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SCALE OF INSTITUTIONAL PUBLIC PROCUREMENT OF FOOD IN BRAZIL[1]

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1 INTRODUCTION: THE RATIONALE FOR INSTITUTIONAL PROCUREMENT IN BRAZIL

A majority of people living in rural areas depend on agriculture for their livelihoods. Investing in smallholder farming can be a sustainable way to revitalise agricultural production based on local and diverse food systems. Inclusive agricultural growth has the potential to reduce rural poverty, mitigate the effects of volatile global food prices and boost the domestic economy (IPC-IG 2013).

A central component of Brazil's experience in promoting inclusive agricultural growth has been institutional public procurement with a focus on family farmers. Beginning in 2003, the Brazilian government launched the Zero Hunger strategy, which organised institutional public procurement as a tool to provide a stable market and price benchmarks for smallholder production. More broadly, the strategy was composed of 'structural policies' aimed at redistributing income, promoting smallholder production, generating employment and fostering agrarian reform with the goal of eradicating hunger and poverty (da Silva et al. 2011; da Silva et al. 2002).

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Family farm agriculture in Brazil currently represents 84.4 per cent of agricultural establishments,[6] provides 74 per cent of total rural employment and accounts for 33.2 per cent of agricultural Gross Domestic Product (GDP) (Bacha and Stege 2014). However, despite the prominence of family farming in Brazil, it only received 13.37 per cent of the government credit in the 2013/2014 *Plano Safra da Agricultura Familiar* (Seasonal Family Farming Plan).

This report analyses the Brazilian institutional public food procurement process, highlighting its main programmes and procedures, as well as new data that have recently been made available. It describes the two key institutional procurement programmes in the country, namely the Food Acquisition Programme (PAA) and the National School Feeding Programme (PNAE). Together they represent the largest forms of 'structured demand' for family farmers in Brazil. Originally coined by the Bill and Melinda Gates Foundation, 'structured demand' refers to the connection of small farmers to large, predictable sources of demand, which reduces production risks, allows producers to improve the quality of their products and leads to positive impacts on agricultural income and poverty reduction. In the Brazilian context, it refers to regular government purchases of agricultural products from family farmers up to a certain limit, with the aim of fostering their economic activity (IPC-IG 2013).

In addition, this report estimates the total scale of Brazilian government food procurement of agricultural produce, taking into account both its direct and indirect effects. Given that government institutions procure semi- or wholly processed foods, this report also estimates purchases from the food industry. It offers an estimate of the total food demand that could potentially benefit from better integration between family farming and the food industry.

This report comprises four sections, in addition to this introduction. The next section briefly describes the main characteristics of family farms and farmers in Brazil, based on the government definition of family farms, documenting their participation in total agricultural production. The third section describes the nature of institutional food procurement from family farmers through the PAA and PNAE programmes. The design of the PAA and the recent (2009) reforms of the PNAE have established a procurement quota to be spent exclusively with purchases from family farmers. The fourth section provides estimates of the scale of government food procurement. In the final section, this report discusses the policy implications of institutional procurement in Brazil and puts forward some suggestions on how to improve public procurement policies. Emphasis is placed on the importance of ensuring that family farmers are able to add value to their products—possibly via some basic food processing that could be carried out by cooperatives—as well as supporting their access to the food industry as suppliers.

2 FAMILY FARMERS IN BRAZIL

The Brazilian definition of what constitutes a family farm dates back to the 1960s, when 'family-owned properties' were first warranted some legal recognition.[7] However, the definition offered a limited classification of rural properties based mainly on the size of land. It was only in the 1990s[8] that the 'smallholder' definition became relevant to the design of policies aimed at supporting family farming (Delgado et al. 2013). The current legislation that defines family farming has evolved with the development of institutional public

procurement programmes and is based on *Lei No. 11.326/2006*, which defines a family farm according to the following characteristics:

- an establishment of rural economic activity below four fiscal modules (can vary between 20 hectares and 440 hectares depending on the local characteristics);[9]
- the majority of the labour used in the establishment originates from the owners' family;
- a minimum percentage of the family income is obtained from the plot of land (agriculture, fishing, harvesting, tourism etc.); and
- the establishment is managed by the family.

According to the Census of Agriculture for 2006, there are over 4 million family farms in Brazil, based on these characteristics. They represent 84 per cent of total rural establishments, at least half of them located in the Northeast region (2,187,131 establishments). The distribution of total rural establishments by region disaggregated by family farms and non-family farms and their average land area can be seen in Table 1. Family farms outnumbered non-family farms across all regions. There is a striking difference in average land size when comparing family farms with non-family farms; family farms span, on average, 18 hectares, while non-family farms span, on average, 313 hectares, reaching 955 hectares in the Centre-West region. Land ownership remains unequal: family farmers occupy 24.3 per cent of total agricultural land despite representing a considerably larger number of farms (IBGE 2006).

The family farm sector was responsible for 33.2 per cent of Brazil's gross agricultural production value in 2006. The most productive region for family farming was the South, responsible for 38.7 per cent of the gross agricultural product for this sector. Despite having more family farms than the other regions (including the South), the Northeast region was responsible for only 25 per cent of gross agricultural product (Bacha and Stege 2014).

TABLE 1

Number of establishments and average area (in hectares) of family farms in Brazil, 2006

	Family farms		Non-family farms	
	Establishments	Average land size (ha.)	Establishments	Average land size (ha.)
Brazil	4,366,267	18.3	809,369	313.3
North	412,666	40.3	63,112	616.8
Northeast	2,187,131	12.9	266,929	178.9
Southeast	699,755	18.3	222,342	189.6
South	849,693	15.4	156,510	183.5
Centre-West	217,022	43.1	100,476	955.5

Source: Census of Agriculture, IBGE (2006).

Although the majority of rural establishments in Brazil are family farms, the Ministry of Agrarian Development, which is the federal government agency responsible for agricultural policies targeting family farmers, announced a budget of BRL21 billion for family farming through the National Programme for the Strengthening of Family Farming (PRONAF) credit line for the

2013/14 crop year. According to government figures, this budget represents an increase of 400 per cent over 2003 figures (MDA 2013). However, it accounts for only 13.37 per cent of total rural credit. The Agricultural and Livestock Plan for 2013/2014 provided a budget of BRL136 billion in rural credit for agribusiness from the Ministry of Agriculture, Livestock and Food Supply, which is the federal government agency responsible for non-family farming (MAPA, 2013).

For family farms and their farmers to be able to participate in institutional public procurement programmes, such as those organised by the PAA and PNAE, they need to be included in a database by filling out a form, the 'Declaration of Aptitude (DAP) to the National Programme for the Strengthening of Family Farming (PRONAF)'. PRONAF is the aforementioned credit scheme, available exclusively to family farmers. The total number of family farmers with a registered DAP by region is shown in Table 2. PRONAF classifies farmers into four categories, which can be used to target the poorest and most vulnerable families among them. Groups 'A' and 'A/C' include agrarian reform settlers or agrarian credit beneficiaries (beneficiaries of the National Programme for Land Reform—PNRA—or the National Programme for Land Credit—PNCF). Group 'B' are those family farmers who are not in group A or A/C but whose annual gross income is below BRL20,000. The remaining group includes family farmers whose annual gross income is above BRL20,000 but below BRL360,000. The DAP also identifies specific populations such as indigenous populations, *quilombolas* (communities of descendants of Afro-Brazilian slaves), fisherfolk and gatherers (MDA/SAF Ordinance No. 26, 9 May 2014). These groups determine who is eligible for each type of credit line and which family farmers are to be prioritised by specific programmes.

As of 2013, there were 5,101,692 family farmers with a valid DAP number—an increase of 735,425 family farmers according to 2006 census data. Institutional public procurement programmes prioritise farmers with lower incomes, thus those in groups A, A/C and B are eligible. Out of those, 3,291,163 family farmers are in the targeted group for institutional food procurement programmes (A, A/C and B).

TABLE 2

Family farming establishments with a DAP, by group, 2014

	Group A		Group A/C		Group B		Others (C/D/E/V)	
Brazil	180,943	3.5%	37,556	0.7%	3,072,664	60.2%	1,810,529	35.5%
North	33,619	0.7%	3,656	0.1%	227,221	4.5%	234,070	4.6%
Northeast	107,244	2.1%	21,719	0.4%	2,516,995	49.3%	498,247	9.8%
Southeast	13,635	0.3%	5,096	0.1%	193,035	3.8%	383,639	7.5%
South	9,179	0.2%	1,794	0.0%	97,994	1.9%	591,401	11.6%
Centre West	17,266	0.3%	5,291	0.1%	37,419	0.7%	103,172	2.0%

Source: SAF/MDA (2014).

Despite the recent Brazilian experience of inclusive growth and poverty reduction, family farmers are still among the poorest population groups in the country. To estimate the level of poverty faced by family farmers in comparison to the total population, one has to rely on income data from the Brazilian Annual National Household Sample Survey (PNAD), which includes information on rural households (Del Grossi and Graziano Silva 2002). PNAD data do not allow for the identification of family farmers in the same way as the 2006 agricultural census, which applied the official definition of a family farm. However, one can compare

rural poverty with overall poverty, as well as the incidence of poverty in households in which the head declared agriculture as their main economic activity. This classification is quite broad, but it can nevertheless be used as a proxy for family farmers, as it includes the occupational category 'self-employed in agriculture, in animal husbandry or a forest extractive activity' as well as 'workers on their subsistence farms', though it also includes 'employees' and 'employers'.

BOX 1

The Declaration of Aptitude: an instrument to identify family farmers in Brazil

The DAP identifies each family rural production unit (UFPR). It is a unique number that identifies the head of the household and his/her spouse as co-signatories of the rural establishment. Enrolment is free of charge and linked to the municipality. PRONAF's registry utilises an online platform to collect information on farmers' income, land size, ethnicity and access to public policies regarding land reform and credit. The registry classifies family farmers and their organised groups (associations or cooperatives). At least 60 per cent of the participants in an organised family farmer group must have a valid DAP number. The DAP number can be issued by over 20 institutions, including federal agencies such as the National Institute of Colonisation and Agrarian Reform (INCRA) and non-government institutions. In 2014 there were 26,787 registered issuers throughout the country. The information collected in the DAP form is valid for up to three years. The DAP is regulated and managed by the Secretariat of Family Farming of the MDA (MDA 2014).

Table 3 shows the evolution of poverty in Brazil (total population) as well as the poverty incidence for the rural population and for households in which the head's primary economic activity is agriculture. 'Rural population' refers to households in rural areas according to the PNAD classification. Poor and extremely poor[10] households are defined by using the administrative poverty line, according to eligibility for the *Bolsa Família* programme.

What is striking about Table 3 is that both poverty and extreme poverty have been drastically reduced in Brazil. However, people living in rural areas are still over-represented among those living in poverty, even more so when the head of the household works in agricultural activities. In 2013, for instance, 9 per cent of the people living in rural areas were extremely poor. When the head of the household worked primarily in agriculture, this figure increased to 11 per cent.

TABLE 3

Poverty and extreme poverty among the population by area of residence and household head's occupation in agriculture, Brazil, 2006–2013

	Total population		Rural population		Household head's occupation in agriculture	
Year	Poor	Extremely poor	Poor	Extremely poor	Poor	Extremely poor
2006	17.3%	5.8%	37.9%	15.1%	44.2%	19.3%
2009	13.5%	4.7%	29.6%	11.5%	35.6%	14.7%
2011	11.0%	4.4%	27.5%	11.3%	33.0%	13.4%
2013	9.0%	4.0%	22.9%	9.2%	28.3%	11.4%

Source: PNAD (2006–2013).

3 PUBLIC INSTITUTIONAL FOOD PROCUREMENT FROM FAMILY FARMERS

The Brazilian government procures food directly from family farmers primarily through two programmes, namely the PAA and the PNAE. Following the evolution of these two programmes, some interesting recent innovations can be documented regarding structured demand for Brazilian family farmers based on public procurement. More broadly, these two programmes are also important tools which, together with other social protection policies implemented in Brazil—including agrarian reform—aim to contribute to income redistribution, promote family farmers' production and foster rural employment, with the ultimate goal of eradicating hunger and poverty.

While the PAA was launched in 2003 with a clear focus on supporting family farmers via structured demand, the PNAE has taken on this role more clearly after a legislative change in 2009. The new legislation established a quota, such that a minimum of 30 per cent of food for schools must be purchased or procured from family farmers. The rationale used by the PAA and for this recent PNAE reform is rooted in the understanding that local food procurement can facilitate community development, bolster market access for family farmers and expand the access to food for food-insecure segments of the population.

Thus, both programmes have established an institutional market that has made purchases amounting to over BRL1 billion per year—in constant prices—from family farmers, from 2011 to 2013. The institutional procurement from family farmers, disaggregated by the PAA and PNAE programmes, from 2011 to 2013, in nominal prices in Brazilian currency (BRL) as well as in purchasing power parity (PPP) in US dollars (USD)[11] are shown in Table 4. Over this period the PAA decreased its expenditures, from BRL699 million in 2011 to BRL466 million in 2013. In contrast, the PNAE has increased institutional purchases from family farmers by BRL307 million. The share of each programme's institutional purchases from family farmers was more balanced in 2013, with the PNAE contributing 55 per cent of the total procurement. In previous years, the PAA was responsible for 70–75 per cent of the total procurement.

TABLE 4

Government food procurement from family farmers in Brazil, 2011 to 2013 (in millions)

Year	PAA		PNAE		Total	
	BRL nominal	USD PPP	BRL nominal	USD PPP	BRL nominal	USD PPP
2011	699	475	235	160	934	635
2012	847	542	366	234	1,214	776
2013	466	283	564	342	1,030	625
Total	**2,012**	**1,300**	**1,165**	**736**	**3,178**	**2,036**

Source: FNDE, Conab and PAA data/MDS.

Note: PPP conversion factor, GDP, World Bank, base year: 2011.

There are synergies between the structured demand of the two programmes and a similar public procurement strategy that relies on the softening of bidding regulations and on the targeting of family farmers. However, the implementation of each programme has its own operational details. The evolution and description of each programme will be detailed in the following sections.

3.1 THE FOOD ACQUISITION PROGRAMME (PAA)

The PAA was established by article 19 of *Lei No. 10.696* (2 July 2003). From the outset, the main idea of the programme was to support family farmers' production and their access to the market through simplified public procurement procedures, as well as to distribute food in the required quantity, quality and regularity to the food-insecure population.

These objectives were updated and further detailed in *Decreto No. 7.775* (4 July 2012) to encompass broader goals such as the promotion of biodiversity and the guarantee of the right to adequate food. The PAA became part of the National System for Food and Nutrition Security (SISAN), with the following goals:

- to incentivise family farm production by promoting their economic and social inclusion with sustainable surplus growth, the processing of food and the expansion of value-added production;
- to incentivise the consumption and appreciation of family farm production;
- to promote the access to food, in the quantity, quality and regularity required by the populations living under conditions of food and nutritional insecurity, based on the Right to Food legislation;
- to promote the supply of food through government food procurement, including the provision of school feeding at municipal, state, district and federal levels; as well as areas of public consortiums;
- to build up public food stocks produced by family farmers;
- to assist in building up food stocks through farmer cooperatives and other family farm organisations;
- to strengthen local and regional networks for food commercialisation;
- to promote biodiversity, organic production and agro-ecological food, and encourage healthy food habits at local and regional levels; and
- to promote the organisation of family farmers through cooperatives and associations (Brazil 2012).

The programme considers both producers and consumers as beneficiaries. On the food supply side, it prioritises family farmers who are more vulnerable, such as agrarian reform settlers or agrarian credit beneficiaries (beneficiaries of the PNRA or the PNCF); gatherers; fisherfolk; artisanal producers; indigenous people; and *quilombolas*. It also encourages the participation of women as producers, selling individually or through women's organisations. On the food demand side, the beneficiaries of food assistance are mostly the population at risk of food insecurity and hunger, poor and extremely poor households enrolled in the unified registry for social programmes (*Cadastro Único*), and female-headed households. It also benefits institutions that provide social assistance; public schools; and institutions that are part of SISAN, such as food banks, restaurants with subsidised prices (*restaurantes populares*) in urban settings and community kitchens.

Because it benefits both the supply side (producers) and the demand side (consumers), the PAA is financed by two different government ministries. Part of its budget comes from the Ministry of Social Development and Fight against Hunger (MDS), which is responsible for the social protection policies, and another part comes from the MDA. The overall implementation of the programme, however, encompasses more areas and stakeholders. An important feature of the implementation of the PAA was the creation of a managing body—the PAA Management Group (GGPAA)—responsible for the regulation and operational guidelines of the programme (GGPAA Resolution No. 63, 2013). The group comprises representatives from other ministries of the federal government encompassing the areas of education, agriculture (through Brazil's National Food Supply Company—Conab), finance and planning, in addition to social and agrarian development. The GGPAA encompasses key competencies regarding the stipulation of food prices; criteria for targeting beneficiaries; and the establishment of rules for quality control and for the definition of food assistance.

Additionally, the design of the PAA was influenced by civil society through contributions from the National Food and Nutritional Security Council (CONSEA) (CONSEA 2009). Its statutes note that it plays an advisory role to the President of Brazil in the formulation of policies and the definition of guidelines for the country to ensure the human right to adequate and healthy food across all its dimensions, through the tracking and monitoring of public policies and social programmes related to food security. It performs the role of ensuring the programme's social accountability (Leão and Maluf 2012). This model can also be replicated at regional and local levels through the establishment of food and nutritional security councils, to ensure transparency and accountability through the participation of civil society. Further information about CONSEA is provided in Box 2.

BOX 2

Social participation

CONSEA facilitates the dialogue between policymakers and civil society organisations to propose guidelines for actions regarding food and nutrition security. It holds bi-monthly meetings and is composed of one-third government officials and two-thirds civil society representatives. CONSEA evaluates the underlying causes of hunger and contributes to the discussions around the design of a rights-based framework for Brazilian food security policies. The Right to Food legislation helped to create a legal framework at the federal level that has facilitated policymaking aiming at guaranteeing that every Brazilian has the right to eat healthy and culturally appropriate food. Through these rights and with the participation of Brazilian civil society, CONSEA has advocated for innovative programmes that can support family farmers. It is responsible for the initial design of the PAA and for several changes and improvements in both the PNAE and the PAA since their original implementation.

PAA expenditures

The steady flow of resources since the beginning of the programme shows the government's commitment to strengthening social policies related to food and nutrition security. The public expenditures in the PAA in nominal BRL and in USD PPP from 2003 to 2013 are presented in Table 5. The investment in the PAA increased from BRL145 million to BRL466 million between 2003 and 2013, with a peak in 2012, when it reached BRL847 million.

Figure 1 shows PAA expenditures by region from 2010 to 2013. The Northeast region received the most resources. This is largely because one modality—namely PAA Milk (described further in the next section)—is only implemented in the semi-arid region, which in turn is predominantly located in the northeast of the country.

TABLE 5

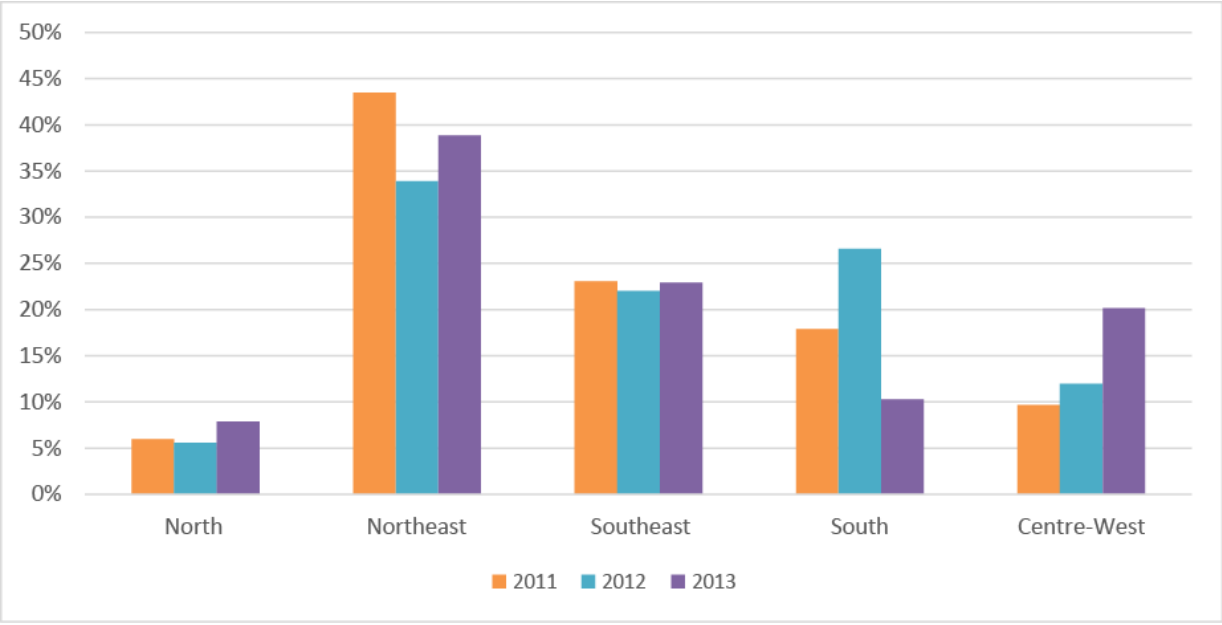
Distribution of the PAA's financial resources, 2003–2013

Year	Financial resources (in millions)	
	Nominal BRL	USD PPP
2003	145	149
2004	180	174
2005	333	306
2006	492	440
2007	461	392
2008	509	407
2009	591	454
2010	681	491
2011	699	475
2012	847	542
2013	466	283

Source: Sambuichi et al. (2013), PAA data/MDS and Conab (2011–2013).
Note: PPP conversion factor, GDP, World Bank, base year: 2011.

FIGURE 1

PAA expenditure by region of Brazil, 2010–2013, percentage of total



Source: Authors' elaboration based on data from Sambuichi et al. (2013), PAA data/MDS and Conab.

Description of PAA modalities

The PAA works through different modalities, with the goal of expanding its reach and effectiveness throughout the country. This section provides an overview of the main aspects of the functioning of these modalities. The PAA modalities in operation are: purchase for simultaneous donation; incentive for the production and consumption of milk (PAA Milk); direct purchase; stock formation; institutional purchase; and purchase of seeds. A brief description of the characteristics of each modality is presented in Table 6.

TABLE 6

Description of PAA modalities

Modality	Description	Yearly limit		Implementer	Type of access	Price
		Family farmers	Organisation			
Purchase for simultaneous donation	Purchase of food from local family farmers to donate to institutions or entities in the social assistance network	BRL6,500 (BRL8,000 when sold through an organisation)	BRL2 million	Conab, states and municipalities	Individuals, cooperatives/ associations or informal groups**	Average of 3 prices in local or regional wholesale market over the last 12 months
Incentive for the production and consumption of milk (PAA-Milk)	Purchase of milk for donation to families at risk of food insecurity in the semi-arid region	BRL8,000 (BRL4,000 per semester)	Not applicable	States in the semi-arid region	Individuals, cooperatives/associations	Averaging the prices paid to farmers over the last 3 months in each state
Direct purchase	Purchase of a list of products/produce to sustain price; an important role in the regulation of prices and supply	BRL8,000	BRL0.5 million	Conab	Individuals, cooperatives/ associations or informal groups	Conab's reference price
Stock formation	Financial support for stock formation of producers' organisations; provide tools to support commercialisation	BRL8,000	BRL1.5 million	Conab	Cooperatives/ associations	Conab's reference price
Institutional purchase	At least 30 per cent of public institutions' resources destined for the purchase of foodstuffs must be spent on produce from family farmers	BRL20,000 per institution	BRL6 million per institution	Federal government, states and municipalities	Cooperatives/ associations	Call for proposals based on price research (minimum 3) in the local or regional market or PNAE's reference price
Purchase of seeds	Purchase of non-genetically modified seeds and seedlings for donation	BRL16,000	BRL6 million per organisation	Conab	Cooperatives/ associations	Average of 3 price quotes in the local regional market for similar seeds, considering logistical costs

Notes: * The limit increases to BRL8,000 for purchases through organisations.

** At least 40 per cent of purchases from women.

Source: Authors'elaboration based on legislation from MDS and Conab.

The most widely used modality within the PAA is purchase for simultaneous donation (CDS). The CDS modality provides market access for family farmers and food assistance for vulnerable populations. It has a far-reaching coverage, through three different implementing partners (Conab, state governments and municipalities). It incentivises cooperativism, the participation of women (40 per cent of family farmers), and two of its implementing partners even offer a

simplified payment system (through a debit card). A detailed description of its functioning can be found in Nehring and McKay (2013). It is worth mentioning that the diversification of products is also an important feature of this modality; it includes a list of over 400 different raw or processed food products. When Conab[12] carries out this modality, information on the quality, quantity and price of the products donated is detailed on a delivery form. The paperwork is then forwarded to Conab along with an invoice, where it is analysed before any payment is made to the family farmer or the organisation.

BOX 3

Conab

Brazil's National Supply Company (Conab) is a central institution responsible for constructing and maintaining food stocks in the country. It was created in 1990, shortly after Brazil's re-democratisation. It is a merging of three other institutions, namely the Brazilian Food Company (Cobal), the Production Financing Company (CFP) and the Brazilian Storage Company (Cibrazem) (Gandolfi et al. 2010). Conab's mandate is to manage agricultural policies and food supply to ensure the basic needs of Brazilian society in ways that preserve and encourage market mechanisms. These objectives were primarily met through price guarantees for farmers and limited procurement programmes, but none of those was focused specifically on family farmers. It would take just over a decade until Conab would focus on family farm agriculture and social programmes in tandem with the MDA and MDS (ibid.). The 2008 global food crisis signalled an increased role for Conab to secure sufficient food stocks to mitigate the volatility of global prices and maintain sufficient demand for both family farm production and household consumption. Almost every state in Brazil has a Conab office that helps to grant institutional assistance to farmers and farmers' organisations in regards to issues such as procurement processes, price guarantees and local food stocks. This institution has been a crucial mechanism to implement and extend the coverage of structured demand policies to many vulnerable and marginalised populations throughout the country.

PAA Milk is the second largest modality in terms of resources. Milk is purchased from family farmers and then pasteurised and distributed to beneficiaries. It is the only modality restricted to the semi-arid region[13] of Brazil. Beneficiaries are either institutions or vulnerable groups such as young children, pregnant women and elderly people, among others.

Conab is the sole implementing partner of the direct purchase, stock formation and purchase of seeds modalities. Direct purchase has the objective of regulating prices and ensuring public stocks of foodstuffs out of a list of products previously established by the GGPAA. Stock formation offers financial support towards the establishment of food stocks by farmers' organisations for subsequent sale and the return of resources to the government or products to sustain public stocks.

There is a relatively new PAA modality—institutional purchase—enacted in October 2011, that does not imply additional financial resources from the PAA budget. It extends the benefit of minimising the bidding process to a range of government institutions. Through this newer modality, public institutions such as hospitals, prisons and military bases must allocate at least 30 per cent of their budgets for food procurement to purchasing from local family farms according to the rules and guidelines established by the programme's legislation in 2015.

Purchase of seeds is the most recent modality added to the PAA, in August 2014. It adds the procurement of seeds and seedlings, to be donated to selected beneficiaries, to the programme's scope and legal framework. This modality has been in place since January 2015. Conab receives requests for seeds and seedlings from applicant institutions and then performs the procurement using a soft tender process. The applicant institutions are responsible for selecting beneficiaries and certifying delivery. Applicant institutions include the MDA, INCRA, the National Indigenous Foundation (FUNAI), Palmares Cultural Foundation, Chico Mendes Institute and states. Priority must be given to beneficiaries categorised as settlers, indigenous people, *quilombolas* or vulnerable families.[14] It is important to note that the purchase of genetically modified seeds through the PAA is not allowed.

When the PAA started in 2003, farmers could only sell products to a maximum value of BRL2,500 annually to the programme. Since then, the annual cap has been increased. It now ranges from BRL6,500 to BRL20,000 per farmer, depending on the modality. This cap prevents the concentration of purchases on a small number of producers, spreading the purchases across a larger number of family farmers (preferably clustered in farmers' cooperatives or formal associations). Farmers can now participate in several modalities to increase their institutional sales, within the limit set for each modality. A yearly limit is also imposed on farmers' organisations (cooperatives and associations) within each modality.

Food procurement must have compatible/comparable prices to local or regional markets, as established by *Decreto No. 7.775/2012*. The methodology for price setting is determined by the GGPAA, usually based on the average price found in the local market. There is also a measure that encourages producers to transition to agro-ecological production. Agro-ecological or organic foods can be purchased with a maximum premium of up to 30 per cent over the normal price. Thus, the PAA price for organic and agro-ecological products may end up being above the normal price (*Lei No. 12.512/ 2011*).

Produce commercialised through the PAA must comply with rules and regulations regarding the sale of vegetable and animal products. Industrialised and processed food items should comply with the norms and regulations of the Brazilian Health Surveillance Agency (Anvisa/Ministry of Health) and the Agricultural and Livestock Health Care System (Suasa/Ministry of Agriculture, Livestock and Food Supply). Compliance with these norms and regulations must be observed throughout the PAA procurement process. However, specific norms for animal and vegetable products and processing will be developed in 2015 to address the needs of family farmers (*Decreto No. 8.471, 22/06/2015*). Raw products such as fruits and vegetables are inspected upon delivery.

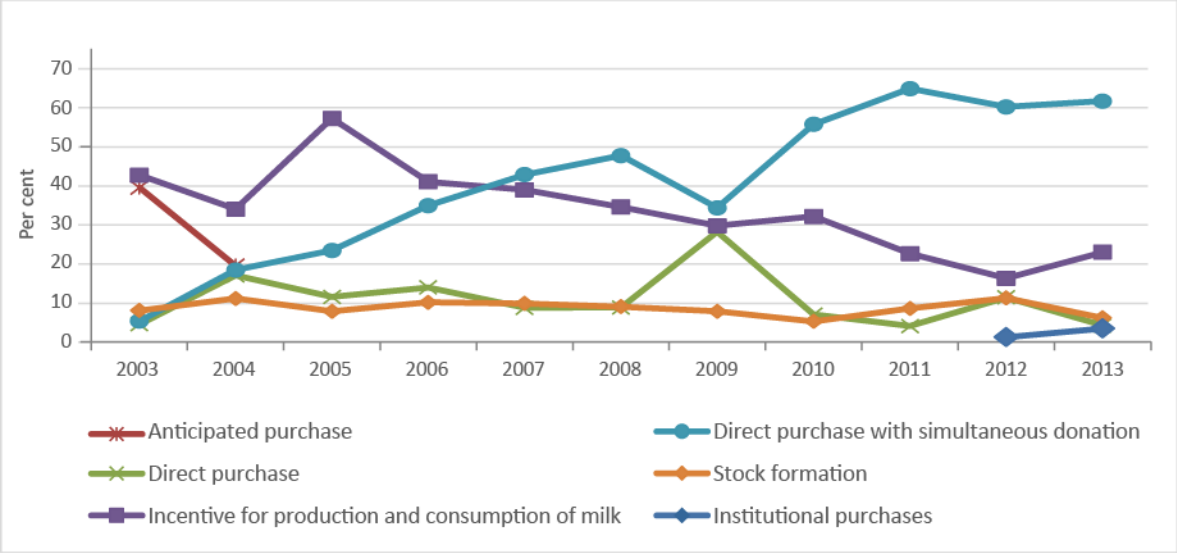
Minimising food losses and waste is crucial to the efforts to improve food security. Overall food losses in Brazil account for 10–30 per cent of all fruit and vegetables produced, according to previous appraisals (Fehr et al. 2001). The estimate does not specify in which part of the food supply system the losses occur, and the programme does not explicitly account for estimates of food losses from farming and post-harvesting all the way to packing.

Figure 2 shows the evolution of the programme's financial resources according to each modality. PAA Milk used the most resources from the beginning of the programme until 2006. After 2007 the CDS modality became the most prominent in terms of resource allocation. Expenditure from the other modalities remained mostly steady during the same period, with the exception of direct purchase in 2009. A drop in resources for the PAA in 2013 can be seen across all modalities except for institutional purchase, which experienced an increase in

expenditure in 2013. The budget for institutional purchase is not linked to the overall budget of the programme, as the resources for food procurement from family farmers come from the institution responsible for the purchase. It is interesting to note that the CDS modality has grown ever more important over the years and is now the flagship of the PAA, accounting for over 60 per cent of the resources spent on the programme.

FIGURE 2

PAA expenditure by modality, 2003–2013, percentage



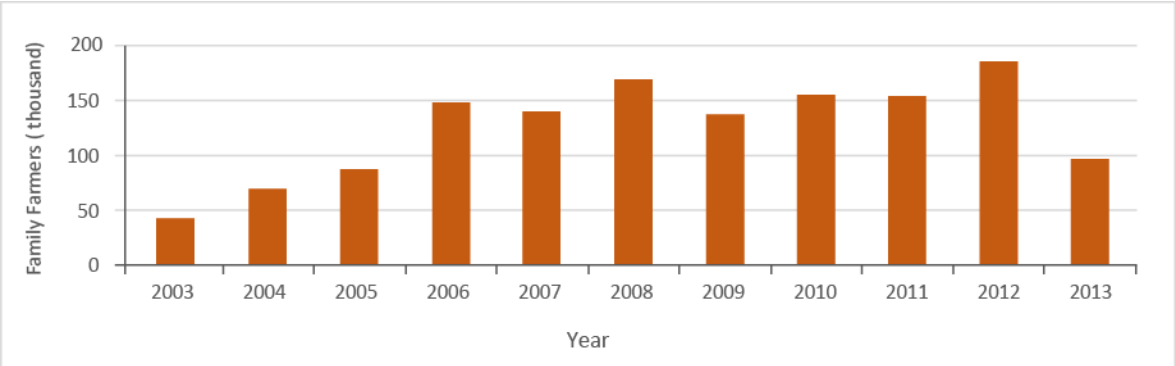
Note: Anticipated purchase ended in 2005, while institutional purchase started in 2011.
Source: Sambuichi et al. (2013), PAA data/MDS and Conab (2011–2013).

Family farmer beneficiaries

The number of family farmers covered by the PAA grew from 42,000 in 2003 to 185,000 in 2012 but then decreased to 96,533 in 2013, as can be seen in Figure 3.The coverage is far too low to reach the target of more than 3 million family farmers for institutional food procurement programmes (those possessing a DAP number A, A/C or B in 2014).

FIGURE 3

Family farmers participating in the PAA, all modalities, 2003–2013



Source: Authors' elaboration based on Sambuichi et al., 2013 and PAA DATA MDS 2011-2013.

3.2 NATIONAL SCHOOL FEEDING PROGRAMME (PNAE)

School feeding interventions in Brazil have a long history dating back to the 1940s. Since then, a number of major policy reforms were implemented until the PNAE reached its current coverage of basic education—which includes elementary education (from six months to five years old) and secondary education (17–18 years old), as well as young and adult students who attend special classes (Education for Youth and Adults—EJA). School meals in Brazil feed around 45 million students nationwide and, as such, offer a sizeable institutional market for food producers (MEC 2013).

In 2003 the Zero Hunger strategy was adopted, with the goal of fighting hunger and poverty. As a central feature of this strategy, important steps were taken to strengthen the PNAE. The government's Food Security and Nutrition System introduced the concepts of 'food culture' and 'local solutions' to respond to food insecurity, leading the PNAE to subsequently reinforce the need to procure from local producers. Social participation and accountability through the School Feeding Councils (CAEs) at the municipal level (which are mandated to oversee and monitor food purchases) and the work of the nutritionist as the person responsible for the school menu (responsible for including local products and for taking eating habits into account) were decisive steps in increasing demand for local products.

After this long process of decentralisation, where priority was given to local suppliers, in June 2009 a new PNAE law (*Lei No. 11.947/2009*) introduced the legal requirement of at least 30 per cent of the federal government's budgetary spending for school meals being used to fund food purchases from family farmers and/or family farm organisations. This legal framework also mandated that priority must be given to family farmers from the agrarian reform settlements, traditional communities such as *quilombolas* and indigenous peoples (DAP category A). Organic food and food produced via agro-ecological practices should also be prioritised in school menus, in line with similar priority criteria developed by the PAA. With its new legal framework, encompassing both *Lei No. 11.947* and FNDE's resolutions 38/2009 and 26/2013, the PNAE has become an important tool to strengthen the structured demand for food produced by local family farmers.

In addition to its primary objective of addressing the food and nutritional security of school children, the PNAE also supports their education by addressing some of their nutritional needs through one meal per day; stimulating healthy nutritional habits and providing nutrition education; and improving learning capacity and performance.

PNAE budget

With an annual transfer of BRL3.539 billion from the federal government for food procurement, the PNAE has the resources to significantly increase family farming income and expand market opportunities. The financial resources devoted to school feeding are implemented by the education departments of municipalities, states and the Federal District through a decentralised legislation enacted in 1994 (*Lei No. 8.913*). The federal government earmarks resources for school meals to the executing agencies, based on student enrolment in the previous year's educational census.

Table 7 shows the evolution of the total amount transferred from the federal government to executing agencies to procure food for the PNAE from 2003 to 2013 (in nominal BRL values

and in USD PPP). In 2003 the programme spent about BRL954 million, and the amount has increased every year since then. The majority of this increase took place after 2008, and it increased considerably in 2010. This was due to two changes: the expansion of PNAE's coverage to include secondary school students and students in special classes, such as young adult and adult education in 2009; and the increase in the per capita (per student) value of the transfer from BRL0.22 to BRL0.30 for students in the pre-school to high school range and to BRL0.60 for nursery children; from BRL0.44 to BRL0.60 for indigenous and *quilombola* students; and from BRL0.66 to BRL0.90 for students in schools which take part in the *Mais Educação* (More Education) programme (Albaneide 2013).[15]

TABLE 7

Financial resources allocated by the federal government to the PNAE, 2003–2013

Year	Financial resources (in the millions)	
	Nominal BRL	USD PPP
2003	954.2	979
2004	1,025	991
2005	1,266	1,165
2006	1,500	1,342
2007	1,520	1,294
2008	1,490	1,191
2009	2,013	1,545
2010	3,034	2,188
2011	3,051	2,074
2012	3,306	2,116
2013	3,539	2,146

Note: PPP conversion factor, GDP, World Bank, base year: 2011.

Source: Authors'elaboration based on FNDE data.

PNAE's 30 per cent rule of mandatory purchases from family farmers combines the objective of improving the food and nutritional security of consumers—in this case, students—with the objective of offering structured demand for family farmers. The greatest innovation brought about by this new legislation, which is similar to the PAA legal framework, was the waiver of the formal procurement process, which usually focused only on prices and competitiveness, as well as legal tax compliance. Traditional procurement would make it practically impossible for family farmers to compete with larger firms in the bidding process. Traditional procurement regulation awards contracts based on lowest price bid criteria and sets procurement for large batches. PNAE procurement for family farmers sets prices and awards contracts based on family farmers' delivery capacity.

Prices for the PNAE are similar to those observed in the local market (preferably prices observed in the local farmers' market, if there is one at the municipal level). Regardless of market prices, however, the premium for organic foods and foods produced via agro-ecological practices can only be of 30 per cent, at most, compared to regular goods. The cost of transportation for the delivery of the products to schools (as a means of boosting family farmers' interest in taking part in the process) is also taken into account when determining the price. The National Fund for the Development of Education (FNDE)—

which is linked to the Ministry of Education (MEC)—is responsible for the programme's management. The FNDE published a booklet entitled 'Acquisition of Produce from Family Farmers for School Meals' that describes how implementing agencies should organise a 10-step procurement process targeted at family farmers. These steps are detailed in Box 4 (adapted from Saraiva et al. 2013).

BOX 4

PNAE procurement from family farmers

Step 1: Budget
Identify the amount transferred by the federal government based on the school census of the previous year. Estimate the proportion of purchases from family farmers to be implemented during the year.
Step 2: Menu
The nutritionist responsible for the school menu must: (a) map the products produced by local smallholder farmers; (b) prepare a menu with these products, taking into account the nutritional requirements; and (c) inform the municipality of the products and respective amounts to be purchased.
Step 3: Price listing
The municipality should survey the prices of products in the local market, including the transportation costs for delivery to the schools.
Step 4: Public procurement — open call
An open call details the products, price and quantities demanded by the executing agency in order to proceed with the purchase.
Step 5: Sale proposal
Family farmers respond to this call with a sale proposal in which they state how much they are able to supply with regard to the demand detailed in the open call, respecting the limit of BRL20,000 per year per DAP per executing agency.
Step 6: Receiving proposals
The required documents specified in FNDE resolution No. 23/2012 must be attached to the proposal for it to be considered valid. They are as follows: • For informal groups: individual DAP, Individual Taxpayer Registry (CPF) of each family farmer and the sale proposal. • For formal groups: corporate/legal entity DAP (***DAP*** *Jurídica*), National Registry of Legal Entities (CNPJ) and all fiscal and labour documents proving that the group is operating legally and detailing the sale proposal.
Step 7: Samples for quality control
Food items should comply with the norms and regulations of the following agencies: Brazilian Health Surveillance Agency (Anvisa/Ministry of Health); and Agricultural and Livestock Health Care System (Suasa/Ministry of Agriculture, Livestock and Food Supply).

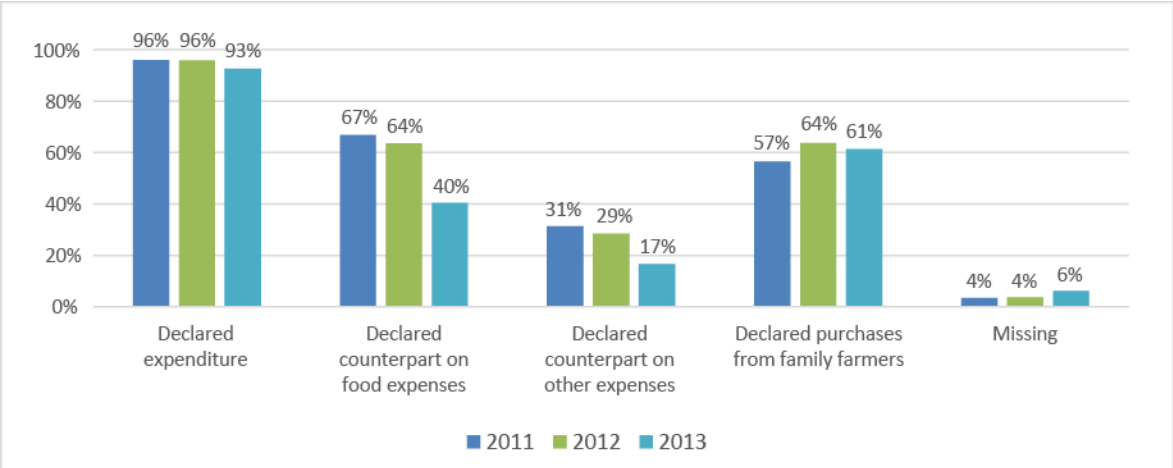
Step 8: Project selection and evaluation
The municipality will choose the projects according to the following priorities: projects from family farmers from the (i) municipality; (ii) region; (iii) rural area; (iv) state; and (v) country.[16] Within these groups, land reform settlers, indigenous communities and ***quilombolas*** should also be prioritised, according to the different DAP categories as discussed in the PAA section.
Step 9: Contract/project signing
The municipality and the family farmers or the cooperative will sign the sale proposal, which must also detail the schedule for product delivery to the schools as well as the payment dates.
Step 10: Product delivery
The family farmers or the cooperative will deliver the products according to the timeline detailed in the sale proposal.

As the PNAE's manager, the FNDE monitors and oversees the expenditures of the programme for each executing agency (municipalities, states and federal district). These executing agencies submit their expense reports annually, for purposes of monitoring and evaluation, via an online system developed by the FNDE. It also includes information on how much has been spent on purchases from family farmers, to assess whether or not executing agencies are complying with the legal minimum of 30 per cent to be spent with purchases from family farmers. The indicator for this database is the proportion of aggregate DAP expenses over FNDE resources transferred to the executing agencies.

The 2013 database has information on 5,562 executing agencies, whereas the 2011 and 2012 databases have information on 5,523 and 5,529 executing agencies, respectively. Figure 4 shows the reported information submitted by type of expense. In 2013, information was missing for 6.3 per cent of the agencies; the main executing agencies lagging behind in the submission of this information were from the Southeast (2 per cent) and the Northeast (2.2 per cent) regions. The remaining 2.1 per cent was spread out among agencies across the rest of the country. Fifty-seven per cent of the executing agencies reported purchases from family farmers in 2011. Even though this figure increased to 61 per cent in 2013, 40 per cent of the executing agencies still did not report any purchases from family farmers.

FIGURE 4

Executing agencies and type of information reported in the FNDE system



Source: Authors'elaboration based on data from the FNDE (2011–2013).

Table 8 shows the PNAE's total expenditure on food procurement, including expenses from all three levels of the government: federal, state and municipal. The reported information shows that in 2013 the PNAE's annual budget added up to BRL5.414 billion. The information received from executing agencies is organised into two types of expenses: the expenditure to complement food purchases, and other expenses. Most of the reported expenses accounted for food purchases, totalling BRL1.5 billion. Thus, adding up the federal transfer (BRL3.153 billion) and the executing agencies' own resources, the amount spent on food purchases reached BRL4.653 billion. Other expenses (non-food related) amount to BRL761 million.

TABLE 8

Executing agencies' reported expenses from federal transfers destined for food purchases, counterpart and total expenses (in millions), 2011–2013

Year	Reported expenditure from the federal transfer (A)	Executing agencies' counterpart expenses		Total expenses (A+B+C)	
		Food expenses (B)	Other expenses (C)	Nominal BRL	USD PPP
2011	2,848	1,703	691	5,243	3,564
2012	3,215	1,632	855	5,703	3,651
2013	3,153	1,500	761	5,414	3,283

Source: FNDE (2011–2013).

The amount reported on purchases from family farmers reached BRL564 million in 2013, as shown in Table 9. There was an increase in the proportion of institutional food procurement from family farmers from 8.3 per cent in 2011 to 17.9 per cent in 2013. Despite this increase, the PNAE has not reached the threshold of 30 per cent of food purchases from family farmers across the nation, as required by legislation. Figure 5 presents institutional food procurement from family farmers by region. When disaggregating by region, once can see that there was an increase in purchases from family farmers across all regions. However, only the Centre-West region reached the 30 per cent minimum threshold. The Northeast region reported the least purchases from family farmers—around 14 per cent.

TABLE 9

Executing agencies' reported expenses from federal transfers destined for food purchases and reported purchases from family farmers

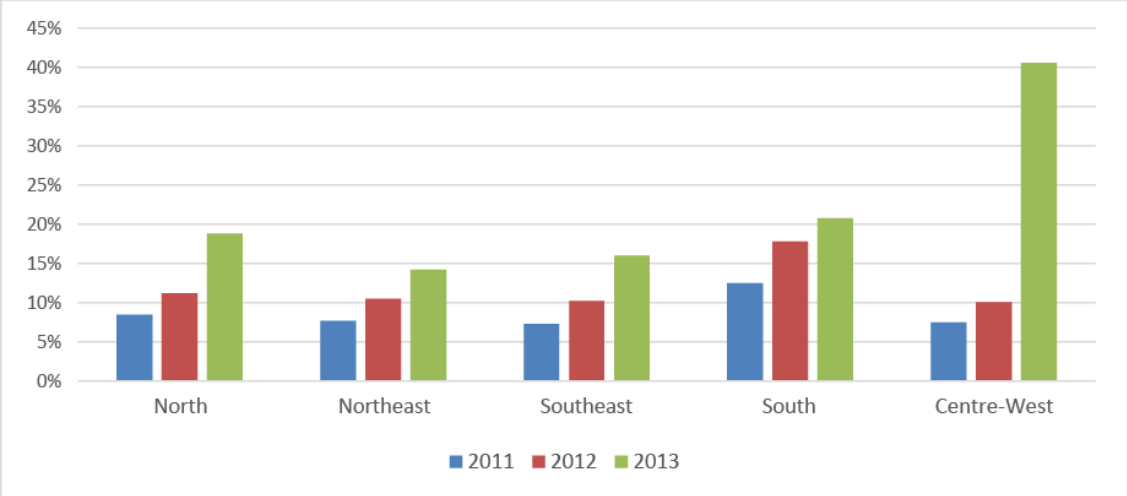
Year	Reported expenditure from the federal transfer (nominal BRL, millions)	Food budget used to purchase from family farmers (nominal BRL, millions)	
2011	2,848	235	8.3 %
2012	3,215	366	11.4%
2013	3,153	564	17.9%

Source: Authors' elaboration based on data from the FNDE (2011–2013).

Table 10 shows the result of a simulation exercise based on the aforementioned data. We calculated how much would be spent on products from family farmers if each of the executing agencies were to reach the 30 per cent institutional procurement threshold set by the current legislation. To answer this hypothetical question, we closed the gap for each executing agency that reported not reaching the 30 per cent requirement. We estimate that if every implementing agency had met the threshold, the PNAE would have purchased products worth a total of BRL1.162 billion from family farmers in 2013.

FIGURE 5

PNAE's reported family farmer procurement by region, 2011–2013, percentage



Source: Authors' elaboration based on data from the FNDE (2011–2013).

TABLE 10

Potential purchases for the PNAE's reported institutional procurement from family farmers if the 30 per cent legal requirement had been achieved, 2011–2013

Year	Purchases from family farmers (nominal BRL, millions)	If the 30 per cent threshold had been met (BRL, millions)
2011	235	941
2012	366	1,036
2013	564	1,162

Source: Authors' elaboration based on data from the FNDE (2011–2013).

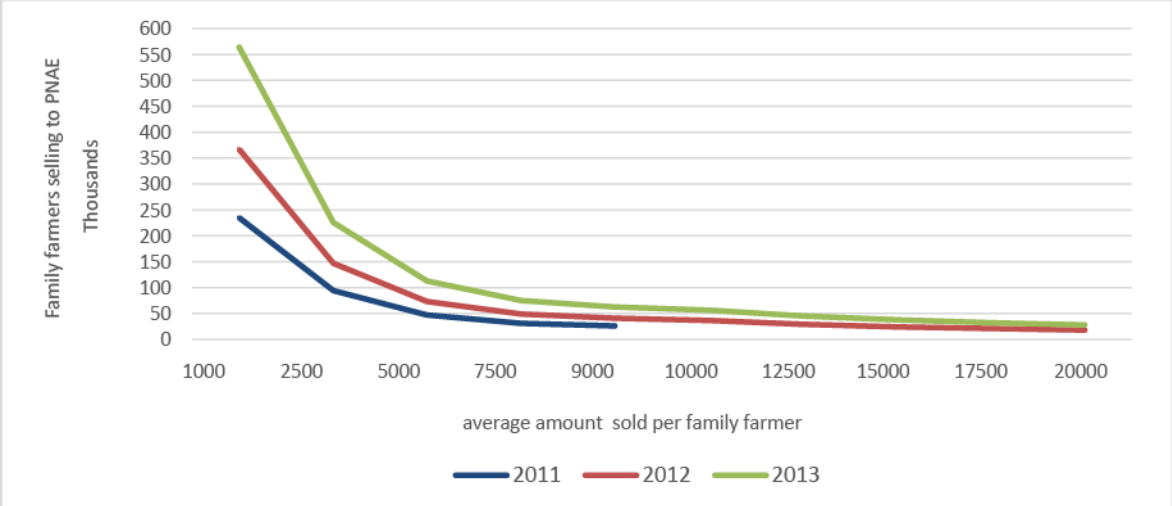
Estimating the number of family farmers supplying the PNAE

When the law was enacted in 2011, the maximum amount of purchases from individual farmers was established in a similar way to that of the PAA. The cap was initially set at BRL9,000 per year (per family farmer). There was an increase in 2015 to BRL20,000 for each family farmer (per DAP) per year per executing agency (FNDE 2015). It is interesting to observe that the price ceiling established by the PNAE is more than double the one set for the PAA modalities, except for institutional purchase, which has the same cap. This reflects the trade-off between diversifying suppliers and the need to have a minimum scale to supply schools' demand for food on a regular basis, particularly in medium and large cities.

Figure 6 estimates the number of family farmer beneficiaries from the PNAE's institutional procurement. If all farmers had reached their PNAE purchase cap of BRL20,000, around 28,216 farmers would have benefited from the programme. This is hardly the case, as the average amount purchased from family farmers is usually much smaller, particularly in small towns. If the average amount sold per family farmer were BRL5,000, around 112,868 farmers would have benefited from the programme. As the average amount sold per family farmer to the programme is not known, Figure 6 depicts the range of the PNAE's coverage, taking into consideration an average of BRL1,000, up to the cap of BRL20,000 per family farmer (or DAP)—i.e. from 564,340 to 28,216—in 2013.

FIGURE 6

Estimate of the number of family farmers participating in the PNAE, 2011–2013



Source: Authors' elaboration based on data from FNDE data (2011–2013).

4 GOVERNMENT FOOD PROCUREMENT: MEASURING DIRECT AND INDIRECT GOVERNMENT PURCHASES FROM AGRICULTURE

This section presents the government purchases from the agricultural sector and puts forward a methodology to estimate the indirect effects of government purchases from the food industry on the agricultural sector. It is known that in addition to direct purchases from farmers, the government (through institutional purchases) also buys semi-processed and processed agricultural products—i.e. outputs from the food industry. National Accounts data allow us to estimate the potential indirect effects of food industry purchases on the agricultural sector and to gauge the relative sizes of the PAA and the PNAE with respect to all structured demand (institutional purchases) in the country.

To determine the level of government purchases related to agricultural products, we consider direct purchases as those purchases from the following sectors in the National Accounts: 'public education', 'public health' and 'other government services'. Indirect purchases are monetary purchases of industrialised foodstuffs (beef, poultry, beef patties, white rice, wheat or various types of flour) derived from agriculture. While direct purchases are taken directly from the National Accounts data, indirect purchases are estimated based on some assumptions that we explain in detail as follows, and in the appendix.

At the time of this research, the most recent National Accounts data made available by the Brazilian Institute of Geography and Statistics (IBGE) relate to 2003–2009. They are based on the UN System of National Accounts of 1993 (see, for example, United Nations 2003). We mostly use the product/activity data from the Supply and Uses Tables (SUTs).

The SUTs present information on the total supply of products listed—for example, total output of soy seeds, total output of soy cooking oil etc. Total supply is presented by industry source (crop production and fishing; cattle ranching; food manufacturing) for domestic output and imports. The use of each product is broken down into intermediate consumption (when a good is used as an input for sectoral output) and final demand (family or government consumption, investment or exports).

It is important to note that purchases of crop and ranch production actually mean the purchase of products such as unprocessed rice and live cattle (*boi em pé*). However, when products such as rice and beef are acquired through public procurement to supply schools, they have already been processed by the food industry; therefore, we should observe very few direct purchases from the agricultural sector, mostly limited to fresh fruits and vegetables.

A central idea to our analysis is the fact that, in addition to direct purchases from farmers ('agriculture'), government purchases of food industry outputs actually derive from farmers and ranchers, as 'industrial' inputs must be acquired from the latter. These 'indirect purchases' from family farmers are not recorded in the programme's statistics. We contribute to the debate by highlighting that National Accounts provide a tool to measure the extent of these purchases.

We calculate the amount of institutional procurement that derives from agriculture, using constant input requirements of food industry outputs from agricultural products. Technical details are in the appendix, and the main figures are presented below.

To give an example of the estimates, we use 2009 figures. In that year, based on National Accounts, direct purchases (final demand) from agriculture, plus the purchase of intermediate products by government sectors (education, health and public administration) added up to BRL675 million. Direct purchases by the government represented 0.2 per cent of the country's total agricultural supply. However, around 2.5 per cent of this supply was actually imported, so we can estimate a direct public procurement of BRL650.3 million from Brazilian farmers in 2009.

The government also purchased industrialised foodstuffs, from simple beef cuts to items such as fried chicken nuggets, coffee, refined sugar, flour and others. These purchases totalled BRL8.0 billion in 2009, or 1.5 per cent of the total supply of these products. Imports represented up to 2.4 per cent of the total supply of these goods. Using this average imported share, total government purchases of food and beverage products from domestic producers are estimated at BRL7.8 billion.

The SUTs describe the input requirements for industrial output. We do not have a detailed input use; namely, we do not have information on how much flour is used to produce processed meats such as chicken nuggets—i.e. there is no product-to-product input use. In monetary figures, what can be calculated is how much wheat was used by the food industry as a whole to generate its output. Based on aggregate figures, it can be seen that for each BRL1 million in output, the domestic foodstuff industry purchased BRL0.45 million in agricultural produce. Taking into account that part of these inputs came from overseas, we estimate input purchases from domestic producers at BRL0.43 million for each BRL1 million in industrial output. Since government purchases from domestic producers added up to BRL7.8 billion, we estimate indirect institutional procurement from agriculture at BRL3.5 billion in 2009 using produce-specific import shares.

Adding up direct and indirect purchases, we estimate total Brazilian government procurement (from federal, state and municipal levels) from domestic agricultural producers at BRL4.1 billion in 2009, based on National Accounts.

Using yearly data, Table 11 presents the total agricultural output for 2003–2009, for which data are available, as well as our estimates of total government purchases of agricultural products, both direct and indirect. We thus calculate the share of total domestic agricultural output that corresponds to direct and indirect government demand—i.e. sold directly to the

government or indirectly as inputs for food industry outputs that are purchased by the government. The share increased from 1.18 per cent (2003) and 1.15 per cent (2004) to 1.33 per cent in 2005 and has been fluctuating around the 1.3 per cent level since then.

TABLE 11

Agricultural output and total (direct and indirect) institutional purchases

Year	Total domestic agricultural purchases (BRL millions)	Total domestic agricultural output (BRL millions)	Share
2003	2,286.5	194,432.3	1.18%
2004	2,471.8	214,523.7	1.15%
2005	2,766.6	207,947.5	1.33%
2006	2,920.9	213,151.8	1.37%
2007	3,387.7	244,915.0	1.38%
2008	4,048.8	305,367.3	1.33%
2009	4,109.6	301,049.1	1.37%

Source: Authors' estimates based on IBGE National Accounts data.

Table 12 shows the total institutional purchases and output of food products. Here, government purchases represent direct purchases only. The share of institutional purchases from the food industry has increased over time. There is a level change from 2003–2004 (1.30 per cent and 1.34 per cent, respectively) to 2005 and later (around 1.5 per cent).

TABLE 12

Food industry output and total institutional purchases

Year	Total food purchases	Total domestic food output	Share
2003	3,970.60	292,568.32	1.36%
2004	4,365.08	335,466.09	1.30%
2005	5,226.21	355,324.42	1.47%
2006	5,745.21	377,927.82	1.52%
2007	6,367.03	420,073.68	1.52%
2008	7,322.72	492,849.66	1.49%
2009	7,808.69	524,846.67	1.49%

Source: Authors' estimates based on IBGE National Accounts data.

Note that one should not add up the institutional procurement from the food and agricultural sectors (Tables 12 and 11, respectively). The agricultural estimates include the input content of the food products procured. Adding shares across tables would lead to double counting (e.g. soy beans used as inputs and the full value for soy oil). Disaggregated direct and indirect estimates are presented in Table 13. It can be seen that a large part of domestic purchases from agriculture are actually indirect purchases. Indirect purchases are around six times higher than direct purchases. This is expected, as direct purchases of agricultural products exclude processed food—even very simple processing, such as livestock slaughtering and rice peeling. Table 13 also shows that food industry purchases generate demand from the agricultural sector of 40–50 per cent of their value; that is, for each BRL1 in food purchases, demand for

agricultural input is about BRL0.4 to BRL0.5. The figure varies over time due to changes in food product demand profiles and technological changes.

TABLE 13

Food industry output and total institutional purchases (in BRL millions, nominal values)

Year	Direct domestic purchases from food industry	Direct domestic purchases from agriculture	Indirect domestic purchases from agriculture	Total domestic purchases from agriculture
	(A)	(B)	(C)	(B)+(C)
2003	3,970.6	295.8	1,990.7	2,286.5
2004	4,365.1	330.2	2,141.6	2,471.8
2005	5,226.2	389.6	2,377.1	2,766.6
2006	5,745.2	438.5	2,482.4	2,920.9
2007	6,367.0	498.9	2,888.8	3,387.7
2008	7,322.7	589.9	3,458.9	4,048.8
2009	7,808.7	650.3	3,459.2	4,109.6

Source: Authors' estimates based on IBGE National Accounts.

We can break down the figures from Tables 11–13 by government service—namely, education, health and others (defence, judiciary etc.). Tables 14 and 15 present the breakdown of purchases from the agricultural and food industries, respectively. We observe a steady increase in expenditures for education at the expense of other government services, making it the main source of demand from the public sector. For the agricultural sector, expenditures for education increased from 30 per cent of government procurement in 2003 to 53 per cent in 2009, and for the food industry it increased from 23 per cent to 44 per cent. Agricultural procurement for health services also increased, but it represents only a smaller proportion of total expenditures, reaching only 7 per cent for agriculture and 9 per cent for the food industry in 2009.

To obtain agricultural and food industry total production estimates for 2010–2013, a different methodology was employed, as the input/output data are only available up to 2009. We extrapolated the 2009 figures of the nominal output indices calculated from IBGE Agricultural sector and food industry output estimates for 2010–2013, based, respectively, on the GDP growth measured by the quarterly National Accounts for the agricultural sector and on the monthly real output indicator for the food industry as per the Monthly Manufacturing Survey (*Pesquisa Industrial Mensal*—PIM). The total domestic agricultural output and total domestic food output estimates are presented in Table 16, completing the series started in Table 11.

TABLE 14

Direct institutional purchases of agricultural output by public services
(in BRL millions, nominal values, or percentage shares)

Year	Direct domestic purchases from agriculture	Direct domestic agricultural purchases for education	Direct domestic agriculturale purchases for health	Direct domestic agricultural purchases for other services
2003	295.8	30%	5%	65%
2004	330.2	30%	6%	64%
2005	389.6	31%	6%	63%
2006	438.5	34%	5%	61%
2007	498.9	42%	6%	51%
2008	589.9	42%	6%	52%
2009	650.3	53%	7%	40%

Source: Authors' estimates based on IBGE National Accounts.

TABLE 15

Direct institutional food purchases by public services
(in BRL millions, nominal values, or percentage shares)

Year	Direct domestic food purchases from the food industry	Direct domestic food purchases for education	Direct domestic food purchases for health	Direct domestic food purchases for other services
2003	3,970.6	22%	7%	70%
2004	4,365.1	24%	7%	69%
2005	5,226.2	23%	7%	70%
2006	5,745.2	26%	6%	67%
2007	6,367.0	33%	8%	59%
2008	7,322.7	34%	8%	58%
2009	7,808.7	44%	9%	47%

Source: Authors' estimates based on IBGE National Accounts.

TABLE 16

Estimates of agricultural and food output (in BRL millions, nominal values)

Year	Total domestic agricultural output	Total domestic food output
2003	194,432.3	292,568.3
2004	214,523.7	335,466.1
2005	207,947.5	355,324.4
2006	213,151.8	377,927.8
2007	244,915.0	420,073.7
2008	305,367.3	492,849.7
2009	301,049.1	524,846.7
2010	327,750.1	664,926.6
2011	368,869.8	685,665.8
2012	379,369.4	778,470.6
2013	449,172.0	836,599.0

Note: 2010–2013 production estimates from aggregate index growth.

Source: Authors' estimates based on IBGE National Accounts.

Table 17 provides estimates of the institutional procurement for 2009–2013 using information from the preceding tables. We estimate that, in 2013, government purchases from the federal government, states and municipalities for all uses reached almost BRL6 billion from agriculture and BRL12.5 billion from the food industry. This amounted to 1.37 per cent of the total agricultural output and 1.49 per cent of the total food industry output.

TABLE 17

Estimates of institutional procurement from the agricultural sector and the food industry
(nominal values in BRL millions, and USD PPP)

Year	Total agricultural purchases		Total food purchases	
	Nominal BRL	USD PPP	Nominal BRL	USD PPP
2003	2,286.5	2,345.7	3,970.6	4,073.4
2004	2,471.8	2,389.3	4,365.1	4,219.3
2005	2,766.6	2,545.7	5,226.2	4,809.0
2006	2,920.9	2,614.2	5,745.2	5,141.9
2007	3,387.7	2,883.3	6,367.0	5,419.0
2008	4,048.8	3,236.2	7,322.7	5,853.1
2009	4,109.6	3,155.1	7,808.7	5,995.0
2010	4,474.1	3,226.3	9,892.8	7,133.8
2011	5,035.4	3,422.9	10,201.4	6,934.7
2012	5,178.7	3,314.9	11,582.1	7,413.8
2013	6,131.6	3,718.0	12,446.9	7,547.5

Note: 2003–2009: Table 11 (Agriculture) and Table 12 (Food); from 2010–2013 constant share expanding from Table 11/12 figures (agriculture: 1.37 per cent; food: 1.49 per cent based on 2009 share). PPP conversion factor, GDP, World Bank, base year: 2011.

Procurement estimates can be broken down by government sector, if one is willing to maintain a constant expenditure breakdown. We highlight the education and health sectors' direct expenditures on produce and foodstuffs. Using the latest figures available (2009) on share of expenditure by destination, Table 18 points out that government expenditure on food and agricultural products for education reached approximately BRL6 billion in 2013. This figure is consistent with the reported expenditure, implementing agencies' counterparts and total annual budget for 2013 from Table 8 above, around BRL5.4 billion for that same year. What our estimates reveal is that the larger part of the PNAE's expenditures is on food products—i.e. goods from the food industry. Around a tenth of this amount is obtained directly from agricultural economic units.

Nevertheless, the potential for income generation for agricultural producers from structured demand can be significant. An important contribution made by this report is to estimate how much the purchase of food industry inputs generates demand from the agricultural sector. As seen in Table 13, food purchases generate indirect effects on agriculture of around 40–50 per cent of the food expenditure, depending on the reference year. The indirect effect of food procurement by use (education and health) can be estimated by breaking down the extrapolated differences between direct purchases and total purchases using the constant share assumption. The figures are impressive: while the direct structured demand for agricultural products from family farmers is estimated at BRL516 million in 2013, indirect structured demand could reach more than BRL5 billion. These figures are detailed in Table 20.

TABLE 18

Estimates of institutional procurement of agricultural and food industry output for education
(nominal values in BRL millions, and USD PPP)

Year	Direct agricultural purchases		Direct food purchases	
	Nominal BRL	USD PPP	Nominal BRL	USD PPP
2003	87.3	89.6	899.5	922.8
2004	99.1	95.8	1,011.7	977.9
2005	119.1	109.6	1,212.0	1,115.2
2006	150.1	134.3	1,515.1	1,356.0
2007	210.7	179.3	2,127.8	1,811.0
2008	246	196.6	2,466.4	1,971.4
2009	345.9	265.6	3,456.7	2,653.8
2010	376.6	271.6	4,379.3	3,157.9
2011	423.8	288.1	4,515.9	3,069.8
2012	435.9	279.0	5,127.2	3,281.9
2013	516.1	312.9	5,510.0	3,341.1

Note: 2003–2009: Table 14 (Education) and Table 15 (Education); 2010–2013: Table 14/15 2009 share of Table 17 figures. PPP conversion factor, GDP, World Bank, base year: 2011.

TABLE 19

Estimates of institutional procurement of agricultural and food industry output for health
(nominal values in BRL millions, and USD PPP)

Year	Direct agricultural purchases		Direct food purchases	
	Nominal BRL	USD PPP	Nominal BRL	USD PPP
2003	14.5	14.9	266.4	273.3
2004	20.3	19.6	324.7	313.9
2005	23.2	21.3	376.7	346.6
2006	22.3	20.0	364.4	326.1
2007	31.9	27.2	505.0	429.8
2008	37.7	30.1	608.1	486.1
2009	44.5	34.2	706.0	542.0
2010	48.5	35.0	894.4	645.0
2011	54.6	37.1	922.3	627.0
2012	56.1	35.9	1,047.1	670.3
2013	66.4	40.3	1,125.3	682.4

Note: 2003–2009: Table 14 (Agriculture) and Table 15 (Food); 2010–2013 Table 14/15 2009 share of Table 17 figures. PPP conversion factor for GDP from the World Bank, base year: 2011.

TABLE 20

Estimates of direct and indirect institutional purchases from agriculture
(in BRL millions, nominal values)

Year	Direct domestic purchases from agriculture	Indirect domestic purchases from agriculture	Total domestic agriculture purchases
	(A)	(B)	(C)
2003	295.77	1,990.7	2,286.5
2004	330.24	2,141.6	2,471.8
2005	389.55	2,377.1	2,766.6
2006	438.49	2,482.4	2,920.9
2007	498.91	2,888.8	3,387.7
2008	589.90	3,458.9	4,048.8
2009	650.34	3,459.2	4,109.6
2010	708.02	3,766.0	4,474.1
2011	796.84	4,238.5	5,035.4
2012	819.53	4,359.2	5,178.7
2013	970.32	5,161.2	6,131.6

Source: Authors' estimates. 2003–2009 (National Accounts); 2010–2013 see Table 11 and Table 17 for column (C). Same method used for column (A). Column (B) obtained as the difference between (A) and (C).

5 CONCLUDING REMARKS

Brazil's experience with government-led institutional food procurement can shed some light on the worldwide debate around rural development policies. This report documents the scale of government-based structured demand in Brazil and describes the evolution of the PAA and the PNAE, which are the largest programmes with earmarked funds for food procurement directly from family farmers and their organisations.

Institutional procurement from family farmers started in 2003 with other policies to promote food security, alleviate hunger and support family farmers. The success of such policies led to the unparalleled inclusive growth in agriculture witnessed throughout the last decade. A significant reduction in poverty among the population could be observed, including among rural households whose main source of income is agriculture. Despite the improvement in average income, about 22.9 per cent of the rural population still lived below the poverty line (measured as the upper eligibility line for the *Bolsa Familia* programme) in 2013. In contrast, the poverty rate for the overall population was only 9 per cent.

Institutional procurement from family farmers has not yet reached its full potential, the expansion in food purchases since 2003 notwithstanding. However, there are mechanisms that have been put in place to boost the flow of resources—through the PAA—as well as performance improvements—through the PNAE—to increase market access to structured demand for family farmers.

The PNAE reform that established a minimum of 30 per cent to be spent on food purchases from family farmers is fairly recent. In 2013, 30 per cent of the federal government funds transferred to the executing agencies would amount to BRL1.16 billion; however, actual purchases from family farmers represented less than half this sum (BRL564 million). Therefore, there were still financial resources amounting to BRL598 million that could have been spent on

purchases from family farmers in 2013. Even if this nominal value is overestimated—as it is based on reported information from the executing agencies—it is important to consider that the amount available through the PNAE for family farmers was not fully utilised to purchase from them. Once executing agencies start purchasing, it seems that, on average, the 30 per cent threshold required by the legislation can be achieved. The fact that about 40 per cent of the executing agencies still do not report any purchases from family farmers remains a problem. Further studies to determine the amount of red tape involved in making purchases from family farmers could improve the performance of the PNAE's institutional public procurement process.

Even though the expansion of the PAA was put on hold with a decrease in expenditure in 2013, it does not reduce the importance of food procurement via the programme. It has a complex modus operandi to meet the demands of the most vulnerable family farmers and food-insecure populations. The PAA purchases comprise six different modalities, each with its own rationale, as previously explained. The fall in PAA expenditures demonstrates that even a programme that has existed for over 10 years may need adjustments to its operation. The public food procurement process involves different mechanisms such as payment systems, delivery processes and supply of food. Adjustments to standardise procedures may have caused the programme's expansion to slow down (Ipea 2013). This can be clearly observed with Conab Resolution No. 62/2013, for instance, which specifies and tightens the rules related to food assistance. It also demands more transparency: organisations must provide payment receipts for all the farmer beneficiaries and promote the diversification of producers with an additional cap established for purchases from organisations (cooperatives or associations).

Lessons can be learned from the Brazilian structured demand policies. The coverage of family farmers by the PAA and the PNAE might be modest in comparison to the sheer number of family farmers in Brazil. The national registry of family farmers includes over 5 million family farmers who can benefit from institutional food procurement. Increasing coverage may require setting up a two-tiered system integrating smallholders into markets: one for established farmers who can provide a steady supply of products, and one for subsistence farmers who still need to create a surplus.

In the last section of this report, we highlighted that the scope of structured demand for farmers in Brazil reaches beyond direct purchases of agricultural produce by the government. In fact, a much greater impact of government procurement on agriculture is indirect, through the demand for processed foods. This indirect effect could be larger if farmers—through cooperatives—participated in basic food processing, such as rice peeling, bean extraction and packing. An important issue raised by this study is the capacity of small farmers to reach the food industry; this could be very important to generate sustainable income. On the other hand, if only large and medium-sized farmers supply the food industry, a very significant opportunity for structured demand to reach small farmers is being missed. The potential for income generation from structured demand can be significant for small-scale agricultural producers.

The waiver of competitive bidding is a key feature of both programmes. By means of a recently added mechanism in the PAA, any government organisation can procure food using a 'soft' bidding process. Thus, PAA expenditures can encompass the Brazilian government's entire food budget. Nonetheless, as shown above, the government's participation in the agricultural market is less than 2 per cent. Most of the government food procurement is of products that require some level of processing. Thus, an increase in government procurement targeted at family farmers must not overlook how to better link them with the food industry.

APPENDIX

We present the estimates for both direct and indirect government food purchases based on National Accounts in Brazil. To determine government purchases related to agricultural products, we considered direct purchases as those purchases from the following sectors: 'public education', 'public health' and 'other government services'. Indirect purchases are considered to be monetary purchases of industrialised foodstuffs (beef, poultry, beef patties, white rice, wheat or other types of flour) that are derived from agriculture. While direct purchases are measured directly, indirect purchases are estimated.

Our basic sources are the National Accounts published by IBGE. They are based on the UN System of National Accounts of 1993 (see United Nations 2003). We extensively use the product/activity data from the SUTs (*Tabela de Recursos e Usos*—TRU).

The SUT present information on the total supply of the products listed—for example, total output of soy seeds, total output of soy cooking oil, at basic and consumer prices. Total supply is presented by industry source (crop production and fishing; ranch production; food manufacturing) for domestic output and imports.

Use of each product is broken down into intermediate consumption (when a good is used as an input for an agricultural sector output) and final demand (family or government consumption, investment or exports).

Based on the 56 industry classification tables, our estimates include industries 0101 (Crop Production and Forestry), 0102 (Ranch Production and Fishing)—which we designate as Agriculture—and industry 0301 (Food and Beverages Industry). These sectors supply food or use agricultural produce as inputs (such as soy beans to manufacture soy cooking oil). 'Government purchases' figures are based on industries 1201 (Public Education), 1202 (Public Health) and 1203 (Public Administration and Social Security), as well as final consumption by the government.

Products included in the estimates are those from 'agriculture' (0101xx, 0102xx),[17] excluding tobacco leaves (010108), and those from the food industry and animal slaughtering and processing (0301xx), including beverages (alcoholic or not),[18] henceforth called the 'food industry'. Tobacco products (030201) are excluded.

Two comments are required at this point. First, note that government purchases of food or produce for schools, resale or stocking are classified as government intermediate consumption. Government final demand for produce is not a reasonable classification, as it does not 'consume' lettuce but, rather, utilises it to provide services (e.g. school lunches). Even produce acquired to stock government-subsidised restaurants would be classified as intermediate inputs. Second, purchases from crop production and ranch production mean acquiring live cattle (*boi em pé*) or unprocessed rice. When beef is acquired through public procurement for schools, it has already been processed by the food industry (slaughterhouses), so we should see very little in terms of direct purchases from the agricultural sector, mostly limited to fresh fruits and vegetables.

We start by adding up government purchases of agricultural and food industry output:

$$DGP = \Sigma_i \Sigma_j \, CI_{ij} + \Sigma_i \, G_i \qquad (1)$$

Where i={0101xx, 0102xx, 0301xx} is a list of products, excluding tobacco leaves, j={1201, 1202, 1203} is a list of industries, and G is final demand by the government. We term this 'direct government purchases' (DGP).

However, some of these purchases might have been of imported produce. The SUTs do not discriminate intermediate input use based on origin, either domestic or foreign. We use a constant share hypothesis, used extensively when constructing input–output matrices from SUT data. Namely, we assume that the government purchases each output from domestic farmers and the food industry in the same proportion as aggregate domestic supply to total supply.

Declare m_i as the share of imports in total supply of a specific product ('product by product share'). Then $(1 - m_i)$ is the share of domestic output in the total supply of product *i*. Our first estimate is domestic product direct government purchases.

$$DDGP=\Sigma_i\Sigma_j CI_{ij}(1-m_i) + \Sigma_i G_i(1-m_i) \quad (2)$$

Alternatively, we use an average import share based on all 010xxx and 0301xx products and apply it to *DGP* calculated in (1).

In addition to these purchases, we should note that food industry outputs from government procurement actually derive from farmers and ranchers, as inputs must be acquired from this industry.

We calculate the extent of institutional procurement that derives from agriculture using constant input requirements of food industry outputs from agricultural products. For example, we calculate $a_{ifood}=CI_{ifood}/Y_{food}$, where Y_{food} is the total output from the food industry. The technical coefficient a_{ifood} indicates what the requirement is for input *i* to generate BRL1 unit of food industry output. Thus if, for instance, BRL2 of food industry output comes from government purchases, we estimate the agricultural product *i* output induced by the government purchase as BRL2*a_{ifood}. Our technical coefficient is adjusted for import share in output of good *i*; that is, our CI_{ifood} is multiplied by the imported share as above, thus

$\tilde{a}_{ifood}=CI_{ifood}(1-m_i)/Y_{food}$.

$$DIGP=\Sigma_i \tilde{a}_{ifood}DDGP_{food}\ , \quad (3)$$

where $DDGP_{food}$ is the direct domestic government purchase of food industry outputs—namely, the outcome from equation (2) when restricted to food products (i.e. goods classified as 0301xx).

On the one hand, these estimates do not include aggregate demand multipliers, as we are focusing on intermediate input purchases. On the other hand, these estimates include freight and retail margin losses that the producers incurred in order to sell their produce either directly to the government or indirectly, through the food industry's input sales.

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DATA SOURCES

IBGE – Sidra database <http://www.sidra.ibge.gov.br/> Tabela 3104: Índice de Preços ao Produtor, por tipo de índice e indústria de transformação e atividades.
IBGE – Sidra database <http://www.sidra.ibge.gov.br/> Tabela 3653: Produção Física Industrial, por seções e atividades industriais (Pesquisa Industrial Mensal)
IBGE – Sidra database <http://www.sidra.ibge.gov.br/> Tabela 1846: Valores a preços correntes (Contas Nacionais Trimestrais)
IBGE – Contas Nacionais, Tabela de Recursos e Usos, 2003–2009.
MDS – SAGI PAA data
<http://aplicacoes.mds.gov.br/sagi/paa/visi_paa_geral/pg_principal.php?url=abertura>
FNDE – PNAE expenses data

NOTES

6. Agricultural establishments are all production units dedicated, totally or partially, to farming, forestry or aquacultural activities, under a single administration: either a producer or an administrator. Regardless of their size, legal status or location in an urban or rural area, they have as their object production for subsistence and/or for sale and thus constitute a unit in the census Source: IBGE 2006

7. *Lei No. 4.504, de 30/11/1964*. This law regulates the rights and obligations pertaining to rural real estate, for the purposes of implementing the agrarian reform and promoting agricultural policy.

8. *Lei No. 8.629, de 25/02/1993*. This law provides for the regulation of constitutional provisions related to agrarian reform, provided for in Chapter III, Title VII of the Federal Constitution.

9. A fiscal module is the unit of agrarian measurement that represents the minimum size for an establishment to be considered economically sustainable. It was established by *Lei No. 6.746/1979*. A fiscal module is specified by each municipality and varies between 5 and 110 hectares. The smallest fiscal modules are in the South and Southeast regions of Brazil, metropolitan areas and seaside municipalities, with most fiscal modules spanning less than 30 hectares. In the North and Centre-West regions, a fiscal module can reach over 100 hectares (Embrapa 2012).

10. Based on the poverty threshold used by the Brazilian government in nominal values from June 2011, under which poor and extremely poor households possess an income of less than BRL140 and BRL70, respectively.

11. PPP figures were calculated using the December Consumer Price Index (IPCA), base year: 2011 from Ipea data and then converted into PPP using the World Bank conversion factor, GDP, base year: 2011.

12. Conab is the PAA's main implementing institution. It has also played a pivotal role in the regulation of food policies in Brazil. See Box 3 for more details.

13. It includes states from the Northeast region, the northern area of Minas Gerais and Vales do Jequitinhonha e Mucuri (*Resolução No. 61*, 23 October 2013).

14. Families registered in the Single Registry for Social Programmes of the Federal Government (*Cadastro Único*), beneficiaries from the Brazil without Extreme Poverty (*Brasil Sem Miséria*—BSM) plan and the National Agroecology and Organic Production Policy (PLANAPO).

15. This is a programme that gives extra resources to schools so as to allow them to move from part-time to full-time operation for their pupils. Most schools in Brazil operate in two or three shifts (morning, afternoon and sometimes evening). Schools that were beneficiaries of Bolsa Família are given priority to join this programme, which does not provide universal coverage.

16. Therefore, priority is given to the municipality, then neighbouring areas, before the food can be purchased outside this 'catchment area'. Larger metropolitan areas are likely to need to purchase from other areas of the state, or the country more broadly, due to their larger demand and the relative scarcity of agricultural production.

17. Namely, raw rice (010101), corn (010102), wheat and other cereals (010103), sugar cane (010104), soy grains (010105), other crop produce (010106), manioc (010107), cotton (010109, citric fruits (010110), coffee grains (010111), forestry and gathering products (010112), cattle and livestock (010201), animal milk (010202), live hogs (010203), live poultry (010204), eggs (010205) and fishery produce (010206).

18. Namely, cattle slaughtering and meatpacking (030101), pork meatpacking (030102), poultry processing (030103), seafood product preparation and packaging (030104), fruit and vegetable canning, pickling and drying (030105), soybean and other oilseed processing (030106), fats and oils refining and blending (030107), soybean cooking oil. (030108), fluid milk (030109), dairy products and ice cream (030110), peeled rice (030111), wheat flour milling (030112), manioc flour (030113), corn oil, starch and dog and cat feed (030114), sugar mills (030115), roasted coffee (030116), soluble coffee (0301170, other food products (030118) and beverages (030119).

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