975 Vietnam, the government first attempted to collectivize agriculture in the southern region, but retreated in the face of farmer opposition. In the wake of China breaking up its collective farms in 1979, the Vietnamese government broke up all collective farms into small family farms, in part because the south had higher yields from small family farms than the north had from its collective farms ([Prosterman et al. 2009](#)). Specifically, the government used Resolution 10 of the 1988 Land Law to provide rural households with nontransferable control rights to rent land for a 10- to 15-year term ([Do and Iyer 2007](#)).

The 1993 Land Law extended lease terms to 20 years for annual croplands and 50 years for perennial croplands. It also permitted the right to inherit, transfer, exchange, lease, and mortgage land rights. The land titling program issued 11 million land titles to rural households by 2001. Expanded land rights and more secure land tenure have reduced the likelihood of state expropriation, incentivized long-term investments, and generated increases in the total area devoted to long-term crops ([Do and Iyer 2007](#)). They have also helped stimulate rental and sales markets, positively influencing productivity ([Deininger and Jin 2003](#)).

Important Actors in Vietnam’s Food System Transformation

The government of Vietnam played a critical role in overseeing and implementing land tenure reforms, market liberalization, and investing in human development. They were aided by several key players: policy advisors, such as Landesa, influenced the land-to-the-tiller law in the early 1970s. Additionally, research institutions such as IFPRI and IRRI helped advance innovations in policy and technology that contributed to increased productivity and profitability of the food system.

The private sector also played a key role. For example, Nestlé has worked to improve and promote water use efficiency, sustainable intensification, and climate-smart approaches for smallholders. The liberalization of Vietnam’s economy set the tone for increased foreign investments that helped bolster sectors, including coffee production, to become a world leader in exports. Donors such as SNV and others have been critical to helping smallholders build resilience to climate change. Partnerships such as the one between the Global Alliance for Improved Nutrition (GAIN) and the Vietnamese National Institute of Nutrition and other agencies have provided micronutrient supplementation and supported fortification of fish

sauce and vegetable oils in Vietnam. Further, the Nutrition Cluster Group is a multistakeholder platform that works toward setting nutrition priorities and objectives in the country. Meetings are held with representatives across ministries, universities, United Nations agencies, foundations, and global initiatives ([SUN 2013](#)).

Key Ingredients and Incentives to the Transformation

Vietnam successfully integrated land reform policies that incentivized smallholders to increase production and productivity of staple crops while also diversifying to higher value crops. Additionally, innovations in policies and technologies had significant roles in transforming Vietnam from a net importer to one of the largest exporters of rice. Another key ingredient was the government's willingness to use evidence-based policy research to guide their decisions, including the liberalization of their rice sector, which became a boon for domestic and international markets. Using research from IFPRI, Vietnam rolled out a series of reforms, including relaxing restrictions on internal rice movement and rice exports, providing targeted food security assistance instead of price supports, and increasing investment in agricultural R&D ([IFPRI 1997](#)).

Remaining Challenges and Opportunities

Despite impressive transformations in the food system in Vietnam, there is room for improvement. More inclusive growth can be further promoted through important measures, such as improved access to markets, rural infrastructure, basic services, and further development of the private sector both within and outside of agriculture ([Klump 2007](#)). Effective social protection policies and greater transparency will be crucial as Vietnam continues to experience economic transformation ([IFPRI 2013](#)).

Vietnam achieved the Millennium Development Goal of halving hunger from 1990 to 2015 ([FAO 2015](#)). But more than 10 million people in Vietnam are still hungry. While impressive reductions in child stunting occurred from 1988 to 2010, more than 1 million (23 percent) of children under 5 years old were stunted in 2011. Vietnam can accelerate the pace toward eliminating hunger and malnutrition through well-targeted nutrition interventions that address both the immediate causes of undernutrition (through nutrition-specific interventions, such as micronutrient supplementation) and its underlying causes (through nutrition-sensitive programs, such as early childhood development and investing in rural WASH infrastructure). To stave off the potential rise in overweight and obesity seen in countries on similar development paths, integrating nutrition into its agriculture-led growth strategy through policies that promote the production of nutrient-rich crops would also improve nutrition in Vietnam.

While land tenure reforms have led to transfer of land, increased efficiency, and accelerated productivity, poor rural farmers are at risk of selling their land during emergencies. Consequently, landlessness must be monitored ([Kirk and Tuan 2009](#)). Although secure land rights have supported farmer investment in environmentally sensitive practices, such as agroforestry and anti-erosion methods, it may also place wetlands and other fragile ecosystems at risk of being transformed into farmland or aquaculture ([Kirk and Tuan 2009](#)). Continued efforts in water management of crops like coffee are essential to prevent water scarcity and ensure that the increase in yields can be maintained.

Additionally, improving governance and transparency can encourage participation in the food system from smallholders and the private sector. Corruption in land administration has been perceived to be among the most corrupt aspects of public life ([World Bank 2012](#)). Land disputes, for example, involving corrupt public officials have led to smallholder farmer dissatisfaction, including violent behavior ([Wall Street Journal 2013](#)). Tax loopholes in Vietnam's value-added tax payments and refunds for exportable goods reduce traceability, particularly for coffee. Unclear sourcing and tax dodging could discourage investment and purchasing of coffee by foreign firms, who could opt to deal with other South Asian countries that produce Robusta beans ([Reuters 2013](#)).

Conclusion

Brazil, Rwanda, and Vietnam implemented forward-thinking policies alongside concerted, multisectoral efforts that were crucial along the path to food system transformation in each country. While much success has been achieved, there is much more that can be done to elevate improvements in agriculture, food security, and nutrition in all three countries. Challenges and opportunities remain, which will require further innovation, collaboration, and inclusive partnerships to sustain improvements in the food system.

The role of the private sector, in particular, was instrumental for each country. Given the right economic incentives, the private sector can provide effective and sustainable investment, unique expertise, and innovation at a greater scale to help in the fight against hunger and poverty.

Alongside private sector involvement is the importance of collaboration from multiple stakeholders at the local and global levels. The World Economic Forum's New Vision for Agriculture initiative (NVA), for example, serves as a global platform to build collaboration among stakeholders to achieve a vision of agriculture as a driver of food security, environmental sustainability, and economic opportunity. The NVA engages over 450 organizations, including industry, government, civil society, farmers, and experts. It promotes country-led transformation through multistakeholder partnerships and market-based activity. It has catalyzed such efforts in 18 countries across Africa, Asia, and Latin America. Examples of this innovative partnership model are outlined below.

- In collaboration with the African Union, the New Partnership for Africa's Development (NEPAD) and the World Economic Forum, Grow Africa works to increase investment and partnership in African agriculture. More than 200 companies have made investment commitments in 12 participating countries, implementing more than US\$1.8 billion and engaging 8.7 million smallholder farmers
- In collaboration with the Association of Southeast Asian Nations (ASEAN) Secretariat and the Forum, Grow Asia enables multistakeholder collaboration to encourage sustainable and inclusive agricultural development in Southeast Asia, with national partnerships in Indonesia, Myanmar, the Philippines, and Vietnam working across more than 20 value chains and reaching more than 100,000 farmer
- The NVA India public-private partnership works to advance sustainable growth and development in Indian agriculture, including through the IAD partnership in the Maharashtra State, which engages more than half a million Indian farmers in 30 integrated value-chain projects

- In Mexico, the VIDA partnership focuses on five commodity value chains, driven by over 20 global and Mexican companies in partnership with the government and other key stakeholders

These case studies offer valuable lessons on both successful and unsuccessful approaches to food system transformation. They outline potential opportunities that can be tailored to other developing countries to make similar or even greater advancements in transforming their own food systems.