



Curbing enthusiasm for Brazilian agribusiness: The use of actor-specific assessments to transform sustainable development on the ground



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ABSTRACT

Current enthusiasm for the potential of sustainable agricultural development must be based on a realistic assessment of the dynamics used by specific farming sectors. This study highlights the structural limitations that impede agricultural progress and explains why it is necessary to overcome these impediments in a case study of Brazil, one of the world's main agricultural exporters. In Brazil, the commodity-exporter large-farmers production chain is largely controlled by multinational corporations, with the investment of national capital a mere 12.4% in the technology-intensive sectors of the soy business (composed of seed production, fertilizers, pesticides, machinery, trading companies). The agricultural sector's future depends on increasing the share of national capital into domestic businesses and confronting the current and simplistic strategy of expansion into new agricultural frontiers, which often have high social and environmental costs. The future of family farmers depends on comprehensive development alternatives and challenging the current policies, since current development has been restricted to the 17.9% of family farmers who have access to rural credit, whom are mostly based in the Southern region of Brazil.

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1. Introduction

Recently, agricultural development has returned to the limelight in development studies and practice (Dethier & Effenberger, 2012; Wiggins, Farrington, Henley, Grist, & Locke, 2013). On the one hand, food production has to meet the needs of the growing population as their eating habits become more demanding (FAO, 2009; Tilman, Balzer, Hill, & Befort, 2011). On the other hand, there is the need for sustainable development, in particular for climate change mitigation and biodiversity conservation (Tilman et al., 2011). In this context, macro proposals such as sustainable intensification, as an alternative for sustainable agricultural development, are being designed and gaining popularity in political agendas (Franks, 2014).

Despite the development of conceptual proposals, an important part of the effort ultimately depends on farmers, who own the areas that serve for food production and conservation (Beck, 2016; Potter & Tilzey, 2007). Therefore, there is growing interest in assessing the

possibilities, but also the limitations, that farmers have for sustainable agricultural development, focusing on economic development, social development and environmental protection (Ingram, Gaskell, Mills, & Short, 2013; Medina, Almeida, Novaes, Godar, & Pokorny, 2015; West et al., 2014).

For many scholars, large farmers connected to global agribusiness are key players due to their scale of production, as well as to their potential for agricultural intensification (Goulding, Trewavas, & Giller, 2012). For others, diversified systems of family farmers have greater potential for sustainable development (Godar, Tizado, & Pokorny, 2012). Nevertheless, there is still limited knowledge about rural area actor-specific dynamics that can either favor or hinder sustainable agricultural development. Only a systematic assessment of the on-going dynamics can provide realistic insights on possibilities for sustainable agricultural development that can be used for designing effective policies (Escobal, Favareto, Aguirre, & Ponce, 2015; Godar, Suavet, Gardner, Dawkins, & Meyfroidt, 2016; Medina et al., 2015).

The need for an actor-specific assessment on the possibilities for sustainable agricultural development is particularly fundamental in Brazil, which is one of the main agricultural exporters in the world

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(Martinelli, Naylor, Vitousek, & Moutinho, 2010). Agricultural production accounts for 6.5% of the Brazilian Gross Domestic Product (GDP), and 22.5% if the whole agro-industry is taken into account (Cepea, 2013). The farming sector employs 16.5 million people (França, Del Grossi, & Marques, 2009) and, although the country has experienced a large rural exodus in recent decades, the number of rural households has been growing (Maia, Fideles, & Medina, 2016). Moreover, Brazil is an interesting case considering its ambitious voluntary dedication to reducing greenhouse gases emissions based mainly on curbing deforestation in the Amazon and promoting sustainable farming through the Low Carbon Agricultural Program (ABC), as presented during the COP 21 in Paris 2015 (Brasil, 2015b).

The Brazilian countryside is particularly dynamic (Lapola, 2013). In the last 20 years, trade liberalization has facilitated an unprecedented expansion of globalized agribusiness into the country (Saes & Silveira, 2014). Brazilian farmers have expanded production into new agricultural frontiers (Rada, 2013) which, in turn, have triggered governmental efforts to regulate its impacts such as deforestation (Soares-filho et al., 2014). Recently, the acknowledgement of family farmers needing assistance from the national government has led to promoting the modernization of the family farming sector based on subsidized agricultural credit, market integration and the adoption of new technologies (Medina et al., 2015).

Important steps have been taken towards understanding not only the macro-national dynamics (Delgado, 2014), but also the regional dynamics related to the modern rural system (Buainain & Garcia, 2013a,b). Nevertheless, there is no systematic characterization of the main dynamics critical to understanding the Brazilian rural areas that could assist with more informed decision making. This article aims to critically assess the opportunities for sustainable agricultural development in Brazil through a better understanding of the ongoing actor-specific dynamics. Specifically, this study aims to: 1. Characterize the main actor-specific driven dynamics; and 2. Critically assess the possibilities, and also the challenges, that each actor represents for sustainable agricultural development.

2. Methodology

The main actor-specific driven dynamics of the Brazilian countryside were identified based on a literature review in which the classical studies on the dynamics of the Brazilian countryside were revisited and a systematic revision of the published papers (by the most important journals in this area for the last five years) was conducted. Additionally, field research was carried out between 2010 and 2016 in the North and Central-West regions of the country, as these regions are particularly dynamic and still poorly understood (Damien, Isabelle, Christovam, Nicolas, & Vincent, 2017; Lapola, 2013). The field research focused on understanding the farmers' agricultural systems and their recent dynamics (Gosch, Ferreira, & Medina, 2016; Medina & Barbosa, 2015; Medina, Ribeiro, & Brasil, 2016; Medina et al., 2015). As a result, two main categories of actors were taken into consideration: 1. The commodity-exporter farm sector, including large farmers and agro-industry; and 2. The family farmers sector, which includes small farmers with less than four fiscal modules (whose area varies according to the county, as defined by Brazilian Law 6.746/1979), as well as: gatherers, small fishermen and indigenous peoples, (as defined by Brazilian Law 11.326/2006).

Adding to the literature review, official databases available at the county and state levels were used to characterize the corresponding dynamics (Table 1). Different sources of information were used and in some cases combined. The most recent data available

for each variable was used, as official databases for each aspect is not always available for the same year. For some of the aspects, particularly data regarding family farming at the national level, the 2006 Agricultural Census is the most recent comprehensive source of data available. The fact that this data was collected more than 10 years ago limits the possible inferences about current dynamics, but they are the best ones available now and for the next few years (as a new National Census has still not been completed). Regarding the commodity-exporting farm sector, the study focused on soybean producers, giving their recent expansion throughout the country, and sought to assess the implications of soybean production on land-related conflicts and deforestation. Although cattle ranching is the largest land use and sugar and coffee are valuable exports, soybean has experienced the greatest expansion recently (Jusys, 2017). Regarding family farmers, the study focused on the implications of access to lines of credit, as well as to developing alternatives for farmers' income performance.

In addition, maps with the greatest potential for explaining the studied dynamics were prepared for the spatial visualization of the key variables. The maps were made at the county level for all of Brazil using the free software, *Quantum GIS*.

3. Results

3.1. Commodity-exporter large farmers' driven dynamics

3.1.1. Consolidation

According to the latest Brazilian Agricultural Census in 2006, from the 329 million hectares of privately owned land in Brazil, 75.7% are occupied by 0.8 million medium and large-scale farmers (IBGE, 2006). Therefore, this is a strategic sector for the promotion of sustainable agricultural development. Particularly large-scale farmers tend to be part of the commodity-exporting sector which is already consolidated in the South and the Southeast regions of Brazil (Saes & Silveira, 2014). In the last few decades, this sector has also become consolidated in the Central-West region, mainly in the Cerrado biome (Osaki & Batalha, 2014; Rada, 2013). The large scale of production has also made it possible for the establishment of agro-industry plants for processing soybean, sugar, beef and chicken (Sedyama, Castro Júnior, De Calegario, and Siqueira, 2013). Recent production growth in regions where agribusiness is already consolidated has come mostly from increased productivity rather than from expansion into new farming areas (Gasques, Bastos, Valdes, & Bacchi, 2014).

One of the most well-known cases of commodity-exporting farm sector consolidation has happened in the state of Goiás, based on soybean production. In Brazil, soybeans are grown on 30 million hectares (Table 2, column 1.1), accounting for 8.9% of the total farmed area (Espíndola & Cunha, 2015). And the states of Mato Grosso, Paraná, Rio Grande do Sul and Goiás are the largest producers (Espíndola & Cunha, 2015). Goiás produces 8,994,900 tons of soybeans per year and its local legislation promotes local processing of at least 30% of its total production (given credit 7% VAT according to the ordinance 169/2014/GSF). Currently, 63% of the soybeans produced in Goiás are locally processed into meal, oil, or animal feed and only 37% are exported. Goiás has processing plants with the capacity for processing 7.887 million tons of soybean per year, in the plants of 10 private companies, including: Comigo, Caramuru and Granol (Table 2, column 1.2). This is vastly different from its neighboring state of Mato Grosso, which is the largest domestic soy producer, but exports most of its grain as raw material.

This study has mapped the soybean consolidation defined as counties that have remained as important producers and counties that have increased their planted areas, when comparing data from

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