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Sugarcane Industry Expansion and Changing Land and Labor Relations in Brazil.

The Case of Mato Grosso do Sul 2000–2016

By Kristina Lorenzen

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Bioeconomy & Inequalities

Friedrich-Schiller-University Jena
Institute for Sociology
BMBF Junior Research Group
Bioeconomy and Inequalities

Bachstraße 18k
07743 Jena, Germany
T +49 | 36 41 | 9-4 50 56
F +49 | 36 41 | 9-4 50 52

bioinequalities@uni-jena.de
www.bioinequalities.uni-jena.de

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Kristina Lorenzen

Sugarcane Industry Expansion and Changing Land and Labor Relations in Brazil. The Case of Mato Grosso do Sul 2000–2016

Abstract

The objective of this paper is to assess how the expanding production of sugarcane-based bioethanol as part of an emerging bioeconomy affects existing social inequalities in land and labor relations. A case study method was used to look at the growing sugarcane industry in Mato Grosso do Sul during the period 2000–2016. Social inequalities and agrarian political economy constituted the analytical framework for the research and data analysis of the study. The paper shows that the expansion of the sugarcane industry in Brazil was driven by an interconnection between global dynamics including land grabbing processes and green development discourses, on the one hand, and national policies to foster bioethanol production, on the other. The expansion of the sugarcane industry in Mato Grosso do Sul transformed existing labor regimes. Some of the most striking changes were the increased but temporary semi-proletarianization of peasants in agrarian reform settlements and the double exclusion from land and wage labor of the Guarani and Kaiowá Indigenous people.

Biographical note

Kristina Lorenzen is a Latin Americanist (MA) and researcher in the Junior Research Group Bioeconomy and Inequalities funded by the German Federal Ministry of Education and Research (BMBF). Her current research, as well as her PhD thesis, focus on the topic of labor and land relations in the Brazilian sugarcane sector.

Keywords: Bioeconomy, biofuels, labor relations, land relations, land access, sugarcane

Kristina Lorenzen

Expansion der Zuckerrohr-Industrie und veränderte Land- und Arbeitsverhältnisse in Brasilien. Am Beispiel von Mato Grosso do Sul 2000–2016

Abstract

Dieses Working Paper analysiert, wie die Expansion der brasilianischen Zuckerrohr-Industrie die Land- und Arbeitsverhältnisse verändert hat. Die Frage wird am Fall des brasilianischen Bundesstaats Mato Grosso do Sul im Zeitraum 2000-2016 untersucht. Der analytische Rahmen verbindet eine soziologische Ungleichheitsperspektive mit der kritischen Agrarforschung und stellt dabei das Konzept der ländlichen Arbeitsregime ins Zentrum, in denen Lohnarbeit und Subsistenzproduktion zusammengedacht werden. Das Working Paper zeigt zunächst, dass globale Dynamiken, wie Land Grabbing sowie grüne Entwicklungsdiskurse einerseits und nationale Fördermaßnahmen zur Bioethanolproduktion andererseits, die Expansion der Zuckerrohr-Industrie in Brasilien angestoßen haben. Darüber hinaus kommt es zum Ergebnis, dass hinsichtlich der Veränderungen in den Arbeitsregimen die Semi-Proletarisierung der Bäuer_innen in Agrarreform-Siedlungen und die zweifache Exklusion von Land und Lohnarbeit der Indigenen der Guarani und Kaiowá zu verzeichnen sind.

Kurzbiographie

Kristina Lorenzen ist Lateinamerikanistin (M.A.) und wissenschaftliche Mitarbeiterin der BMBF-Nachwuchsgruppe „Bioökonomie und soziale Ungleichheiten“. Der Fokus ihrer aktuellen Forschungsarbeit sowie das Thema ihrer Promotion sind Arbeits- und Landverhältnisse im brasilianischen Zuckerrohr-Sektor.

Schlagworte: Bioökonomie, Biokraftstoffe, Arbeitsverhältnisse, Landverhältnisse, Landzugang, Zuckerrohr, Brasilien

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Abbreviations

Agraer - Agência de Desenvolvimento Agrário e Extensão Rural // Agency for Agricultural Development and Rural Extension

CIMI - Conselho Indigenista Missionário // Indigenous Missionary Council

CPT - Comissão Pastoral da Terra // Pastoral Land Commission

CTB - Central dos Trabalhadores e Trabalhadoras do Brasil // Central of the Brazilian Workers

CUT - Central Única dos Trabalhadores // Unified Workers' Central

DIESSE - Departamento Intersindical de Estatística e Estudos Socioeconômicos // Inter-Union Department of Statistics and Socio-Economic Studies

EMBRAPA - Empresa Brasileira de Pesquisa Agropecuária // Brazilian Company for Research in Agriculture

FAF - Federação da Agricultura Familiar // Federation of Family Agriculture

FETAGRI - Federação dos Trabalhadores na Agricultura // Federation of Workers in Agriculture

FETTAR - Federação dos Trabalhadores na Agricultura do Estado de MS // Federation of Agricultural Workers in the State of Mato Grosso do Sul

FNL - Frente Nacional de Lutas no Campo e Cidade // National Front of Resistance in the Countryside and in the City

FUNAI - Fundação Nacional do Índio // National Foundation for Indians

INCRA - Instituto Nacional de Colonização e Reforma Agrária // Agrarian Reform Authority

MAF - Movimento de agricultura familia // Movement of Family Agriculture

MCLRA - Movimento Camponês em Luta Pela Reforma Agrária // Peasant Movement in the Fight for Agrarian Reform

MPE – Ministério Público Estadual // Federal State Public Prosecution

MPF – Ministério Público Federal // Federal Public Prosecution

MPL - Movimento Passe Livre // Free Fare Movement

MPT - Ministério Público do Trabalho // Public Prosecution for Labor Rights

MST - Movimento dos Trabalhadores Rurais Sem Terra // Landless Workers' Movement

OLT - Organização Luta Pela Terra // Organization for the Struggle for Land

Proálcool - Programa Nacional do Álcool // National Ethanol Program

RAIS - Relação Anual de Informações Sociais // Yearly Overview of Social Information

SEMAGRO - Secretaria de Estado de Meio Ambiente, Desenvolvimento Econômico, Produção e Agricultura Familiar // State Secretariat of the Environment, Economic Development, Production and Family Agriculture

SPI - Serviço de Proteção aos Índios // Service for the Protection of Indians (now the FUNAI)

1 Introduction: Bioeconomy, the Brazilian Sugarcane Industry and Social Inequalities

One important strand of the bioeconomy focuses on the replacement of fossil energy with renewable energy sources and the better use of these natural resources through biotechnical innovations (see Backhouse et al. 2017, p. 8). The transformation towards the bioeconomy is supposed to respond to challenges such as food security, scarcity of resources, dependence on fossil fuels, and climate change. At the same time, its aim is to create sustainable economic growth and new employment opportunities (BMBF 2010, preface; Goven and Pavone 2015, pp. 1–5). In this sense, the bioeconomy represents a future vision (Goven and Pavone 2015, p. 5), whose actual realization and societal consequences are difficult to predict. The present paper thus focuses on bioethanol, the production and use of which preceded the bioeconomy discourse and is therefore already fully implemented. Agrofuels such as bioethanol, and bioenergy in general, are being integrated into bioeconomy agendas (Backhouse et al. 2017, pp. 23–26).

Brazil is one of the most important players in the field of agrofuels. As early as the 1970s, Brazil had established market-scale bioethanol production based on sugarcane and today it is the second largest producer of bioethanol worldwide (REN21 2018, p. 25; Wilkinson and Herrera 2010, p. 750). The Brazilian Science, Technology and Innovation Strategy[1] considers the promotion of agrofuels to be an important part of the Brazilian bioeconomy (MCTIC 2016, pp. 94–97). The most recent expansion of the Brazilian sugarcane industry started around 2002 and was closely linked to the promotion of bioethanol production. The current paper uses this expansion as an example of the emergence of a Brazilian bioeconomy to illustrate possible consequences and impacts. The expansion occurred in the context of a green development discourse (similar to the bioeconomy discourse), in which the Brazilian government started to implement specific measures to promote Brazilian bioethanol as a green alternative for the transport sector in the wake of the Kyoto protocol. One of these measures was the *Protocolo Agroambiental* (Agro-Environmental Protocol), which aimed to prohibit the practice of preharvest burning of sugarcane. The burning facilitates the subsequent harvest but releases too much carbon dioxide (CO_2) for a green, sustainable energy solution. Therefore, the *Protocolo Agroambiental* established the gradual elimination of the practice by 2017, which led to a mechanization of the sugarcane harvest (Brunner 2017, pp. 5–6; Embrapa Meio Ambiente 2014, pp. 1–2; Wilkinson 2015, pp. 2–3).

Previous research shows that the monocultural expansion of sugarcane can, on the one hand, create new employment opportunities, but, on the other hand, it can also

[1] Brazil has not yet developed a dedicated bioeconomy strategy. The Harvard Business Review issued the publication "Bioeconomy - An Agenda for Brazil" (Harvard Business Review 2013) on behalf of the National Industry Association CNI. The Ministry of Science, Technology, Innovation and Communication (MCTIC) addresses the bioeconomy in its "National Strategic Plan 2016-2022" (MCTIC 2016).

result in peasant displacement and land conflicts (Borges et al. 1983, pp. 90–104). However, the expansion, which started around 2002 was also accompanied by the ongoing mechanization of the agricultural part of the sector, which, in the state of São Paulo, led more to workforce reduction than job creation (Brunner 2017, pp. 7–8). It must also be taken into consideration that the Brazilian sugarcane sector has been associated with social inequalities since colonial times. In fact, sugar was the first major export product of the Portuguese colony. During the colonial era, high land and income concentration with large-scale monocultures and slave labor became the norm (Baer 2014, pp. 14–16; Furtado 2007, pp. 75–82; Sauer and Leite 2011, pp. 1–4). These unequal social relations continue to shape the dynamics of land relations in general as well as the working conditions in the Brazilian sugarcane sector.

Against this background, and given that the sugarcane sector is closely linked to the development of bioethanol, this paper asks: **How does the expanding production of bioethanol — as an important segment of the emerging (Brazilian) bioeconomy — affect existing social inequalities in labor and land relations?**

This research uses a case study approach (see Yin 2009) and the constructivist grounded theory methodology (Charmaz 2014) to understand the complex interrelationship between structural change in the sugarcane industry and social inequalities. The selected case is the expansion of sugarcane which started in Brazil around 2002. The study used a literature review, quantitative data, and field research to answer the research questions. This paper thus draws on a wide variety of sources and presents information from a literature analysis and statistical data to then conduct a more in-depth examination of the results of the fieldwork. The fieldwork was conducted in April 2017, between November and December 2017, and between April and June 2018. The methods used for the field research were open and semi-structured interviews, informal conversations, and (participatory) observations. I largely adopted a cross-perspective approach, meaning that a diverse group of individuals from civil society (social movements, non-governmental organizations, labor unions, and peasants), academia, the state and the private sector, at national, regional and local level, was interviewed (see annex for a List of Interviews; see Backhouse 2015, p. 28). The geographical focus of the field research was the central south of the Brazilian federal state Mato Grosso do Sul. I focused on especially those municipalities where the sugarcane industry (production units and/or sugarcane fields) was installed for the first time to provide an insight into the effects of its first emergence. The field research included the municipalities Dourados, Ponta Porã, Caraapó, Laguna Carapã, and Glória de Dourados.

This paper is a work in progress and has the methodological objective of structuring gathered data, exploring analytical perspectives, and drawing initial conclusions. Having outlined the research focus, question, and methodological procedure in the introduction, the paper moves on to discuss the state of the research in Chapter 2, followed by the analytical framework in Chapter 3, and a description of the methodology in Chapter 4. In Chapter 5, the sugarcane sector in Mato Grosso do Sul and recent

changes in that sector are outlined. Subsequently, Chapter 6 presents the transformation of land and labor relations resulting from the sugarcane industry expansion. Chapter 6 summarizes the results enabling me to draw final conclusions.

2 State of Research: Sugarcane Industry Expansion and Land and Labor Relations in Brazil

Commercial-scale production of bioethanol started in Brazil in the 1970s with the introduction of the National Alcohol Program *Proálcool* (*Programa Nacional do Álcool)* (Wilkinson and Herrera 2008b, p. 10). In 1983, Borges et al. published a comprehensive evaluation of the *Proálcool* program taking into account the impact on land and labor relations. They concluded that the expansion of the sugarcane sector due to the production of ethanol leads to positive employment effects, but that these effects are partly offset by displacement effects. Whenever the expansion did not take place on pastureland or vacant land, but rather on arable land, there was a risk of peasant displacement (1983, pp. 90–104). Borges et al. also doubted that the living conditions of peasants could be improved by integrating them as wage workers in the sugarcane industry. When displacements occurred, peasants lost their land and with it their (non-monetary) income components from small-scale farming. These loses were inadequately compensated by the wage labor in the sugarcane industry, since the terms of employment were characterized by informality, seasonality and low pay. This early study of the sugarcane sector shows how important it is to look at labor and land relations together to understand the impact on social inequalities. Many people living in the Global South are only able to secure livelihoods by combining different income resources from wage and non-wage work (so-called semi-proletarianization, see Boatcă 2016, chap. 2). In rural areas, land and labor relations do not change independently, but in close interaction.

Since Borges et al. published their evaluation, the sugarcane industry has led a "roller-coaster existence" (Wilkinson 2015, p. 2), with crises in the years 1985–2000, the boom years between 2003 and 2009, crisis and stagnation between 2010 and 2014 and slow recovery beginning in 2014 (Wilkinson 2015, pp. 2–3; Wilkinson and Herrera 2008b, p. 10). Nevertheless, the area of sugarcane cultivation continued to grow — from 2,768,514 ha in 1980 to 10,245,102 ha in 2016 (UNICADATA). The boom years of the sugar industry in the early 2000s led to an expansion of sugarcane cultivation and rising land prices in the main area of cultivation, the federal state of São Paulo. Investors moved to the neighboring states of Minas Gerais, Goiás, Mato Grosso and Mato Grosso do Sul[2] (Assunção et al. 2016, p. 6; Sant'Anna et al. 2016a, p. 174; Wilkinson

[2] Until 2016, São Paulo's share of national ethanol production dropped from 65 percent to 48 percent, while at the same time the share accounted for by the neighboring states increased. Increase in the shares of national bioethanol production between 2000 and 2016: Minas Gerais from 5 percent to 10

and Herrera 2008b, p. 11). Developments since the 2000s have had a major impact on land and labor relations, with two trends coming to the fore: First, the **displacement and concentration effects** generated by the expansion of sugarcane plantations and, second, the **mechanization** of sugarcane harvesting as a way of eliminating burning practices.

The expansion went hand in hand with large-scale land acquisitions, which are not new in Brazil, but increased after 2002. This can be understood as part of global land grabbing dynamics (see Chapter 5). The sugarcane sector – together with the soybean sector – were the most important industries for these land deals (Borras et al. 2011, 9, 17; Sauer and Leite 2011, p. 1; Wilkinson et al. 2012, p. 426). In the expansion areas of São Paulo, Minas Gerais, Goiás and Mato Grosso do Sul, cattle breeding and milk production and, to a lesser extent, small-scale food production has been displaced (Andre Novo et al. 2010 in Borras 2010, p. 582; Sauer and Leite 2011, p. 13; Wilkinson et al. 2012, p. 430; Wilkinson and Herrera 2008a, p. 8; Wilkinson and Herrera 2008b, pp. 25–26). In addition to the displacement of peasants, Sauer and Leite (2011, pp. 5–6) point to another line of conflict. According to the 2nd National Plan of Agrarian Reform 2005, around three million peasants with less than 10 ha do not have enough land to earn sufficient income to guarantee a minimum standard of living. Another three million rural families have no land at all. However, the high demand for land leads to increased land prices, which in turn makes a (re-)distributive agricultural policy and land recognition for landless people, Indigenous and traditional communities even more difficult (Borras et al. 2011, p. 37; Sauer and Leite 2011, pp. 5–6).

As well as peasant displacement and increasing land concentration, mechanization is the second dynamic that has changed the sugarcane sector since the 2000s. The sector began the process of mechanization in 2002 through the Agro-Environmental Protocol (Embrapa Meio Ambiente 2014). In addition to the CO_2 reduction targets, this also has an impact on labor relations. The sector is infamous for its poor working conditions, and cases of child and slave-like labor[3] have been repeatedly exposed (Carstensen 2013; Pauletti 2014; Repórter Brasil 2014). However, mechanization demands higher-skilled workers, which has led to better working conditions (Balsadi in Wilkinson and Herrera 2008a, p. 9). Having said that, it is estimated that one harvesting machine replaces up to 100 workers. In São Paulo, between 2004 and 2014 approximately 110,000 people lost their jobs in the manual harvest, while only 19,000 new jobs were created for truck drivers and machine operators (Brunner 2017, pp. 7–8). Between 2006 and 2014, the average education level of workers in the agricultural part of the sugarcane

percent; Goiás from 2 percent to 16 percent and Mato Grosso do Sul from 3 percent to 9 percent (UNICADATA).

[3] According to the Brazilian Criminal Code, slave-like work is defined as comprising the following elements: inhumane working conditions (violation of fundamental rights), forced labor, bonded labor and/or workloads that are hazardous to health or even life-threatening (Repórter Brasil 2017).

industry (plantation and harvesting) increased. Laborers employed in mechanized agriculture showed a higher level of education than manual laborers (Baccarin 2016, pp. 159–160). It is therefore very likely that job losses particularly impacted those workers with a low level of education.

In sum, available research has taken into account how land and labor relations change due to the expansion and mechanization of the sugarcane industry in Brazil. This research provides us with deeper insights into the impacts of bioethanol expansion as part of an emerging (Brazilian) bioeconomy. Nevertheless, more research is needed to understand the impacts of the most recent sugarcane industry expansion, which started around 2002. So far there are no comprehensive studies that look systematically at both the increasing land concentration, which appears to accompany sugarcane expansion, and the dynamics of mechanization. Thus, there is a lack of insight into how sugarcane expansion has changed social inequalities since the 2000s. A number of open questions remain:

1) Does peasant displacement occur due to sugarcane expansion? Are peasants integrated into the expanding sugarcane sector as wage laborers?
2) Does the (mechanized) sugarcane industry still create new jobs? If not, what alternative income opportunities do people find?

Furthermore, most research regarding the sugarcane sector still focuses on the federal state of São Paulo, even though sugarcane has spread to the neighboring states of Goiás, Mato Grosso do Sul, Minas Gerais and Paraná.

3) What are the impacts of sugarcane industry expansion in non-traditional regions? Do the impacts differ (land concentration, cattle displacement, job losses) from what the literature shows about São Paulo? This is an important question if we want to fully understand the impacts of bioethanol and bioeconomy expansion not only in traditional biomass regions but also in regions that might see biomass cultivation and processing for the first time if its demand grew.

3 Analytical Framework: Social Inequalities and Agrarian Political Economy

My research is situated in the field of sociological research on social inequalities. I understand **social inequalities** as the systematic asymmetrical and hierarchical access of groups to, for example, economic goods (work, income) and natural resources (land), which leads to beneficial or disadvantageous living conditions (Kreckel 2004, p. 17; Solga et al. 2009, p. 15). Therefore, this approach centers not only on income inequalities, but also on inequalities in terms of security of livelihoods (Bernstein 2010, p. 2). The asymmetric access relates to the position of specific groups in the social structure,

which in turn is socially produced based on categories such as class, gender and race/ethnicity (Solga et al. 2009, pp. 15–19). Moreover, I acknowledge that social inequalities do not evolve and change in a national container, but rather as a result of the interaction between global dynamics and historically rooted local social inequalities (Boatcă 2016, p. 2; Braig et al. 2016, p. 2; Dietz and Engels 2018).

In order to grasp the specific social inequalities of land and labor relations, I draw on agrarian political economy and especially on its conception of rural labor regimes. The analytical lens of rural labor regimes is especially valuable to this research given that it allows us to conceptualize the interrelationship between land and labor relations.

Agrarian political economy or **critical agrarian studies (CAS)** is a school of thought, action and research, which investigates "the social relations and dynamics of production and reproduction, property and power in agrarian formations and their processes of change, both historical and contemporary." (Bernstein 2010, p. 1; see also Edelman and Wolford 2017). The approach centers on the critical analysis of capitalism and provides a framework for examining topics such as divisions in access to land and labor, property, colonial legacies and relations of power and inequalities (Bernstein 2010, pp. 9–10). Most studies within CAS are based on Marx's political economy (Edelman and Wolford 2017, pp. 962–964).

In reference to Marx, (Bernstein 2010, pp. 21–26) points out that the most distinctive feature of capitalism is the social relation between capitalists, who own the means of production and extract surplus labor from workers, who in turn have to sell their labor power to make a living (exploitation). This basic understanding of capitalism has sometimes led to the idea that, in capitalism, all peasants will be dispossessed and proletarianized eventually to become wage laborers from whom surplus value will be extracted. This idea generalizes the English path from feudalism to capitalism and underestimates the complexities of social relations of global capitalism. However, drawing on Jairus Banaji, Bernstein goes on to argue that "capital is capable of exploiting labour through a wide range of social arrangements in different historical circumstances" and that categories such as "landless labour" and "small peasants" are fluid and that people move between those categories or occupy them at the same time. Proletarians are not the only labor type of labor that is exploited by capital and the dispossession of small peasants is not a compulsory component of capitalism (Bernstein 2010, pp. 33–34). The notion of capitalism as combining heterogeneous forms of wage and non-wage work has also been proposed by materialist feminists (see for e.g. Federici 2012, p. 40) and decolonial and world-system theories (for an overview see Boatcă 2016, chap. 2).

Proponents of the **materialist feminist subsistence approach** (see Werlhof et al. 1988) coined the term subsistence production or subsistence work for all work that is not wage labor. Following this approach, subsistence production is understood as

"production of life". Thus defined, subsistence production comprises a range of different human activities, including pregnancy and giving birth, the production, processing and preparation of food, making clothing, home-building, cleaning, as well as satisfying emotional and sexual needs[4] (Werlhof et al. 1988, p. 86). In the field of subsistence production, my research focuses on land-based activities such as non-wage agriculture, hunting and fishing. By examining the interrelationship between wage work and land-based subsistence production, I am able to gain deeper insights into the changes in land and labor relations.

The interrelationship between wage work and subsistence production results in different labor regimes such as semi-proletarianization, peasant production and proletarianization. The concept of labor regime refers to "different methods of recruiting labour and their connections with how labour is organized in production (labour processes) and how it secures its subsistence" (Bernstein 2010, p. 53). Semi-proletarianization describes incomplete proletarianization, where subsistence activities (peasant/marginal farming, petty trade etc.) are combined with wage work to ensure livelihoods (Boatcă 2016, pp. 65–66). Definitions of the term peasant vary, as do understandings of peasant production. For the purpose of this paper, I define it as production where the producers own or have access to their means of production (e.g. land) and where the production itself is mainly organized simply for the purposes of reproduction, often using only family labor (Bernstein 2010, 3-4, 53-55). Proletarians only possess their own labor force and no other means of production such as land. Proletarianization describes the creation of the proletariat which involves peasants being expropriated and integrated into wage work (Weyand 2014).

4 Methodology and Case Selection

The fundamental idea of this research is to use a case study approach (see Yin 2009) to make a preliminary appraisal of how land and labor relations could change if a transition towards the bioeconomy occurred. The case chosen here is the expansion of the sugarcane industry in the Brazilian federal state of Mato Grosso do Sul, which started around 2002. Insights from this study can help us to understand the potential effects of an emerging bioeconomy, which, like the Brazilian bioeconomy considers agrofuels to be an important pillar.

[4] Nowadays, the terms (social) reproduction work or care work are used more frequently, although the terms are often used interchangeably, or no unambiguous distinction drawn between them. However, Haubner (2016, pp. 93–94) points out that the term care work includes paid reproduction work (and therefore wage labor). For the purpose of this research, the concept of subsistence production described in the subsistence approach is used since it emerged specifically from the context of rural work in the Global South.

The case of Mato Grosso do Sul was selected due the pronounced expansion dynamics. Between 2005 and 2012, Mato Grosso do Sul had the highest percentage increase in harvested area of sugarcane from 8 to 22 production units (usinas). It received high levels of (international) investment targeting the sugarcane sector and it showed the highest potential for further expansion thanks to suitable land (Assunção et al. 2016, pp. 6–7; Sant'Anna et al. 2016a, p. 164; Wilkinson 2015, pp. 4–7). The state is one of the pioneers in the mechanization of sugarcane harvest[5]. Moreover, Mato Grosso do Sul is marked by significant social inequalities in terms of land and labor. It is one of the states with the highest land concentration in Brazil (IBGE 2006, p. 109) and the sugarcane sector is infamous for the slave-like labor conditions of the Indigenous people it employs (Pauletti 2014).

The geographical focus of the field research was the central south of Mato Grosso do Sul. I focused especially those municipalities where the sugarcane industry (production units and/or sugarcane fields) was installed for the first time to provide an insight into the effects of its first emergence. The field research included the municipalities of Dourados, Ponta Porã, Caraapó, Laguna Carapã and Glória de Dourados. The different municipalities were examined to give us an insight into the expansion effect as a whole rather than the variances in different places. The case study therefore used a single-case design (see Yin 2009, p. 46). To integrate the wider context into my research, I also conducted interviews with representatives of industry and social movements as well as with researchers in the capital of Mato Grosso do Sul, Campo Grande, and in São Paulo and Rio de Janeiro.

The research looks at the years between 2000 and 2016. The expansion of the sugarcane sector started around 2002, so the years 2000 and 2001 serve as a baseline. In 2016, the political context of Brazil changed dramatically, which also affected rural areas and their populations (through cuts in peasant programs, for example; see Nardoque et al. 2018). I therefore decided to limit my research to the year 2016. Going beyond this timeframe would confuse the effects of these particular political changes with the impacts of the expansion of the sugarcane industry on land and labor relations in the area of study.

The case study approach was embedded in the methodology of the constructivist grounded theory (CGT) by Charmaz (2014). Constructive grounded theory emphasizes the importance of an iterative approach. This means that, at the beginning of the research process, initial research questions, the theoretical perspective and a starting point are formulated, but they are subjected to constant adjustments and evolve with the construction and analysis of the data. In addition, the grounded theory provides

[5] For example, in 2013 it was reported that Mato Grosso do Sul was leading the implementation of the mechanization. 95 percent of the harvest in Mato Grosso do Sul was already mechanized, in São Paulo, the figure was only 87 percent (Barros 2013).

concrete strategies for the analysis and evaluation process, such as coding, memo writing and theoretical sampling (Charmaz and Bryant 2010, pp. 409–411).

The current research combined the use of different methods. This approach has the advantage of enabling us to compensate for potential distortions and disadvantages of one of the research methods through the use of alternative methods (Charmaz and Bryant 2010, p. 409; Gray 2010, p. 213). Methods such as explorative and semi-structured interviews, informal conversations and group discussions were complemented and contrasted with quantitative data and insights from a literature review. This paper therefore draws on a wide variety of sources and presents information from an analysis of the literature as well as statistical data to then conduct a more in-depth examination of the results of the fieldwork. The fieldwork was conducted in April 2017, between November and December 2017, and between April and June 2018.

During my fieldwork, I largely adopted a cross-perspective approach, meaning that a diverse group of individuals from civil society (social movements, non-governmental organizations, labor unions and peasants), academia, the state and the private sector, at national, regional and local level was interviewed (see annex for a List of Interviews; see Backhouse 2015, p. 28). In grounded theory, the analysis of the data is carried out continuously throughout the research process. During my research trips, the first analysis was performed using open coding, memo writing and reflection in a research diary (Charmaz and Bryant 2010, pp. 410–411; Gray 2010, p. 187). More detailed coding was carried out after the field trips. The insights from the coding, literature reviews and the analysis of quantitative data resulted in this working paper.

5 Actors, Roots and Causes: The Expansion of the Sugarcane Sector in Mato Grosso do Sul

Info Box: Mato Grosso do Sul – Basic Profile

Mato Grosso do Sul is located in the interior part of Brazil and belongs to the *Midwest (Centro-Oeste)* region. Mato Grosso do Sul is the sixth largest state in Brazil (357,145 km²). The capital is Campo Grande. With 2,748,023 inhabitants, it is sparsely populated (6.86/km²), particularly against the average Brazilian population density of 24.5/km². 83 percent of the population live in urban areas, 17 percent in rural locations.

61 percent of the population aged 16 or older have a formal job. The monthly nominal income per capita is 1,291 R$, which puts Mato Grosso do Sul in 7th place (of 27) when compared with the other states in Brazil. Agriculture, comprising cattle-raising, soybean and sugarcane cultivation and tree plantations, is the main economic activity.

Of Brazil's federal states, Mato Grosso do Sul has the second largest Indigenous population in the country. According to the Brazilian Census 2010, the Indigenous population in Mato Grosso do Sul amounts to 73,296 persons. This is nine percent of all the self-declared Indigenous people in Brazil and three percent of the population in Mato Grosso do Sul. The biggest ethnic group is the Guarani and Kaiowá.

Mato Grosso do Sul is one of the states with the highest land concentration in Brazil. Only two states in the northeast of Brazil (Maranhão and Alagoas) and Mato Grosso surpass Mato Grosso do Sul in terms of land concentration (IBGE 2006, p. 109).

Sources:

IBGE Cidades: https://cidades.ibge.gov.br/brasil/ms/panorama. Last accessed on 05/09/2018.

Governo do Estado do Mato Grosso do Sul: http://www.ms.gov.br/a-economia-de-ms/. Last accessed on 05/09/2018.

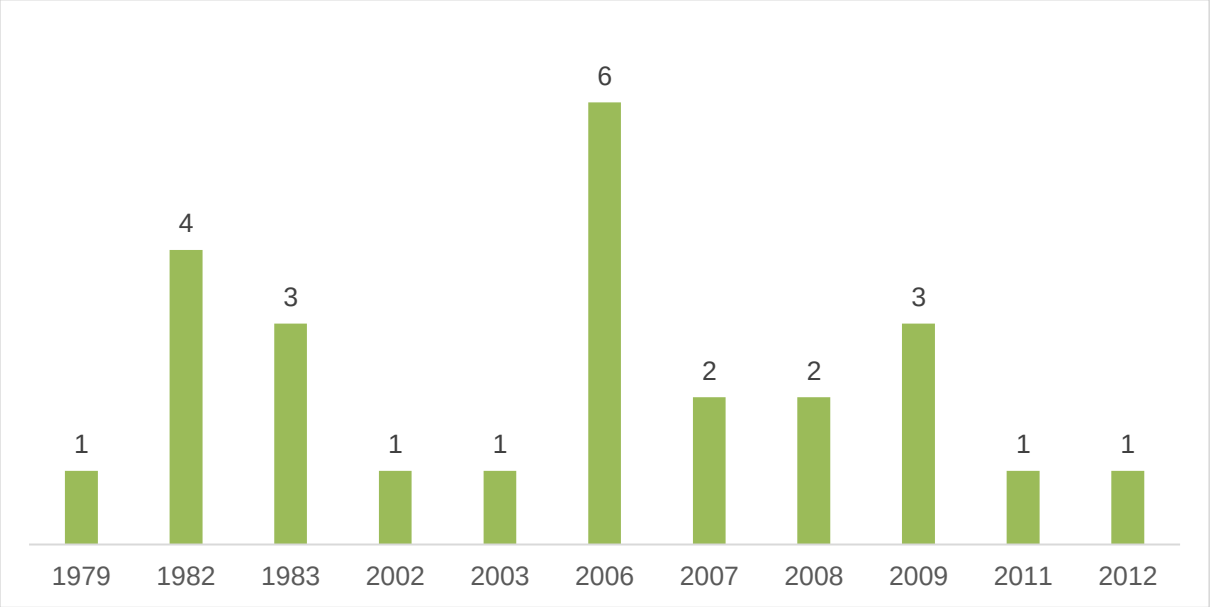
FUNAI: http://funai.gov.br/index.php/comunicacao/noticias/1069-entre-1991-e-2010-populacao-indigena-se-expandiu-de-34-5-para-80-5-dos-municipios-do-pais. Checked on 05/09/2018.

Between the 1960s and 1980s, the Brazilian military government fostered agro-industrial development and the expansion of the agricultural frontier. The government considered Mato Grosso do Sul to be one of the lesser developed regions and provided considerable incentives and investment for development. As part of the National Ethanol Program *Proálcool*, the government subsidized the establishment of industrial units (distilleries) in Mato Grosso do Sul for the production of ethanol from sugarcane (Missio and Vieira 2015, pp. 179–180). Eight units were installed between 1979 and 1983 and began commercial-scale production in 1984 (Domingues 2017, p. 76).

The most recent expansion of the sugarcane industry occurred in around 2002, and from 2005 to 2012, the federal state of Mato Grosso do Sul accounted for the highest proportional increase in sugarcane area. The number of production units rose from 8 to 22 (Figure 1). Low land prices, tax incentives, good infrastructure and the proximity to the Santos harbor were all factors contributing to the attractiveness of this particular

state. Furthermore, in their agroecological zoning (ZAE CANA) in 2008, EMBRAPA attributed Mato Grosso do Sul with the highest potential for further sugarcane expansion due to the vast amount of suitable land which had been used as pastureland (Assunção et al. 2016, pp. 6–7; Domingues and Thomaz Júnior 2012, p. 147; Sant'Anna et al. 2016b, pp. 116–117; Sant'Anna et al. 2016a, p. 174).

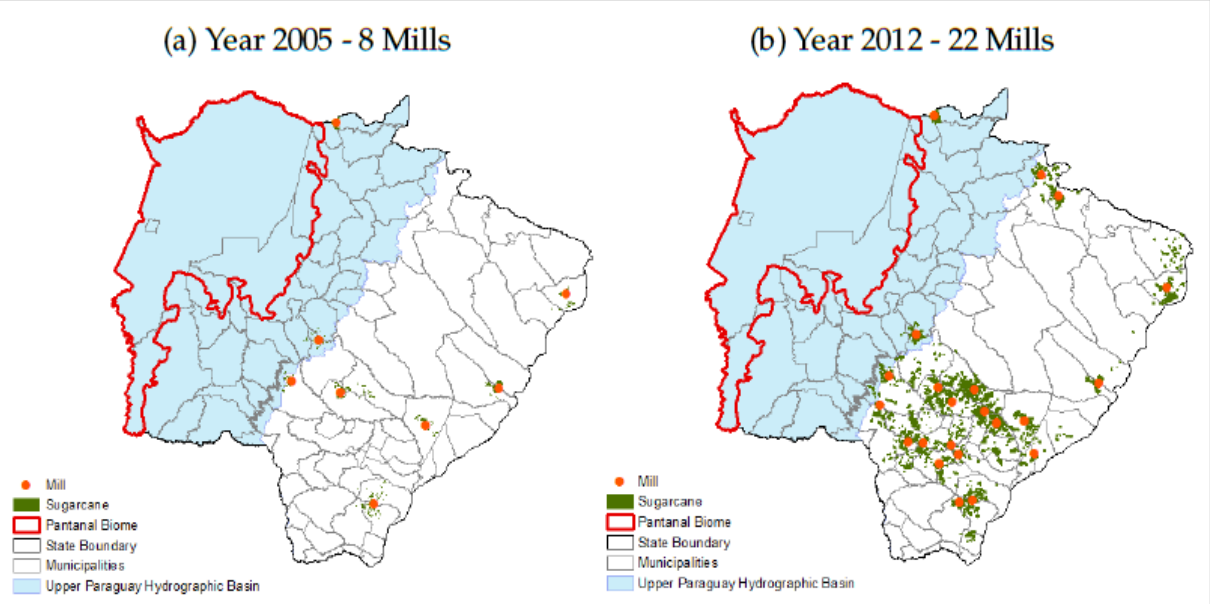
Figure 1: Number of newly established sugarcane industrial units in MS, 1979–2012



Source: Own graph based on Domingues 2017, p. 76

The expansion of the sector was particularly pronounced in the central south of the state, in the micro-regions of Dourados and in parts of Iguatemi (Figure 2).

Figure 2: Expansion of the sugarcane sector in Mato Grosso do Sul, 2005–2012



Source: Assunção et al. 2016, p. 31

The new expansion was funded by state credits (BNDES) and international investment and took two forms. First, investments in new greenfield production units, and second, the acquisition of already existing units. In 2010/11, when the global financial crisis hit Brazil, credit programs were cut and the unsustainably financed sugarcane sector partly collapsed. Production units were closed or bought by international investors, which completed the process of internationalization that was already in progress (Wilkinson 2015, p. 3). In spite of the crisis, the production of sugarcane, sugar and ethanol increased (Table 1)[6]. Since 2014/15, the sugarcane sector has been slowly recovering.

Table 1: Production and area of the sugarcane sector in Mato Grosso do Sul, 2000–2016

	Sugarcane area (ha)	Sugarcane (thousand tons)	Sugar (thousand tons)	Ethanol (thousand m^3)
2000	98,958	7,410	320	371
2001	99,673	6,521	232	315
2002	112,100	7,744	328	397
2003	120,534	8,247	374	418
2004	130,970	8,886	403	480
2005	136,803	9,475	406	521
2006	152,747	9,038	401	496
2007	191,577	11,635	576	641
2008	252,544	14,869	616	877
2009	285,993	18,090	657	1,076
2010	399,408	23,111	747	1,261
2011	495,821	33,520	1,329	1,849
2012	558,664	33,860	1,588	1,631
2013	642,686	37,330	1,742	1,917
2014	639,899	41,496	1,368	2,231
2015	692,300	44,684	1,391	2,507
2016	658,282	47,817	1,302	2,777

Source: UNICADATA, IBGE

[6] The expansion of the area largely continued, and has only recently started to decrease. A representative from the State Secretariat of the Environment, Economic Development, Production and Family Agriculture (SEMAGRO) explained that the official IBGE data underestimates the cultivation area (e.g. about 661,000 ha instead of 702,000 ha in 2017). The more reliable data from the new georeferencing system shows a reduction in area between 2017 and 2018 (Interview n° 01, 22/05/2018).

5.1 Old actors, new actors and changed actor alliances

The new expansion and investments changed a what was formerly a national sector into an international industry with powerful, financially strong actors (Wilkinson 2015). Today in Mato Grosso do Sul, the most important companies in terms of milling capacity are:

- Atvos: Odebrecht branch, Brazilian-based transnational capital
- Biosev: controlled by Louise Dreyfus, French-based transnational capital
- Adecoagro: Brazilian-Argentinean-based transnational capital
- Raízen: Shell-Cosan joint venture, British-Dutch-Brazilian-based transnational capital
- Bunge: US-based transnational capital

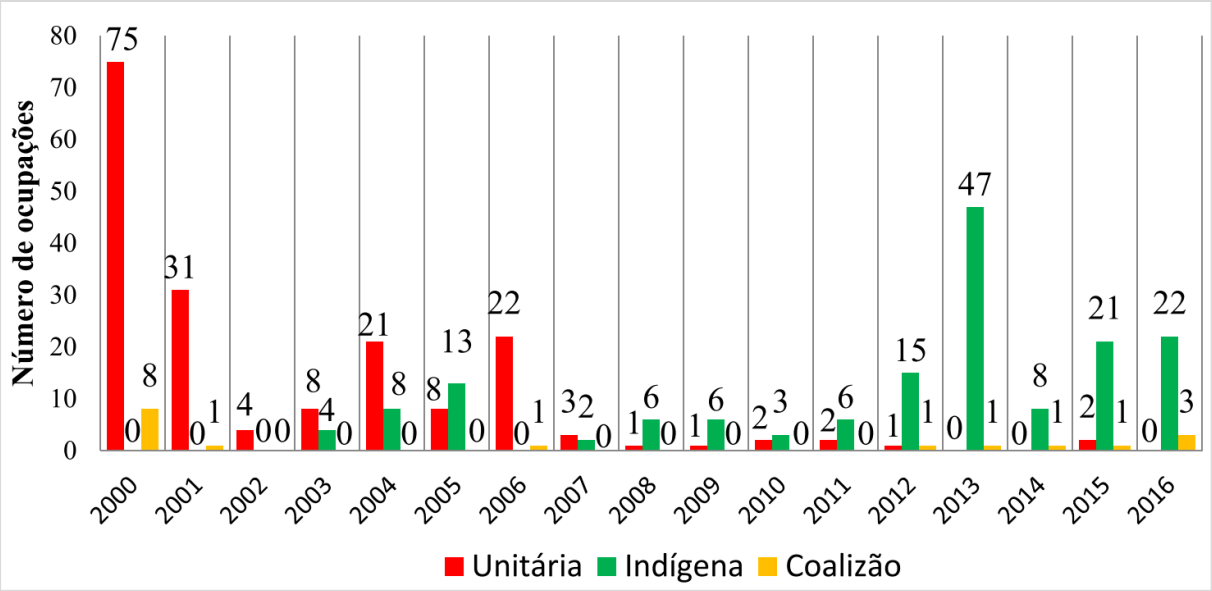
Furthermore, Nardoque et al. (2018, pp. 626–627) point to the close connection between industry and the state. Not only was the expansion financed via state credit programs (BNDES, PAC and *crédito rural*), but the sector also profited from tax reliefs as well as infrastructure and land donations[7] (Azevedo and Thomaz Júnior 2010, pp. 3–4; Domingues 2017, p. 97; Sauer and Leite 2011, p. 21). In Mato Grosso do Sul, several politicians cultivate sugarcane, including state representative Zé Teixeira, for example (Indriunas 2018). Of course, state actors are not a homogenous group. There are federal and local authorities, e.g. for (development and) family agriculture, which support peasant agriculture and the Indigenous people.

The relationship between the 'old' agricultural elite of cattle and soybean farmers and the new sugarcane industry is more difficult to assess. One representative of the union of big landowners, the *sindicato rural* (rural union), stated that the consequences of sugarcane expansion had had no negative impact on big landowners and that there was no competition for land[8]. This makes sense given that the sugarcane sector rarely buys land for sugarcane plantations, instead renting it from big landowners (Domingues 2017, 2010). The old elite profited from rising land prices and received returns from renting out parts of their land to the sugarcane sector. Nevertheless, when the São Fernando industrial unit became insolvent, some of the big landowners were never paid for their land and had to wait years to get it back[9].

[7] Interviews with representatives of two different Municipal Secretariats for Economic Development (Interview n° 02, 05/06/2018; Interview n° 03, 07/05/2018) and a representative of SEMAGRO (Interview n° 01, 22/05/2018).
[8] Interview with a representative of a Rural Union (Interview n° 04, 20/06/2018).
[9] Interviews with three big landowners (Interviews n° 05, 06, 07, 07/05/2018).

While the expansion fostered a strong alliance between the state, the sugarcane industry and (at least) parts of the agricultural elite, the elements of civil society that were affected suffered fragmentation. The fragmentation was not directly caused by the sugarcane industry expansion but occurred at roughly the same time. The agrarian reform movement is split into various landless movements and labor unions. The National Institute for Colonization and Agrarian Reform (INCRA) reported that the main movements engaged in the agrarian reform were the landless movement (MST), the rural workers union (FETAGRI), the union umbrella organisation (CUT) and the federation of family agriculture (FAF). Since 2010, 11 more movements[10] have appeared, and this only takes the movements registered with INCRA into account. INCRA regarded disagreements to be the main reason for the fragmentation. MST representatives stated that land occupations had become a business. In many land occupation camps (which are not part of MST), it is common for members to have to pay for the shacks and to attend meetings[11]. These practices have led to disappointment amongst landless people who are now harder to mobilize. Nardoque et al. (2018, pp. 629–640) describe how MST's activism was weakened after their ally, the Workers Party (PT) seized power in 2003. Figure 3 shows how the land occupations led by landless movement coalitions declined and the occupations by the Indigenous movement increased.

Figure 3: Number of land occupations, Mato Grosso do Sul, 2000–2016



Source: Nardoque et al. 2018, p. 639 based on Dataluta
Note: **Unitária** includes MST, MCLRA, NOVO, CUT, OLT, Ligas Camponesas e Urbanas do Brasil, FETAGRI and CTB; **Coalizão** includes FNL, MAF and MPL

[10] OLT, UGT, MAF, MASC, MCLLA, MLLT, Coalisão, Liga Camponesa, Lutas, Novo and STRs; Interview with the representatives of the Agrarian Reform Authority (INCRA) (Interview n° 08, 22/05/2018).
[11] Interview with members of the landless movement MST (Interview n° 09, 12/05/2019).

5.2 Global land grabbing dynamics

As stated in the analytical framework, changes in social inequalities do not occur in national isolation. In fact, the major investments in Mato Grosso do Sul starting in the early 2000s were not specific to this region or even Brazil. They should be analyzed through the lens of international land grabbing dynamics. There was a surge of land grabbing at around the same time due to increased global demand for food, bioenergy sources and raw materials (Borras et al. 2011, p. 15; Sauer and Leite 2011, p. 1). Land grabbing is "relatively significant large acquisitions [of land] either through purchase or lease", which leads to a shift of control over land (Borras et al. 2011, p. 11). While land grabs are sometimes specified as large-scale land purchases by foreign investors, I prefer to use the broader definition proposed by Borras et al. (2011, p. 11) who state that land grabs involve a "variety of investors: natural persons or corporate, private or public or private-public investment groups, domestic or foreign".

Global land grabbing occurred mainly in two sectors. First, the non-food sector including industrial forestry, large-scale conservation, carbon offset arrangements and mineral extraction. Second, in the food (feed/fuel) sector which includes livestock and flex crops. Flex crops are plants such as corn, rapeseed, soybeans and sugarcane which have multiple and therefore flexible uses as food, feed or fuel (Borras et al. 2011, pp. 6–18; Sauer and Leite 2011, p. 2).

In Brazil, large-scale land acquisitions are not new, but they have increased since 2002. Together with the soybean sector, the sugarcane sector was the most important industry for these land deals and for foreign direct investments (Borras et al. 2011, pp. 9–17; Sauer and Leite 2011, p. 1; Wilkinson et al. 2012, p. 426).

5.3 National policies reflecting a global green/sustainable development paradigm

The catalyst for the resurgence of the sugarcane sector in Brazil in the early 2000s was the introduction of the flex-fuel car, a vehicle that is designed to run on both gasoline and ethanol. Second, the government under the newly elected president, Luiz Ignácio Lula da Silvas, made the expansion of the sugarcane industry one of its key objectives and it was therefore supported by a wide range of public policies. A blending quota of 20–25 percent of ethanol to gasoline was established, a carbon tax (CIDE) was imposed on gasoline and the taxes on the purchase of flex-fuel cars were lowered. Furthermore, the government provided subsidized loans for the sugarcane industry through the development bank BNDES. Between 2003 and 2011, these subsidized loans amounted to approx. 28.2 billion Brazilian Reais (approx. 8 billion euro) (Brunner 2017, p. 5; Sant'Anna et al. 2016a, pp. 166–171; Wilkinson 2015, pp. 2–3).

But why, specifically at this time, were there these major efforts to foster bioethanol? The reason was the prospect of a global ethanol market, which would be driven by demands created through the Kyoto Protocol and COP21[12] (Embrapa Meio Ambiente 2014; Wilkinson 2015, pp. 2–3; Wilkinson et al. 2012, p. 430). In 2007, the Brazilian government published a study indicating the possibility that Brazil could meet five percent of the global demand for car fuel (Defante et al. 2018, p. 126).

Nevertheless, for Brazilian bioethanol to become a 'green' solution to the challenges of the transport sector in the context of the Kyoto and COP requirements, it would have to undergo some changes. The Brazilian government had to ensure that sugarcane production was sustainable. The Brazilian government therefore advanced zoning projects (ZEE and ZAE), which led to the exclusion of sensitive and biodiversity-rich areas from land investment. Furthermore, the government and the sugarcane industry agreed on a protocol (*Protocolo Agroambiental*) to abolish the burning of the sugarcane before harvesting. The burning facilitates the harvest, but releases large amounts of CO_2, which increases the carbon footprint of Brazilian ethanol. The solution was the gradual mechanization of the sugarcane harvest without prior burning (Embrapa Meio Ambiente 2014; Manzatto et al. 2009; Wilkinson 2015, pp. 2–3). This mechanization had important – ambivalent – effects on rural land and labor relations, which will be illustrated in Chapter 6.

6 Labor Regimes and Agrarian Change in the Expansion of the Sugarcane Industry

As described in Chapter 3, agrarian political economy looks at "the social relations and dynamics of production and reproduction, […] and their processes of change, both historical and contemporary." Social relations are expressed through labor regimes, which combine wage labor and subsistence production. This chapter starts with an introduction to group selection and property relations and the historical constitution of land and labor relations in Mato Grosso do Sul before moving on to a description of the two labor regimes: First, the ongoing semi-proletarianization of the peasants in agrarian reform settlements. Second, the double exclusion of the Guarani and Kaiowá Indigenous people. During my field work, I examined different rural groups and based on the results, I selected the groups that appeared to be most affected by changes resulting from the expansion and mechanization of the sugarcane industry. Access to land worsened for both groups. The agrarian reform peasants were integrated as wage laborers in the sugarcane industry. The Guarani and Kaiowá have been the main source of labor for the sugarcane sector since the 1980s, but this started to change around

[12] COP21 stands for the Paris Climate Conference of 2015, cf. UN. Available online at http://www.un.org/sustainabledevelopment/cop21/. Last accessed on 25/09/2017.

2012. These two groups therefore best exemplify how labor regimes change and wage labor and subsistence production are re-combined

In Brazil, roughly two types of peasants exist. First, small-scale agriculturists who own private property, and second, peasants who have obtained land via the agrarian reform process and occupy public land (Damasceno et al. 2017, p. 18). The agrarian reform process in Brazil is supposed to expropriate private land that is (no longer) 'productive' and therefore does not fulfil its social function (Fernandes et al. 2010, p. 799). I use the term unproductive land according to the INCRA definition: "The property (rural property) considered unproductive by INCRA is that which, although it is arable, is totally or partially unexplored by its occupant or owner"[13]. The expropriated land is directed towards agrarian reform settlement projects, in which the land is split up into smaller lots, which are then transferred to landless workers[14]. Land can also be integrated into the agrarian reform process through acquisition[15].

Indigenous land is — like the land in the agrarian reform settlements — public land. The Brazilian Constitution of 1988 recognizes the right of the Indigenous people to their traditionally occupied lands and obligates the government to demarcate these lands[16]. Unfortunately, by the time the government started to demarcate Indigenous land, competing interests were already present. This resulted in uncertainty and conflict over land due to overlapping property, a situation that persists to this day (Damasceno et al. 2017, pp. 17–18)**.**

[13] Author's translation, original quote: O imóvel (propriedade rural) considerado improdutivo pelo Incra é aquele que, embora seja agricultável, se encontra total ou parcialmente inexplorado pelo seu ocupante ou proprietário, INCRA: http://www.incra.gov.br/o-que-e-propriedade-improdutiva. Last accessed on 11/02/2019. INCRA uses dedicated indices to assess whether the land is unproductive or not: the exploration efficiency degree (Grau de Eficiência da Exploração, GEE) and the land use rate (Grau de Utilização da Terra, GUT), INCRA: http://www.incra.gov.br/imovel_improdutivo. Last accessed on 11/02/2019.

[14] INCRA, Obtenção de terras: http://www.incra.gov.br/Aquisicao_de_terras. Last accessed on 11/02/2019. INCRA, Assentamentos: http://www.incra.gov.br/assentamento. Last accessed on 11/02/2019.

[15] Interview with representatives of the Agrarian Reform Authority (INCRA) (Interview n° 08, 22/05/2018).

[16] "It is recognized that the indigenous peoples have the right to their social organization, customs, languages, beliefs and traditions, and their original rights over the lands that they have traditionally occupied, it being the duty of the federal government to demarcate these lands, protect them and ensure that all their properties and assets are respected", ISA: https://pib.socioambiental.org/en/Constitution. Last accessed on 06/05/2019.

Figure 4: Process for Indigenous land demarcation

Info box 2: Process for Indigenous land demarcation

(1) Studies of identification

The Indigenous department FUNAI appoints an anthropologist who will produce an anthropological study of identification of the Indigenous land. The anthropologist's study is complemented with the work of a specialized technical group, which will carry out additional studies of ethno-historical, sociological, juridical, cartographic and environmental natures, as well as a land survey.

(2) FUNAI approval

The report has to be approved by the president of the FUNAI, who publishes a summary in the DOU (*Diário Oficial da União* - the Federal Government's official publication) and in the *Diário Oficial* of the State where the future Indigenous land will be located. The publication must also be displayed in the local *prefeitura* (city hall).

(3) Disputes

From the beginning of the procedures up to 90 days after the publication of the report in the DOU, anyone may manifest demands of indemnification or indicate shortcoming in the report. The FUNAI has then to elaborate opinions over the arguments of all interested parties and hand over the process to the Ministry of Justice.

(4) Declarations of limits of the TI

The minister of Justice will have 30 days to: (a) emit a directive declaring the limits of the area and determining the beginning of its physical demarcation; or (b) prescribe judicial proceedings; or, (c) disapprove the identification, publishing a decision substantiated upon paragraph one of article 231 of the constitution.

(5) Physical demarcation

Once the limits of the area are declared, the FUNAI promotes its physical demarcation.

(6) Homologation

The demarcation procedure must be submitted to the President of the Republic for homologation by decree.

(7) Registration

The Indigenous land, demarcated and homologated, will be registered in the notary of the correspondent judicial district and in the office of patrimony of the union (SPU).

Source: ISA. https://pib.socioambiental.org/pt/Demarcações. Last accessed on 29/11/2018.

6.1 The historical dynamics of land and labor relations in Mato Grosso do Sul

This chapter traces the historical dynamics of land and labor relations to gain a better understanding of the circumstances under which the sugarcane industry expansion took place. Up until 1977, the region known today as Mato Grosso do Sul was still part of Mato Grosso. The formation of Mato Grosso do Sul only took place when the southern part of Mato Grosso became an independent federal state in 1977. Mato Grosso do Sul is located in the interior part of Brazil where the process of colonial settlement only started around 1718 when gold was found in the region (today Mato Grosso) (Missio and Vieira 2015, pp. 177–180).

In 1750, gold mining started to gradually decline and most gold prospectors abandoned the region. However, in around 1737, cattle farming started and became one of the most important economic activities, a role it continued to play for decades. Cattle raising was characterized by the occupation of large areas (Fabrini 2008, pp. 62–64; Missio and Vieira 2015, pp. 177–180; Pavão 2005, pp. 76–85), which was a starting point for an agricultural structure marked by high land concentration, small-scale agriculture and "ultra-extensive" livestock farming (Pavão 2005, p. 60).

Before the colonial settlements were established, Indigenous people occupied vast areas principally in the south of then Mato Grosso. The **Indigenous people** remained largely undisturbed by the first colonial explorations and settlements, which were in northern part of Mato Grosso where gold was extracted. There were encounters between settlers and Indigenous people when the border between the Portuguese and Spanish territories was redefined after the Treaty of Madrid (1750). The Indigenous people assisted the exploration of the conquerors and supported the transportation of troops and materials during the War of the Triple Alliance (1864–1870). Indigenous (cheap) labor was used in the construction of railroads, telegraphic lines, clearing of areas for livestock farming, harvesting of yerba mate and other activities (Rezende 2014, p. 192). This period marked the beginning of the exploitation of the Indigenous people as wage laborers. Employment conditions, especially in the extraction of yerba, were characterized by exhausting working hours and bonded labor which was more like more slave-like (as defined in the Brazilian Criminal Code) than wage labor (Mura 2006, p. 75; Pavão 2005, p. 98).

In 1889, Brazil became an independent Republic and the authority for land policies was transferred to the different federal states. The subsequent land distribution in Mato Grosso (do Sul) favored the large-scale land acquisition of **big landowners** over small-scale redistributive land donations to **landless people or small-scale settlers** (Fabrini 2008, pp. 60–61), which reinforced the already unequal access to land. Between 1915 and 1928, through the Service for the Protection of Indians (*Serviço de Proteção ao Índio,* SPI, today FUNAI), the state government started to clear the land for colonization projects and transferred the **Indigenous people** to reservations (Brand et al. 2008, pp. 37–47). In the 1970s, the territory of the Guarani and Kaiowá was reduced from

approximately 2,000,000 ha to 18,124 ha in eight reservations. The assigned areas were too small to allow the traditional subsistence production based on hunting, fishing, gathering and diversified agriculture (Brand et al. 2008, pp. 38–44). The restrictions imposed on the Indigenous people (together with missionary work) not only served to remove them from their lands, but also to foster their integration into a 'civilized' and 'organized' life as wage workers. Where Indigenous people served as a cheap source of labor, such as in the extraction of yerba mate, for instance, they were given permission by the 'landowners' to access the land. Where their labor force was not needed, farmers had them removed and taken to reservations by the SPI (Mura 2006, pp. 83–86). Thus, the joint forces of state and big landowners limited access of the Indigenous people to their land, limited their ability to continue with their traditional subsistence production and integrated them into wage labor.

In 1937, the March to the West program initiated another wave of settlements in Mato Grosso (do Sul). Dedicated initiatives for **smallholder** land settlements like the Dourados Agricultural Colony *(Colônia Agrícola Nacional de Dourados,* CAND*)* were implemented (Fabrini 2008, pp. 68–77). Where these initiatives targeted smallholder land settlements, the land concentration was lower than in places where large-scale private land acquisition predominated. However, the acquisition of huge areas continued to dominate the local dynamics of land appropriation (Fabrini 2008, pp. 68–77). The state constitution was altered to satisfy the interests of politics and economic groups from the south and southeast of Brazil: the limit for private land acquisition was raised from 500 ha to 10,000 ha for each individual. (Brand et al. 2008, p. 41; Fernandes 2012, p. 37). Once again, the dominant class fractions of state officials and big landowners together controlled the access to land to their own advantage.

Another group that migrated to Mato Grosso do Sul were **landless workers** hoping for wage work and land. In the earlier years, they lived on the large estates and cleared the land for cattle raising. The modernization of the agriculture sector under the Brazilian military government, starting in the 1960s, led to the expulsion of landless rural workers from the small farm lots they had not only worked but also lived on. The land where the workers had lived was now used for the expansion of soybean agriculture. By the 1970s and '80s, rural workers had not only lost their subsistence agriculture, but also permanent and seasonal jobs due to mechanization (Baer 2014, 285-286; 303; Fabrini 2008, pp. 70–71) and the first uprisings of the landless workers began. In 1985, the national landless workers' movement (MST) was founded (Almeida 2003, pp. 119–121). By 1984 the state government and the Agrarian Reform Authority (INCRA) had already established the first two agrarian reform settlements in Mato Grosso do Sul (Almeida 2003, p. 130). This historical description shows what Bernstein meant when he talked about categories being fluid. Wage laborers gained access to land and eventually became peasants.

Even though, over the years, the smallholder settlement programs and agrarian reform settlements led to an increase in the number of small-scale agrarian establishments,

their share of territory did not increase accordingly. According to Almeida (2003, p. 114), the historical dynamics of unequal land distribution has led to a dominant class of big landowners who direct the fate of Mato Grosso do Sul. The big estates remained predominant and with it the high land concentration (Fabrini 2008, pp. 60–61). Today, 42,675 rural estates on less than 100 ha occupy just 3 percent of the state's land, while 21,889 estates with more than 100 ha occupy 97 percent of the land (Table 2).

Table 2: Number of agrarian establishments by property size and share of territory, MS, 2006

Size of agrarian establishment	Number of agrarian establishments	Total area in ha	Share of area
Smaller than 100 ha	42,675	938,517	3%
Larger than 100 ha	21,889	29,336,459	97%

Source: Pavão 2005, p. 162 (based on IBGE, Censos Agropecuários and Anuário Estatístico do Brasil); Censos Agropecuários: sidra.ibge.gov.br

The late 1970s and early 1980s also saw the land of the Indigenous people, especially of the Guarani and Kaiowá, being reclaimed. The Indigenous movement of this time was supported by civil society and managed to reclaim 11 areas of a total of 22,450 ha. By the 1980s the demarcated Indigenous territory had doubled. However, the majority of Indigenous people continued to live in small areas on three reservations (19,638 people in 9,498 ha). Undernourishment, violent conflict and suicide were and are still common (Abascal et al. 2016; Brand et al. 2008, pp. 44–47). The Guarani and Kaiowá continue to reclaim various areas in Mato Grosso do Sul. Data from 2014 show that they occupy roughly one percent of the state territory of Mato Grosso do Sul (35,000 ha). A further 900,000 ha are in the process of being reclaimed by the Indigenous people (Boas 2016). According to data from 2016, 74 reclaimed lands have not yet even begun the demarcation process. Only nine are declared, three homologated, six identified and ten are to be identified (Table 3). Hence, so far, the Indigenous people have not yet been able to access their land to (fully) move back into subsistence production.

Table 3: Status of Indigenous land in Mato Gross do Sul, 2016

Status of Indigenous land	Number
To be identified	10
Declared	9
Homologated	3
Identified	6
No measures	74
TOTAL	102

Source: CIMI 2017, pp. 54–55

To secure their livelihoods even with limited access to land, the Indigenous people started to work in the sugarcane sector during the time of *Proálcool* (see Chapter 5). As before, they served as a cheap source of labor for the land clearings and the extraction of yerba mate. They did not have any formal employment contracts and the companies did not comply with basic labor rights such as rest days or the right to strike. The working conditions were often slave-like, as defined in the Brazilian Criminal Code, with inhumane conditions, excessive workloads and bonded labor (Pauletti 2014, pp. 53–59; Rezende 2014, pp. 195–198). After protests by social movements and national and international media coverage in the early 1990s, the Standing Committee to Investigate and Control the Working Conditions in Coal Stoves and Distilleries in Mato Grosso do Sul and a regional department of the Public Prosecution for Labor Rights (MPT) were founded. Penalty payments were and still are imposed on companies where slave-like and/or child labor are found (Pauletti 2014, pp. 39–42; Rezende 2014, pp. 198–199).

6.2 Agrarian reform peasant labor regime: temporary semi-proletarianization

This section focuses on how the labor regime of the peasants on the agrarian reform settlement in the central south of Mato Grosso do Sul changed with the expansion of the sugarcane industry. Peasants on agrarian reforms settlements are generally former landless wage laborers who obtained land by registering for the agrarian reform process at the Agrarian Reform Authority (INCRA).

The number of new agrarian reform settlements per year has been decreasing since 2005 and there has not been a new agrarian reform settlement established since 2013. Of course, this dynamic is not caused exclusively by the sugarcane expansion, but also by the nation-wide advancement of export-led agribusiness and the abandonment of the peasants and the agrarian reform plans by the government (Robles 2018). However, the sugarcane expansion is yet another reason for competing land claims and has played a particularly influential role in the rise of land prices. Between 2002 and 2013, the variation in land prices in Mato Grosso do Sul was 586 percent, which was one of the highest in Brazil[17] (Sant'Anna et al. 2016b, 314). The surge in land prices can mostly be attributed to the expansion of the sugarcane sector. During the major price hike, the international commodity price for soybeans, the main agricultural product in Mato Grosso do Sul, was low[18] and the planted area of soybeans diminished between 2006 and 2012 (Semagro, BDEWeb based on IBGE – Produção Agrícola Municipal).

[17] The prices rose from 2,689 R$/ha to 4,983 R$/ha for agricultural land and from 1,644 R$/ha to 3,220 R$/ha for pastureland between 2000 and 2005 (Gasques et al. 2008, pp. 9–10).

[18] Interviews with three big landowners (Interviews n° 05, 06, 07, 07/05/2018), and a representative of a Municipal Secretariat of Economic Development (Interview n° 03, 07/05/2018).

In general, as land prices increase, redistributive agrarian policies become less likely (Borras et al. 2011, p. 37; Sauer and Leite 2011, pp. 5–6). Looking at the federal state of São Paulo, Fernandes et al. (2010, p. 800) demonstrated that between 2003 and 2008, the area for sugarcane increased by 114 percent, while the area for agrarian reform settlements only increased by 10 percent. The same dynamic holds true for Mato Grosso do Sul. The statistical data show that between 2000 and 2016 the sugarcane area expanded by 565 percent, the agrarian reform settlements by 66 percent and the Indigenous land by just 5 percent (Table 4).

Table 4: Flex crops, agrarian reform settlements and the expansion of Indigenous land in Mato Grosso do Sul in 2000 and 2016

	2000		2016		2000–2016
	Hectares	% of agricultural land*	Hectares	% of agricultural land	Change in %
Soybeans	1,106,301	3.8%	2,448,330	8.4%	121%
Sugarcane	98,958	0.3%	658,282	2.3%	565%
Agrarian reform settlement	432,550	1.4%	716,212	2.5%	66%
Indigenous land	597,050	2.0%	626,371**	2.1%	5%

Source: Soybeans – Semagro BDEWEB; Sugarcane – UNICADATA; Agrarian reform settlements – own calculations based on INCRA MS; Indigenous land – own calculations based on terrasindigenas.org.

Note: *the agricultural land of Mato Grosso do Sul amounts to 29,200,000 ha: https://censoagro2017.ibge.gov.br/templates/censo_agro/resultadosagro/pdf/MS.pdf; Last accessed on 29/11/2018. **the suspended area Limão Verde was discounted from the 2016 Indigenous land.

It is important to emphasize that the sugarcane expansion in Mato Grosso do Sul did not mean the mass displacement of small-scale agriculture. This corresponds with Borras et al. (2011, pp. 6–33) who compared the land grabs in Latin America to other regions. Rather than displacing peasants in great numbers, the land grabs in Latin America targets sparsely populated regions. Indigenous communities are therefore more significantly affected (see Chapter 6.3). Rather than being displaced, peasants are incorporated into the emerging commercial plantation system (see below). Although peasants were not excluded from their land, the already restricted access to land for landless people was exacerbated. The expansion of the sugarcane industry has bolstered the dominant classes, in the form of a big landowner-state-industry alliance (see Chapter 5.1), which limited access to land, increased the barriers to entering the peasant labor regime and therefore made subsistence production more difficult.

The second impact the sugarcane industry had was to create employment opportunities[19]. Other rural industries in Mato Grosso do Sul such as cattle raising and soybean production demand lower levels of labor force[20], and thus the expansion of the sugarcane sector provided new job opportunities (Figure 5). In 2016, the sugarcane sector in Mato Grosso do Sul employed 25,577 people in the industrial and agricultural parts of the sector, a figure that corresponded to 1 percent of all people of employable age (2,448,001 persons in 2014, SEMADE 2016). Furthermore, changes also occurred due to the mechanization of the harvesting and planting of sugarcane. By 2012 most of the sugarcane harvest and planting in Mato Grosso do Sul was mechanized[21]. In comparison to São Paulo, the mechanization did not lead to a drop in the number of employees in the sugarcane sector[22]. This can be explained by the expansion of the sugarcane area and increased number of production units in Mato Grosso do Sul. Even with the mechanization, the overall effect was an increase in the number of employees, which only slowed down in 2012 due to the crisis in the sector.

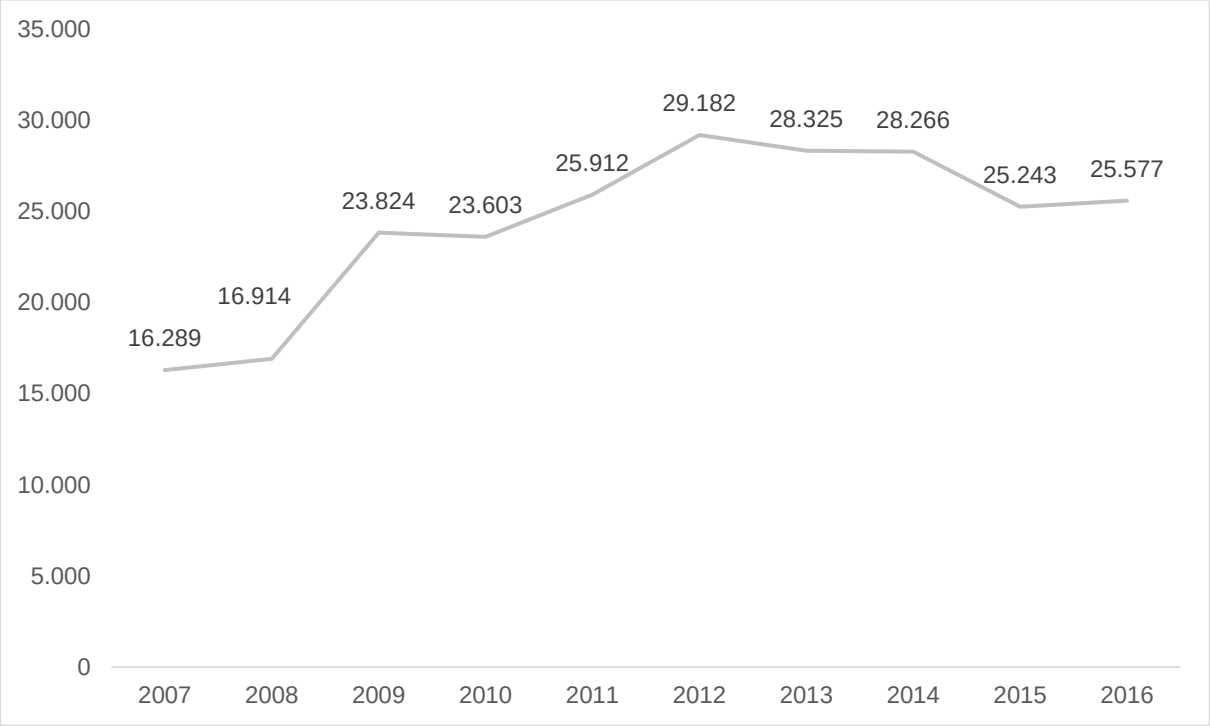
[19] Of course, different groups had different views on this employment creation. The representatives of the State Secretariat of the Environment, Economic Development, Production and Family Agriculture (SEMAGRO), the Rural Union, the Association of Sugarcane Producers Biosul and the State Agricultural Research Authority Embrapa saw the job creation and local development as the main positive impact of the sugarcane expansion (Interviews n° 01, 07, 10, 08). Representatives of more environmentally focused institutions also reported that the sugarcane industry created new job opportunities, but at the same time pointed out that this came with (socio-)ecological disadvantages (two Municipal Secretariats for Economic Development, Interview n° 11, 04/05/2018 and Interview n° 12, 20/06/2018; person from an organic agriculture association, Interview n° 13, 03/05/2018).

[20] Interview with a big landowner who cultivates soybeans (Interview n° 14, 23/11/2917), with a university professor (Interview n° 15, 20/11/2017), and with a person from an organic agriculture association (Interview n° 13, 04/05/2018).

[21] Interview with the MPT (Interview n° 16, 13/06/2018).

[22] According to data from RAIS (*Relação Anual de Informações Sociais*, Annual Overview of Social Information) organized by DIESSE (*Departamento Intersindical de Estatística e Estudos Socioeconômicos*, Inter-Union Department of Statistics and Socio-Economic Studies).

Figure 5: Employees in the sugarcane sector in Mato Grosso do Sul, 2007–2016



Source: RAIS, organized by DIESSE

Peasants, especially from the agrarian reform settlements, started to work in the sugarcane industry. Landless workers who receive land through the agrarian reform process can theoretically access credits and technical assistance from the state to help with house construction and initial agricultural activities. However, credits are often paid late or not at all, technical assistance is unavailable or inadequate and the lack of infrastructure for the commercialization of peasant products hampers the generation of income. Furthermore, the weather can cause the loss of a whole season's harvest and therefore loss of income. These are just some of the issues that drive (new) peasants into debt. Indebted peasants no longer have access to credits from the peasant credit programs[23].

However, the sugarcane industry provided a way for peasants to resist on the land: the transformation of the peasant labor regime into a regime of (temporary) semi-proletarianization. Indebted peasants with no access to new credits had an alternative to leaving the land. The income they received from their wage labor allowed them to pay their debts and finance necessary investments. This model existed before the sugarcane expansion. Peasants supplementing their work on their own land with (seasonal) work on large estates or other activities is a common practice. Nevertheless, the ex-

[23] Interviews with peasants on an agrarian reform settlement (Interviews n° 17, 18, 19, 16/06/2018), a member of the MST (Interview n° 20, 22/11/2017), a representative of Agraer (Interview n° 21, 10/11/2017), a representative of a rural labor union (Interview n° 22, 16/11/2017).

pansion of the sugarcane sector allowed for a larger mass of people to become temporary wage workers. The descriptions of different peasants were similar. They worked in the sugarcane sector for a period of time until they had saved enough money to (re)start their lives as peasants. Peasants from different agrarian reform settlements reported that, for them, temporary wage work is a way of resisting on the land[24]. While the new employment opportunities in the sugarcane sector allowed for more peasants to be semi-proletarianized, this process was not permanent. As soon as peasants had achieved a more stable income in their agricultural activities, they went back to being just peasants. Peasants were therefore only able to secure their access to land and move back into subsistence production by temporarily entering into wage labor. The agrarian reform peasant labor regime is therefore a combination of wage work and subsistence production.

6.3 Labor regime of the Indigenous Guarani and Kaiowá: double exclusion

This section focuses on how the labor regime of the Guarani and Kaiowá Indigenous people changed in parallel with the sugarcane industry expansion and mechanization. The Guarani and Kaiowá in the central south of Mato Grosso do Sul mainly live in Indigenous reservations, on small Indigenous land or on land which is in the process of being reclaimed. Some communities practice small-scale agriculture, hunting and fishing. In most cases this is insufficient to secure their livelihoods (see Abascal et al. 2016).

As described in Chapter 6.2 one of the impacts of the sugarcane industry expansion in Mato Grosso do Sul was the land price surge. This had a pronounced effect on Indigenous land demarcation. When an area is approved as Indigenous land, the previous land title becomes invalid. This means that the landowners do not receive any compensation for the land they lose. They receive the compensation for the *benfeitorias*, the cost of acquisition, creation or improvement of an asset such as a house or stable. When the land prices were low, the costs of the *benfeitorias* exceeded the prices of the land. With the increased land prices, it became unprofitable for the landowners to receive only the costs of the *benfeitorias,* which now amounts to just a fraction of the land value[25].

Big landowners who usually plant soybean or sugarcane or raise cattle resist the demarcation process via juridical measures. As soon as the demarcation process starts,

[24] Interviews with peasants on an agrarian reform settlement (Interviews n° 17, 18, 19, 16/06/2018), and a group discussion with peasants from different agrarian reform settlements (Interview n° 23, 20/04/2018).
[25] Interview with a big landowner who has land that partly lies on identified Indigenous land (Interview n° 14, 23/11/2917), and with the Public Prosecution (Interview n° 24, 11/06/2018).

they file an objection[26]. Landowners even achieved the annulment of Indigenous land that had already been declared. *Terras Indígenas* reports on their website that in 2015, 140 legal actions concerning Indigenous land demarcation in Mato Grosso do Sul had been taken to the federal courts (Caliari 2016; Miotto 2018). The federal government demarcated the last Indigenous land in 2004[27]. The increase in power of the dominant class alliance becomes even more apparent in the case of the Guarani and Kaiowá. While in the case of the landless people/peasants, 'only' the creation of new agrarian reform settlements were complicated, in the case of the Guarani and Kaiowá, even already existing demarcated Indigenous lands were taken back. Thus, the unequal access to land was not only consolidated but exacerbated.

The agrarian reform peasants managed to make a living by temporarily working in the sugarcane industry. The Guarani and Kaiowá, on the other hand, had been the main labor force in the sugarcane sector since it first emerged in the time of *Proálcool* (see Chapter 5). Due to the ongoing mechanization working conditions started to improve. First, the biggest problems in terms of inhumane working conditions had been inadequate board and lodging for the hundreds of temporary – mostly Indigenous – laborers. Recruitment and hiring policies changed with mechanization. Instead of hiring hundreds of temporary laborers who were brought to the sugarcane plantations for just a couple of months or weeks, they permanently employed a smaller number of people who lived near the company site to work as truck drivers and machine operators. This made board and lodging unnecessary. Second, the companies started to employ higher qualified personnel and were therefore willing to offer formal contracts, higher payment and better benefits[28]. The regional department of the Public Prosecution for Labor Rights (MPT) reported that the problems with (Indigenous) slave-like labor in the sugarcane sector have dramatically improved[29].

Nevertheless, as mechanization continued there was a drop in the number of employees after 2012 (Figure 5 in Chapter 6.2). This was largely due to the financial and economic crisis, however. Figure 6 also highlights another reason for the decline in the number of employees in the sector. The figure shows the difference in the number of employees in the agricultural part (sugarcane cultivation and harvest) and the industry part (fabrication of sugar and ethanol) of the sector. While the number of employees in the industrial part increased until 2014 and then only declined slightly, the number in the agricultural part declined steadily. The Indigenous people who had worked mainly in the agricultural part were laid off or not hired any more.

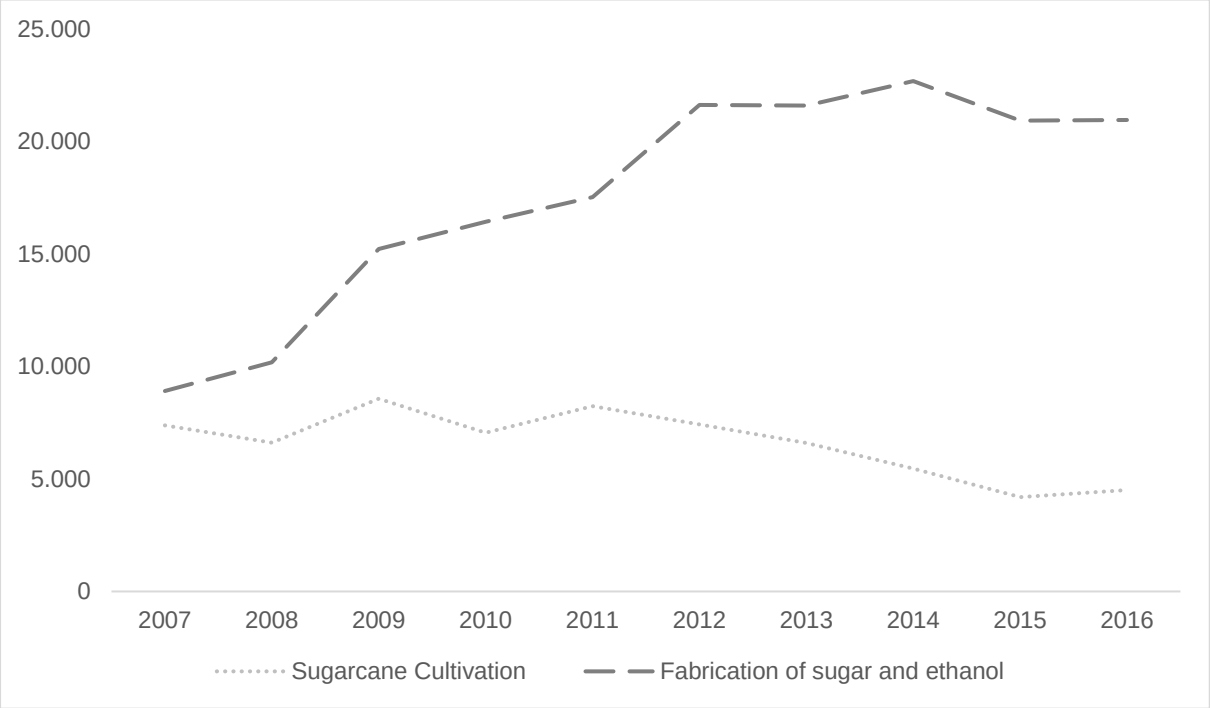
[26] Federal prosecutor at an assembly of the Guarani and Kaiowá (participatory observation n° A, 18/04/2018).

[27] Terras Indígenas: https://terrasindigenas.org.br/pt-br#pesquisa. Last accessed on 25/09/2018.

[28] These benefits and better payment have been under attack since the 2017 labor reform and thus working conditions have deteriorated again since then (Interview with a representative of a labor union, Interview n° 25, 09/05/2018).

[29] Interview with the MPT (Interview n° 16, 13/06/2018).

Figure 6: Number of employees in the sugarcane sector by area, Mato Grosso do Sul, 2007–2016



Source: RAIS, organized by DIESSE

Indigenous people reported that they were never given the reasons why they were not hired again. One reason might be that their education level was mostly low and training to become a tractor or truck driver or even a machine operator requires literacy in Portuguese and sometimes English. Some Indigenous people suspected that after years of the public prosecution enforcing the law to achieve better working conditions for Indigenous people, the companies were no longer willing to hire Indigenous persons[30]. Certainly, there is deeply rooted discrimination against Indigenous people and one of the most common prejudices is that they are lazy[31].

For the Guarani and Kaiowá Indigenous people, the new labor regime is characterized by a double exclusion. Chapter 6.1 showed that the Indigenous people had been excluded from their lands and their traditional subsistence production for decades. In the sphere of wage labor, the Guarani and Kaiowá were not only unable to profit from the improvements in working conditions, but also lost their position as a cheap source of labor. The jobs in the sugarcane industry had been one of the few possibilities they had for survival. Malnutrition, high infant mortality and suicide rates (Abascal et al. 2016, pp. 1–2) show that securing livelihoods became very difficult.

[30] Interviews with Indigenous people in a reservation (Interviews no° 26, 27, 18/06/2018) and on Indigenous land (Interview n° 28, 19/06/2018).
[31] This was mentioned various times during the interviews that I was not allowed to record, or in informal conversations.

7 Conclusions

The main objective of this paper was to improve our understanding of how the expanding production of sugarcane-based bioethanol affects existing social inequalities in land and labor relations as part of an emerging bioeconomy. In the paper, I applied a case study approach with field research in the central south of the Brazilian federal state of Mato Grosso do Sul. The analytical framework, based on social inequalities perspective and the agrarian political economy, guided the data analysis.

Firstly, I demonstrated the important influence of the interrelationship between global dynamics and national policies on the local level. The global dynamics of land grabbing and a green development discourse in the context of the Kyoto Protocol and COP21 fostered the resurgence of the Brazilian sugarcane sector. The global green development discourse had an important impact on the mechanization of the sugarcane harvest with a view to reducing CO_2 emissions. Mechanization, in turn, had a profound impact on local labor relations. The green grabbing dynamics and the increasingly strong sugarcane sector led to an expansion of the sugarcane industry with a subsequent surge in land prices. The increase in land prices impaired the access of Indigenous people to land and made subsequent agrarian reform processes more difficult. This shows that social inequalities do not change in national, regional or local isolation. Instead, social inequalities are the result of interrelationships between already existing, historically rooted inequalities at the local level, which, in turn, are altered through complex interconnections with regional, national and international dynamics such as the Brazilian government's promotion of bioethanol in the context of global land grabbing and the sustainable development paradigm.

Secondly, I displayed how changes in the economic structure of a region transform land and labor relations as well as the interrelationship between them, while, at the same time, revealing how these changes effect different groups in uneven ways. Big landowners, the state and the sugarcane industry formed a new alliance and profited the most from the expansion of the sugarcane industry. The agrarian reform peasants and the Indigenous people suffered ambivalent and negative impacts of the expansion, which changed prior labor regimes. To a certain extent, peasants on the agrarian reform settlements benefitted from the (temporary) wage labor in the sugarcane industry, but, at the same time, the industry hindered the progress of the agrarian reform due to high land prices. The combination of agricultural subsistence production and the (temporary) integration as wage laborers in the sugarcane industry created a labor regime best described as **temporary semi-proletarianization**. As the name indicates, this is not a labor regime that peasants permanently remain part of. This example is an effective illustration of what Bernstein (2010, pp. 33–34) described as fluid categories ("landless labour", "small peasants") and of people moving between those categories or occupying them at the same time. Peasants would move in and out of this labor regime, which meant that a process of re-peasantization then repeatedly occurred.

The Guarani and Kaiowá Indigenous people largely lost their access to wage work in the sugarcane sector, which was one of the few ways they had to make a living given that they had been excluded from their original lands and traditional subsistence production for decades. The access to land for the Indigenous people became increasingly difficult due to the steep rise in land prices and contested land demarcation processes. Their labor regime is therefore best described as **double exclusion**, marked by decreased access to land and exclusion from wage labor.

These conclusions must be borne in mind when discussing the potential effects of the emerging bioeconomy. Even though the transition away from fossil fuels towards renewable energies is important, the impact on land and labor relations have to be considered and mitigated, as exemplified by the case of the Brazilian biofuel sector. This is especially relevant when the implementation of the bioeconomy includes the expansion of land-based biomass. Expansion dynamics do not necessarily always lead to peasants being evicted from their lands, but can hinder more equal land distribution policies and may even destroy the livelihoods of Indigenous populations. Although such expansion dynamics may have positive employment effects, a closer look reveals that with increased mechanization and technologization, the most vulnerable people (e.g. unskilled laborers) will not be able to profit from them. When reflecting on bioeconomy policies, effort must be made to consider how to avoid reproducing existing social inequalities and negatively impacting the most vulnerable population groups, such as unskilled workers and the peasant and Indigenous populations.

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List of Interviews and Participatory Observation

To assure anonymity names, gender, positions and detailed locations are omitted; in some cases the organization is also withheld.

N°	Sector	Organization	Location	Date
01	State	State Secretariat of the Environment, Economic Development, Production and Family Agriculture (SEMAGRO)	Mato Grosso do Sul	22/05/2018
02	State	Representative of a Municipal Secretariat for Economic Development	Mato Grosso do Sul	05/06/2018
03	State	Representative of a Municipal Secretariat for Economic Development	Mato Grosso do Sul	07/05/2018
04	Privat sector/union	Representative of a Rural Union	Mato Grosso do Sul	20/06/2018
05	Privat sector	Big landowner	Mato Grosso do Sul	07/05/2018
06	Privat sector	Big landowner	Mato Grosso do Sul	07/05/2018
07	Privat sector/union	Representative of a rural union and big landowner	Mato Grosso do Sul	07/05/2018
08	State	Representatives of the Agrarian Reform Authority (INCRA)	Mato Grosso do Sul	22/05/2018
09	Civil society	Members of the landless movement MST	Mato Grosso do Sul	12/05/2019
10	Private sector	Association of Sugarcane Producers Biosul	Mato Grosso do Sul	14/03/2017, 29/05/2018, 06/06/2018
11	State	Municipal Secretariat for Economic Development	Mato Grosso do Sul	04/05/2018
12	State	Municipal Secretariat for Economic Development	Mato Grosso do Sul	20/06/2018
13	Civil society	Person from an organic agriculture association	Mato Grosso do Sul	03/05/2018
14	Private sector	Big landowner	Mato Grosso do Sul	23/11/2917
15	Civil society	Professor	Mato Grosso do Sul	20/11/2017
16	State	Public Prosecution for Labor Rights (MPT)	Mato Grosso do Sul	13/06/2018
17	Family agriculture	Peasant on an agrarian reform settlement	Mato Grosso do Sul	16/06/2018
18	Family agriculture	Peasant on an agrarian reform settlement	Mato Grosso do Sul	16/06/2018
19	Family agriculture	Peasant on an agrarian reform settlement	Mato Grosso do Sul	16/06/2018
20	Civil society	Member of the MST	Mato Grosso do Sul	22/11/2017

21	State	Representative of Agraer	Mato Grosso do Sul	10/11/2017
22	Labor union	Representative of a rural labor union	Mato Grosso do Sul	16/11/2017
23	Family agriculture	Group discussion with peasants from different agrarian reform settlements	Mato Grosso do Sul	20/04/2018
24	State	Public Prosecution	Mato Grosso do Sul	11/06/2018
25	Labor union	Representative of a labor union	Mato Grosso do Sul	09/05/2018
26	Indigenous people	Indigenous person in a reservation	Mato Grosso do Sul	18/06/2018
27	Indigenous people	Indigenous person in a reservation	Mato Grosso do Sul	18/06/2018
28	Indigenous people	Indigenous person on Indigenous land	Mato Grosso do Sul	19/06/2018
Participatory observation				
A		Federal prosecutor from the assembly of the Guarani and Kaiowá	Dourados	18/04/2018