



# The whole Pantanal, not just the half.

Soy, waterway and other threats  
to the integrity of the Pantanal.

Sergio Schlesinger

The Ecosystem Alliance



**Wetlands**  
INTERNATIONAL

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1<sup>ST</sup> EDITION

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# Introduction

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The Pantanal is part of the so-called Paraguay-Paraná Humid Zone System, a complex that covers, in addition to Brazil, Argentina, Bolivia, Paraguay and Uruguay. Humid zones provide essential ecological services for fauna, flora and the well-being of human populations. They also play a vital role in mitigating climate change, since they are large carbon reserves.

Watered by the Paraguay and Paraná River basins, this system of wetlands is located in the center of South America, a region of high ecological value. It is a special environmental asset due to its complexity and uniqueness. It fulfills essential functions, like regulating river systems, mitigating large floods and droughts, recharging large aquifers, and maintaining natural fish breeding areas, in addition to providing and purifying large amounts of fresh water. Conservation and sustainable management of these natural resources are essential for maintenance of ecological cycles and biodiversity, disaster prevention and preservation of ecosystems and their communities (Nicola et al., 2006).

The Brazilian Pantanal is located in the states of Mato Grosso and Mato Grosso do Sul. It extends into Bolivia and Paraguay, where it is called the Chaco. Traditional communities, such as riverside, indigenous, maroon and bait collector communities, live there. Like these traditional human populations, plants and animals are adapted to its conditions.

Just as the environmental benefits the Pantanal provides go beyond its geographical borders, its survival depends on conservation of an area larger than that occupied by the biome, restricted to the Pantanal plain. A floodplain depends on its forming rivers. Consequently, it is impossible to think about conservation without considering the Upper Paraguay Basin (UPB) as a whole. The Paraguay River and the other formers of the Pantanal plain are born in the plateau area of the states of Mato Grosso and Mato Grosso do Sul. They are responsible for recharging the waters that flood the Pantanal.

The greatest threats to the Pantanal today are in these plateau areas. Among them, monoculture, ranching, mining, hydroelectric power plants and steel mills stand out. Deforestation of headwater areas, silting of the rivers, pollution and modification of the natural flow of the waters and a sharp reduction in the number of fish are the main consequences.

Of these threats, growth in the area of soybeans planted in non-flooding parts of the Upper Paraguay Basin stands out. Currently, close to 10% of the total area in all Brazil planted with soybean is found in this region. Unlike what occurs with sugarcane, whose territorial growth is prohibited in the Amazon, in the Pantanal and the Upper Paraguay Basin there is no legal mechanism for containing soybean expansion in the UPB.

Associated with soybean expansion, not only in the UPB but also in its surroundings, is another major threat: the project to extend the Paraguay-Paraná waterway to the city of Cáceres, in Mato Grosso, where soybeans would be the main product to be shipped. At the same time, with the presence of the waterway, a new push to expand soybean cultivation in the entire surroundings can be expected.

Brazilian legislation does not offer the region the protection necessary for its conservation. On the contrary, different mechanisms of the new Forestry Code, such as reduction of permanent preservation areas (PPAs) along riverbanks, expose the region even more to uncontrolled growth of predatory activities. The same occurs in relation to bills and other provisions, such as the Socioeconomic and Ecological Zoning for the State of Mato Grosso, which is currently blocked in the state's legislature, and that of Mato Grosso do Sul, as well as the water resources plans of the two states. To this can be added deficient oversight and limited resources for creation and maintenance of conservation units.

In the same way, no initiatives or actions on the part of the business community or governments, whether at the federal, state or municipal level, should be expected. The planned infrastructure works, expansion of mining and agribusiness, hydroelectric power use and use by other sectors of the natural resources in an intensive manner are part of the current development model. And this model charges a high price to local populations. They already have to overcome major difficulties to continue living by farming and fishing. The disposal of pesticides used in monoculture and grazing areas causes damages not only to family food production, but also the health of rural populations. In the same way, the inhabitants of large urban centers

who depend on these waters also are threatened by supply shortages and health problems as a function of the reduced volume and contamination of the waters.

For all these reasons, it is urgent that civil society be mobilized to conserve the Pantanal and its people. Diverse social movement institutions and NGOs in the region have been organizing around the Movement to Defend the Entire Pantanal. It is important for organizations at the national and international level to also support this movement, which is designed to deter the accelerated process degrading the Pantanal and the entire Upper Paraguay Basin.

With the objective of supplying new elements for mobilization, this work focuses on the expansion of soybeans in two regions of the Upper Paraguay Basin located in the state of Mato Grosso:

- The neighboring municipalities of Diamantino and Alto Paraguai, located in the headwater areas of the Paraguay River, where soybean cultivation has already been established for several decades;
- The neighboring municipalities of Cáceres and Poconé, whose territories are located in areas partially flooded by the Pantanal, where soybean cultivation has recently been growing.

In addition to soybeans, we briefly address other activities, such as implementation of the Paraguay-Paraná waterway, construction of new hydroelectric power plants, mining, extension of sugarcane cultivation and others that are the main threats to conservation of the UPB and the Pantanal.

Our field work in these municipalities, as well as our meetings held throughout the project, were organized and supported by FASE Mato Grosso, in the person of Vilmon Ferreira Alves. They also counted on the collaboration of members of municipal governments and representatives of small producer associations and agrarian reform settlements. We highlight and are thankful for the special support of Antonio Augusto Martins, an employee of the Instituto Centro de Vida (ICV) in Diamantino. The testimonies presented in highlighted color were collected over the course of this work.



# The Pantanal

Located within the Upper Paraguay Basin, the Pantanal occupies an area of approximately 200 thousand km<sup>2</sup>, of which 70% is in Brazil, 20% in Bolivia and 10% in Paraguay. The Paraguay River, which, together with its tributaries, is responsible for recharging the waters of the Pantanal, is born in Brazilian territory and its hydrographic region covers an area of 1,095,000 km<sup>2</sup>. The basin occupies an area of approximately 600,000 km<sup>2</sup> in South America, of which 363,442 km<sup>2</sup> is in Brazilian territory. The Brazilian Pantanal extends close to 150,000 km<sup>2</sup>, representing 40% of the area of the UPB. The region of its rivers' headwaters occupies an area of 215,813 km<sup>2</sup> in the plateaus located in its surroundings (Harris et al., 2006).

## The Hydrographic Region of Paraguay



Source: ANA

The fauna and flora of the Brazilian Pantanal are extremely dependent on the adjacent regions, mainly the Cerrado, located along the northern, eastern and southern edges of the Pantanal plateau. The rural populations of the Pantanal are strongly influenced by the hydrological oscillations that occur annually in the region. The water cycle, the water dynamics of the region, represented mainly by alternating periods of drought and flood, is the conditioning environment that maintains the ecological functioning of the entire region, ensuring high biodiversity. The surrounding areas of the Pantanal plateau, where the headwaters of the rivers that constitute the Pantanal are found, are refuges for fauna in unfavorable periods, sheltering species that move there to avoid floods and climatic extremes.

During floods, rivers, ponds and streams are interconnected by canals and lagoons or “disappear” into the “sea” of waters, allowing movement of aquatic species, seeds, eggs and larvae. The process of flooding large extensions is one of the main ones responsible for the constant renewal of life and for supplying nutrients. At the beginning of the dry season, isolated ponds and small canals form, which hold large numbers of fish and aquatic plants. These bodies of water slowly dry, attracting birds and other animals in search of food and promoting large concentrations of fauna. The Pantanal is also one of the most important areas for waterfowl and other migratory species, offering shelter, food and nesting grounds (ISA, 2007). All this dynamic, resulting from the cyclic movement of water, makes it one of the richest biomes in Brazil, but also one of the most fragile. A large variety of animal species live there: 263 species of fish, 113 of reptiles, 41 of amphibians, 463 of birds (such as the Jabiru, the bird-symbol of the Pantanal), 1,032 of butterflies and 132 of mammals.<sup>1</sup>

Due to its importance, the Pantanal was declared National Heritage by the 1988 Brazilian Constitution, and it also contains sites considered to be of significant international importance by the Convention on Wetlands of International Importance (Ramsar Convention). It also includes areas recognized as biosphere reserves by UNESCO, which also classifies the biome as Natural Heritage of Humanity.

Despite all this formal recognition, legal provisions designed to preserve the Pantanal are practically inexistent. Only 2.9% of the UPB and 4.5% of the Pantanal plain are protected today by conservation units and private natural heritage reserves. In truth, the only legal instrument in effect designed to provide special protection to the UPB in its entirety is the federal decree that, in 2009, established the Sugarcane Agroecological Zoning. The decree is today threatened by bills that would allow expansion of planting in the region.

It is within this panorama that the process of occupying the UPB is accelerating. The region, which until the beginning of the 1970s had undergone some economic cycles, such as mining and rubber, in addition to having significant herds of cattle, is now receiving large waves of migrants, coming mainly from the South and Southeast regions of Brazil. On lands where, until then, the presence of small farms, Indians, maroon communities and other Pantanal peoples predominated, new economic activities are being developed with the arrival of monoculture and expansion of cattle herds into areas of the Cerrado. In addition to agriculture and livestock, infrastructure works will strongly impact this territory.

In the plain region, periodic flooding impedes various human activities. The waters thus work to protect the biome, even if only partially. Consequently, the plant life on the plain is still mostly preserved. Monitoring undertaken between 2002 and 2012 shows that 14.3% of its surface had been destroyed by human activity (WWF, 2014).

## Causes of UPB Deforestation on the Plain – by 2012

Type of use	Area (km <sup>2</sup> )	% of the total plain
Grazing	17,798	11.78
Human modification	3,380	2.24
Farming	160	0.11
Reforestation	125	0.08
Urban influence	116	0.08
Degradation from mining	30	0.02
<b>Total</b>	<b>21,611</b>	<b>14.3</b>

Source: WWF, 2014.

<sup>1</sup> <http://www.mma.gov.br/biomas/pantanal/fauna-e-flora>

In the area of the UPB plateau, however, deforestation of areas vital for conservation of the Pantanal has been occurring at an accelerated pace in recent decades. On it, destruction had already affected 60% of the territory by 2012, as the same study shows. And farming has been accounting for an increasing portion of the deforestation: by 2008, it accounted for 4.2% of total deforestation. In 2012, this percentage had already hit approximately 11%.

### UPB Deforestation on the Plateau – by 2012

Type of use	Area (km <sup>2</sup> )	% of the total plateau
Grazing	95,852	44.06
Human change	23,863	4.17
Farming	9,080	10.97
Reforestation	887	0.41
Urban influence	722	0.33
Degradation from mining	35	0,02
<b>Total</b>	<b>130,439</b>	<b>60</b>

Source: WWF, 2014.



# Main Threats to the Integrity of the Pantanal

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We briefly describe below the activities that account for most of the social and environmental impacts on the UPB, threatening the integrity of the Pantanal.

## Cattle

Mato Grosso is the Brazilian state with the largest herd of cattle in Brazil, and Mato Grosso do Sul has the fourth largest. As can be seen on the table below, the pace of growth of the herd between 1992 and 2012 in Mato Grosso (183%) was much higher than the average for the country (37%). The same occurred in the four municipalities studied here.

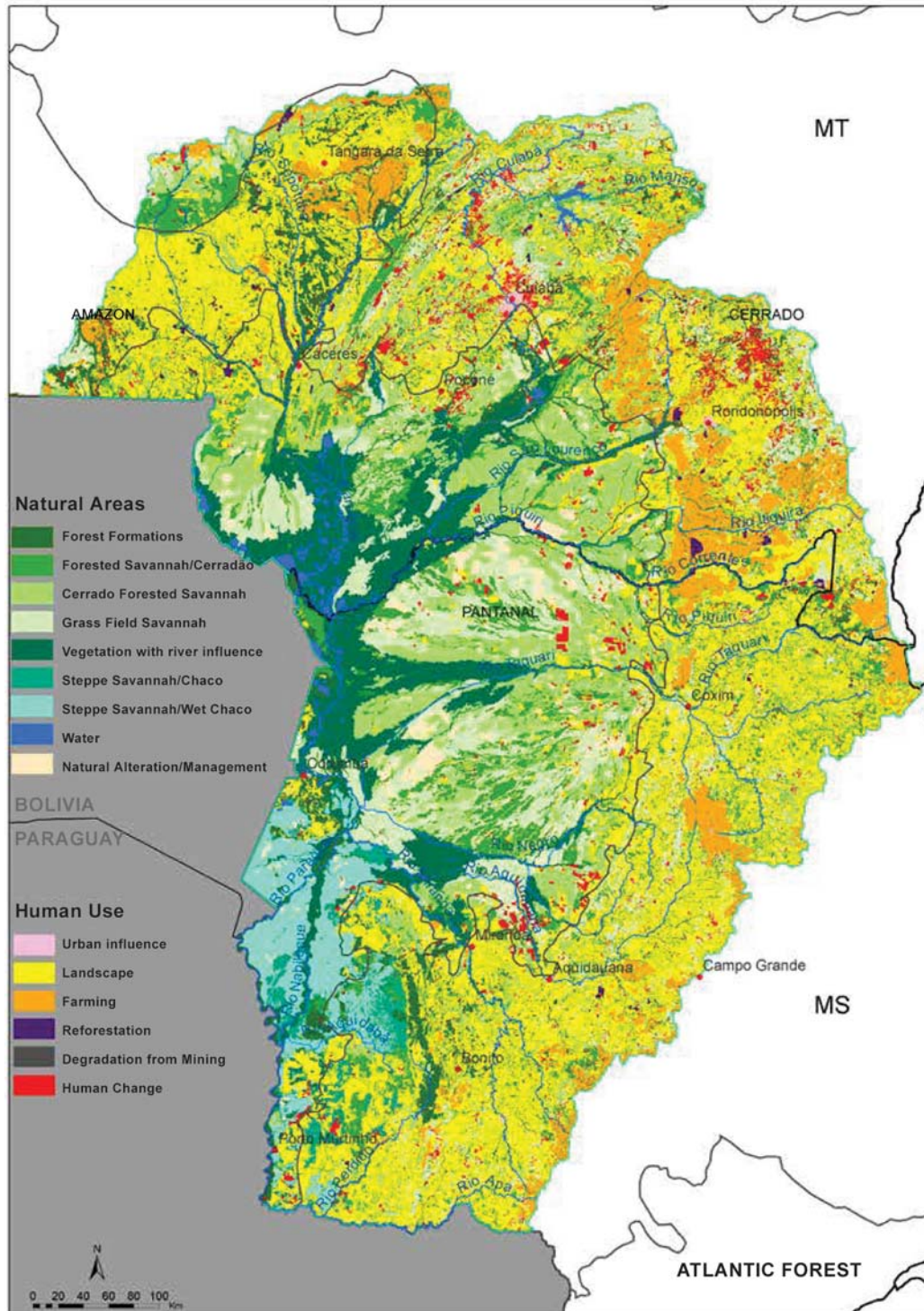
### Cattle Herd in the Four Municipalities Studied (head)

	1992	2012	% Growth
<b>Brazil</b>	154,229,303	211,279,082	37
<b>Mato Grosso</b>	10,138,376	28,740,802	183
Alto Paraguai	38,599	66,884	73
Cáceres	429,400	920,179	114
Diamantino	37,975	103,873	173
Poconé	250,000	410,446	64

Source: IBGE

Cattle ranching continues to be the main economic activity in the region. Originally, cattle ranching in the Pantanal used natural pasture areas, with native grasses and reduced impact on the environment. In recent decades, this practice has been replaced by use of exotic species, such as brachiaria grasses. Just as on the plain, cattle ranching was the major factor responsible for the deforestation that has occurred to date in the UPB plateau region, as shown by the following map.

## Map of Natural Vegetation and Soil Use in the UPB – 2012



Source: WWF, 2014.

## Sugarcane

Sugarcane production in Mato Grosso is not significant in relation to other crops in the state, nor to its production in the country. There were close to 302 thousand hectares according to Canasat/Inpe<sup>2</sup>, which corresponds to only 3% of the surface planted in Brazil, which was 8.5 million hectares in the 2012/2013 harvest (CONAB, 2013).

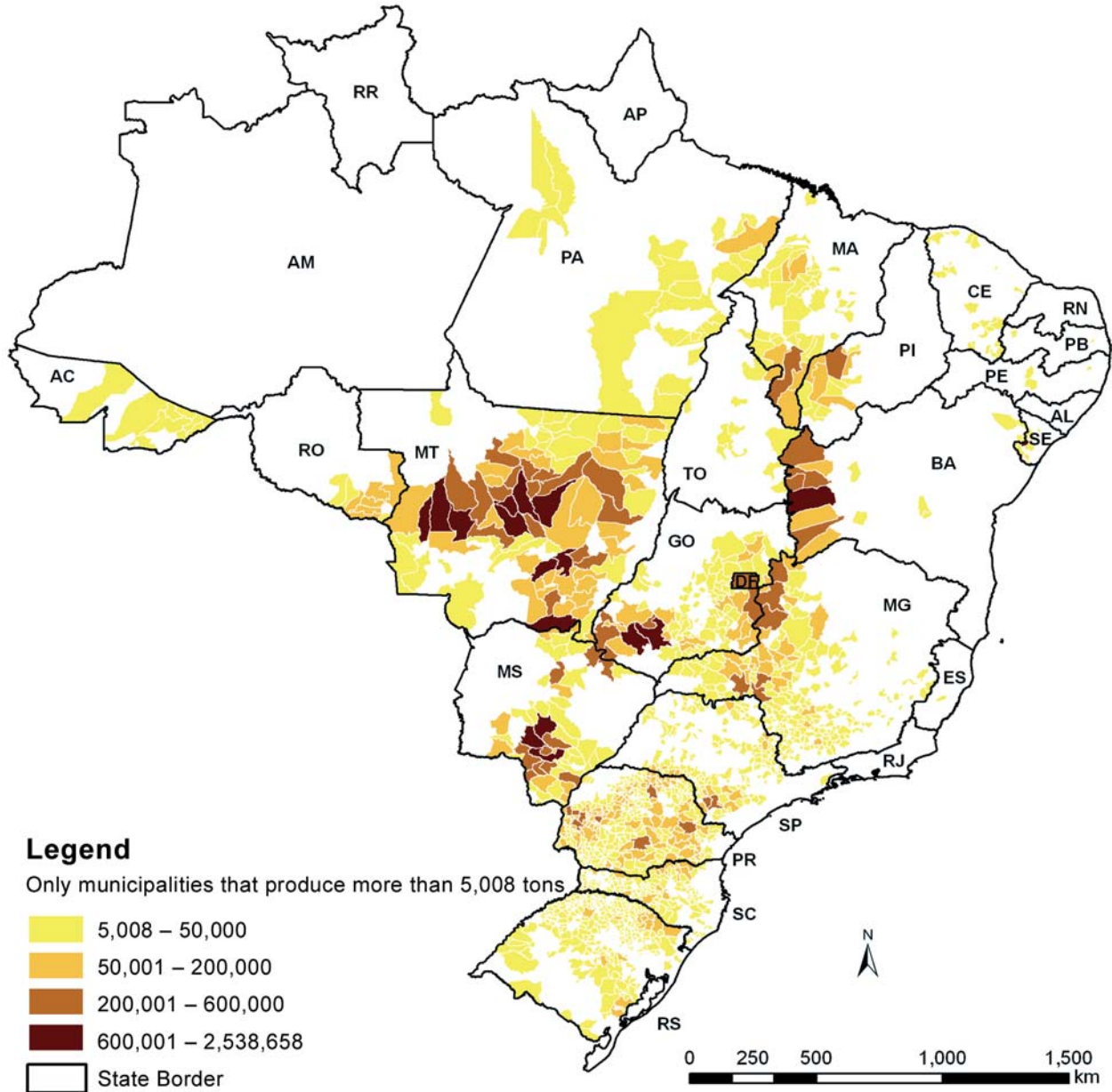
<sup>2</sup> <http://www.dsr.inpe.br/laf/canasat/tabelas.html>

In Mato Grosso do Sul, the area planted with sugarcane, in the same period, was approximately 755 thousand hectares according to Canasat/Inpe, which corresponds to approximately 9% of the total planted area in Brazil. However, in Mato Grosso, close to 80% of all sugarcane planted is in municipalities located in the UPB (226 thousand hectares). In the case of Mato Grosso do Sul, the 149 thousand hectares planted in municipalities in the UPB correspond to 23% of the total planted in the state.

# Corn and Cotton

Corn and cotton are planted in rotation with soybeans in the Mid-Western region. Although they partially occupy the same areas as soybeans, the planting of soybeans is what determines the opening of new areas. It is important to mention, however, that their production in the region, and the consequent need for transport, result in greater pressure to build the Paraguay-Paraná waterway, as well as in additional use of pesticides and fertilizers.

## Corn Production in the 2013/2014 Harvest



Source: Conab/IBGE.



## Area Occupied by Corn and Cotton in MT and MS during the 2013/2014 Harvest (thousand hectares)

	Corn	Cotton
MT	3,423	591.7
MS	1,487	39.9

Source: Conab, 2014.

## Eucalyptus

The planting of artificial forests is another monoculture with a growing presence in the region. Although there is no specific information on planting in the Upper Paraguay Basin area, it is noteworthy that Mato Grosso do Sul is already the state with the fifth largest area planted with eucalyptus and pine in Brazil. The planted area in this state went from 148 thousand hectares to 597 thousand in only six years, between 2006 and 2012, according to the Brazilian Association of Planted Forest Producers (ABRAF, 2013). In the UPB, cultivation of eucalyptus and pine is concentrated in the municipalities of Aquidauana, Anastácio and Dois Irmãos do Buriti.

### Expansion of Area Planted with Pine and Eucalyptus between 2006 and 2012, MS and MT (thousand hectares)

	2006	2012
MS	148	597
MT	46	60

Source: 2013 ABRAF Yearbook.

The municipality of Três Lagoas has become a large pulp production center in Mato Grosso do Sul. Três Lagoas produces 1.3 million tons of pulp per year, with the largest part exported by Fibria and the remainder supplied directly to neighboring International Paper, from where 200 thousand tons of paper is shipped per year.<sup>3</sup> Although Três Lagoas is not located in the UPB, paper and pulp production represents additional pressure demanding increased transportation infrastructure in the region.

## The Paraguay-Paraná Waterway

The Paraguay-Paraná waterway today daily transports significant amounts of iron ore and manganese between the ports of Ladário and Corumbá (MS), and the mouth of the Apa River on the border with Paraguay. Most of the works planned for the next years are concentrated in the stretch between Corumbá and Cáceres. These works are designed to allow navigation of vessels with greater drafts throughout the year on the Paraguay River, starting at Port of Morrinhos, in Cáceres. They include dredging, regularization of the riverbed, rock removal and, especially, modification of the natural canal (Ministério dos Transportes, 2013). The works, as well as navigation by larger vessels, will have a strong impact on the natural characteristics of the river, such as water speed and flood pulse.

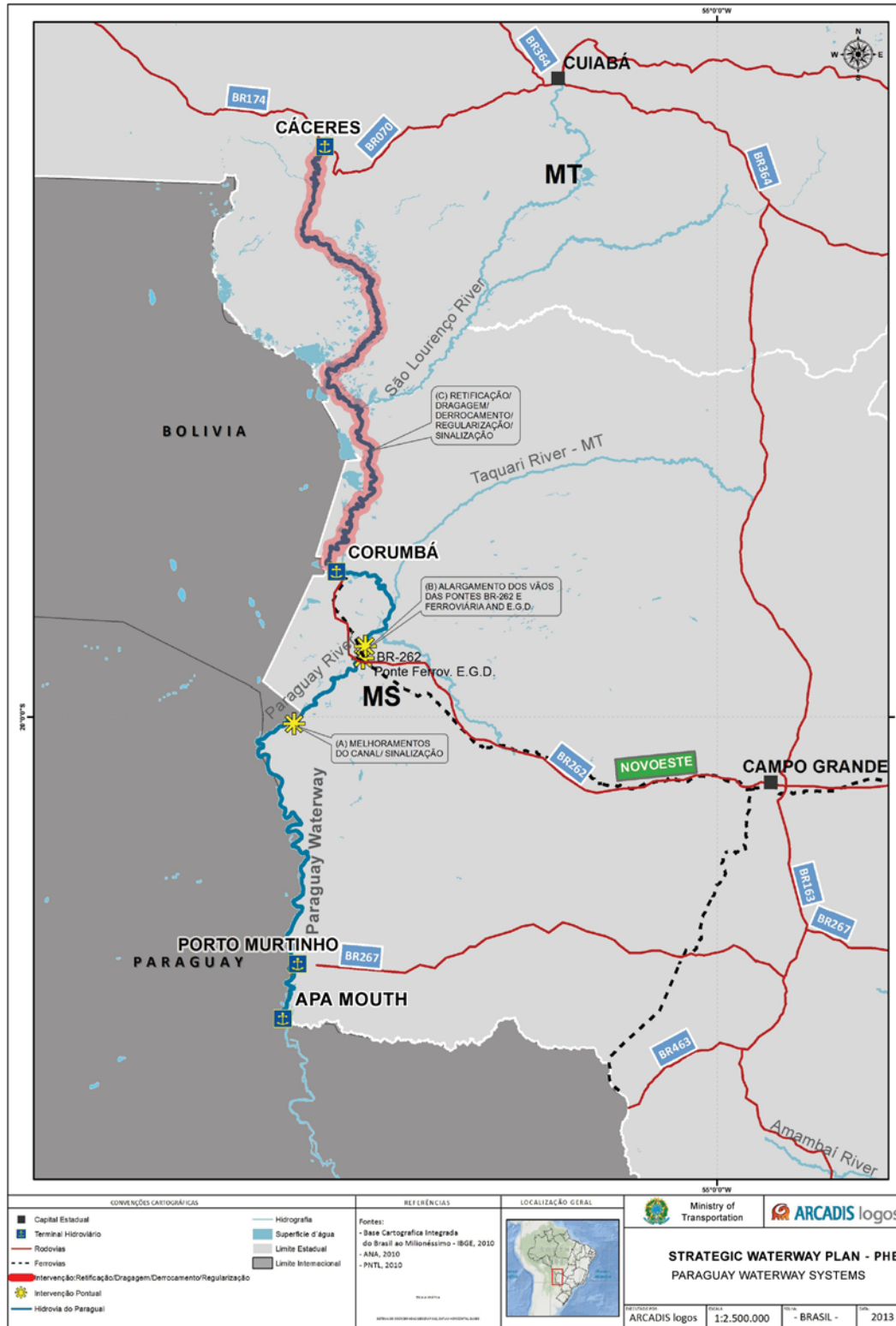
For many years, civil society organizations were able, through the courts, to impede the works. However, in December 2013, the Federal Regional Court definitively denied a Federal Public Ministry appeal that would prevent environmental licensing of the Port of Morrinhos, located 86 km from the Cáceres municipal seat, the main project focused on shipping production by means of the waterway. With this, completion of an Environmental Impact Study and Environmental Impact Report (EIA-Rima) is no longer necessary for each project along the route, as provided for by the prior decision.<sup>4</sup>

<sup>3</sup> <http://epocanegocios.globo.com/Revista/Common/0,,ERT177058-16642,00.html>

<sup>4</sup> [http://www.olhardireto.com.br/agro/noticias/exibir.asp?noticia=TRF\\_nega\\_recurso\\_do\\_MPF\\_em\\_acao\\_movida\\_por\\_Taques\\_e\\_libera\\_licenca\\_do\\_Porto\\_de\\_Morrinhos&id=11990](http://www.olhardireto.com.br/agro/noticias/exibir.asp?noticia=TRF_nega_recurso_do_MPF_em_acao_movida_por_Taques_e_libera_licenca_do_Porto_de_Morrinhos&id=11990)

The federal government's Accelerated Growth Program (PAC 2) includes, in addition to dredging works, studies and projects for implementation of cargo terminals, from Cáceres to Mato Grosso do Sul. A variety of organizations linked to agribusiness have been pressuring the federal government to release the funding necessary for undertaking the works. The topic is on the list of priorities of entities like the Agriculture and Livestock Federation of the State of Mato Grosso (Famato), Association of Soybean and Corn Producers of the State of Mato Grosso (Aprosoja) and the Agriculture and Livestock Parliamentary Front (FPA).

## Works Planned for the Paraguay-Paraná Waterway



Source: Ministry of Transportation.

In addition to the works along the Paraguay River, there are also studies conducted by the Federal University of Santa Catarina, at the request of the Ministry of Transportation, designed to extend the waterway, by means of the Cuiabá River, a tributary of the Paraguay River, to the city of Rosário d'Oeste, in Mato Grosso (Antaq, 2013).

The region of the UPB around Cáceres would be most impacted, both by these transportation works and by the increased interest in land closer to the new port, attractive for gain cultivation due to the reduced cost of transporting production. Later, in the section dedicated to the municipality of Cáceres, we will analyze the impacts of the number of construction works for the waterway and its related infrastructure.

## Mining

There are a variety of mining activities in the Upper Paraguay Basin, with consequences like pollution and silting of the rivers. Gold, diamonds, iron, manganese and limestone stand out.

In the northern portion of the UPB, diamond and gold mining is still significant today. Engaged in primarily by companies, mining is the cause of pollution and silting of the rivers, as has occurred in the municipalities of Alto Paraguai, Poconé and Diamantino, among others. In Mirassol d'Oeste, the recent discovery of large deposits of iron ore and phosphate is a reason for major concern on the part of the rural population, as we could see on a visit to the Roseli Nunes settlement.

## Hydroelectric Power Plants

According to biologist Dr. Débora Calheiros, there are currently 44 dams located on rivers in the UPB and there are 110 new projects under analysis, totaling 154 dams.<sup>5</sup> “Each project is separately licensed and this is worrying because it does not allow an overall view.”<sup>6</sup> The concern is that these projects will affect the dynamics of the cycle of rivers forming the Pantanal plain, as well as the hydrodynamics of the Pantanal system as a whole.

Furthermore, according to Débora, damming rivers for power generation, especially when several dams are constructed on the same river, is the major factor with regard to maintaining the flood flow on the plain and the factor that governs the ecological functioning of the Pantanal. This view is shared by a number of experts in fish ecology and fishing management, who expressed their concerns at a meeting organized by the Chico Mendes Institute for Biodiversity Conservation (ICMBio) in May 2014:

The hydroelectric power generation projects proposed for the basin have the potential to alter the water cycle of the Pantanal in quality and quantity, consequently affecting the fish, fauna and flora of the region and, as a consequence, its social and economic activities. These effects can occur at the site, upstream or downstream of the projects, both in an immediate way, or in a manner perceivable only in the medium and long terms.”

The negative impacts include interfering with the free movement of migratory fish between their spawning, growth and feeding areas. As a result of dams, modifications upstream occur from the sudden transformation of rivers into lakes, changing physical and chemical patterns of water and the distribution of organisms. Consequently, dams lead to alteration of the species mix, with a high proliferation of some and reduction or extinction of others. In the stretch below the dam, the impacts are even worse, since the reservoirs promote redistribution of flows, raising the minimum level of the river during droughts and reducing it during floods, undermining the connection of the river with the aquatic environments along the banks, compromising the reproduction, feeding, recruitment and production processes and biodiversity as a whole.”<sup>7</sup>

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5 <http://oglobo.globo.com/sociedade/ciencia/obras-de-hidreletricas-desvio-de-curso-de-rios-alarmam-ambientalistas-no-pantanal-12988365#>

6 [http://www.ihuonline.unisinos.br/index.php?option=com\\_content&view=article&id=3545&secao=345](http://www.ihuonline.unisinos.br/index.php?option=com_content&view=article&id=3545&secao=345)

7 [http://www.cpap.embrapa.br/pesca/online/PESCA2014\\_VI\\_OFICINA.pdf](http://www.cpap.embrapa.br/pesca/online/PESCA2014_VI_OFICINA.pdf).



# Fishing at Risk

Fishing is one of the main social, economic and environmental activities realized in the UPB, where it is practiced in the professional-artisanal, amateur (or sporting) and subsistence modalities. More than 14,000 professional fishermen, according to Embrapa Pantanal (2013) are involved in the activity in the basin, with 9,500 in Mato Grosso and 4,700 in Mato Grosso do Sul, according to records of the Ministry of Fishing and Aquaculture in August 2012. All were working in an artisanal fishing regime.

In recent years, fishing has been suffering the impact of the various activities already mentioned, particularly those occurring in the plateau areas. The result has been river silting and pollution from pesticides, threatening the survival of fish eggs and larvae, and an increase in the nutrient load, with loss of biodiversity. Fragmentation of the rivers by dams that impede migrations and eliminate spawning fish is considered the main cause of the reduction of fishery production. It also causes a change in the flood flow and transport of sediments and nutrients, with effects on the entire ecosystem. Another threat to fishery activity is the so-called Law of the Pantanal, a bill sponsored by Senator Blairo Maggi, which we will address below.

## Basic Sanitation

According to the National Water Agency (ANA, 2010), close to 2.2 million people lived in the Paraguay Water Region in 2010, a number equal to 1.1% of the Brazilian population, with 87% in urban areas. Only 29% of the population in the water region were connected to the sewage network, far below the national percentage (46%).<sup>8</sup> Nineteen percent of the region's sewage is treated, also below the national average, which was 30%.<sup>9</sup>

Another issue that merits attention is the pollution caused by industrial waste, mainly that generated by slaughterhouses, increasingly present in the region. Growth of the swine herd is also worrying. The raising of pigs in pens represents a high risk of water resource contamination.

### Swine Herd (head)

	2002	2012	% growth
Brasil	31,918,749	38,795,902	21.5
Mato Grosso do Sul	787,960	1,205,455	53.0
Mato Grosso	1,034,608	1,789,390	63.0

Source: IBGE.

## New Laws and Regulations

New legal provisions, if approved, may accelerate the deterioration of the ecological processes that govern the Pantanal and the traditional means of subsistence of its people.

Bill No. 750/11, sponsored by Senator Blairo Maggi and known as the Law of the Pantanal, copies a number of worrying aspects found in Mato Grosso State Law 8830, of 2008, and adds others. In addition to not fighting the true factors reducing fishery resources in the region, its temporary provisions provide for a 5-year moratorium on fishing in the Pantanal. In the view of different social and fishermen organizations in the region, this prohibition originates from pressures by sectors tied to tourism and agribusiness, which want to eliminate it in favor of sports fishing and pisciculture (Arach, 2014).

By not recognizing the intimate relationship between the plateau areas and the Pantanal plain, the bill violates the Water Resources Law (9433/97), which determines that the territorial unit for planning and management should be the water basin. Neither does it provide obstacles to expansion of hunting and fishing activities in the UPB plateau area. In addition, it maintains the prohibition against establishing new rural settlements in floodplain areas.

<sup>8</sup> <http://www.ihu.unisinos.br/noticias/518672-coleta-de-esgoto-ameaca-a-meta-fixada-pela-onu>

<sup>9</sup> <http://www2.ana.gov.br/Paginas/portais/bacias/paraguai.aspx>.

Another source of concern is the Mato Grosso Social, Economic and Ecological Zoning. Since February 2012, several legal provisions that established the zoning have been temporarily suspended at the request of the Public Ministry, which when taking such action alleged that the technical studies “presented by the Legislative Assembly as being those that provided support for zoning were divorced from reality, insufficient, contradictory and absurd.” The zoning was also rejected by the Coordinating Commission for Ecological-Economic Zoning of the National Territory, formed by members of 14 ministries, which guides and approves these instruments in Brazil, due to lack of compliance with its methodological guidelines.

According to Inácio Werner, of the Centro Burnier Fé e Justiça, the zoning “reduces conservation areas, with some of them simply ceasing to exist. It reduces indigenous areas, further harming the peoples. It allows planting of sugarcane anywhere in the state, contrary to current legislation that protects the Pantanal and the Amazon from this type of agricultural production.”<sup>10</sup>

The process of the Sugarcane Agroecological Zoning bill that prohibits expansion of cane planting in the Amazon and Pantanal biomes, as well as in the UPB, also merits attention. The zoning was established by presidential decree in 2009 and, at the same time, sent to the congress to be transformed into law. The agribusiness caucus in congress has proposed amendments to the bill that allow expansion of cane in degraded areas of these biomes.

A new Mining Code is also working its way through congress. With it, the federal government intends to establish the 2030 National Mining Plan, for the purpose of expanding mining by somewhere between three and five times the current production in Brazil.

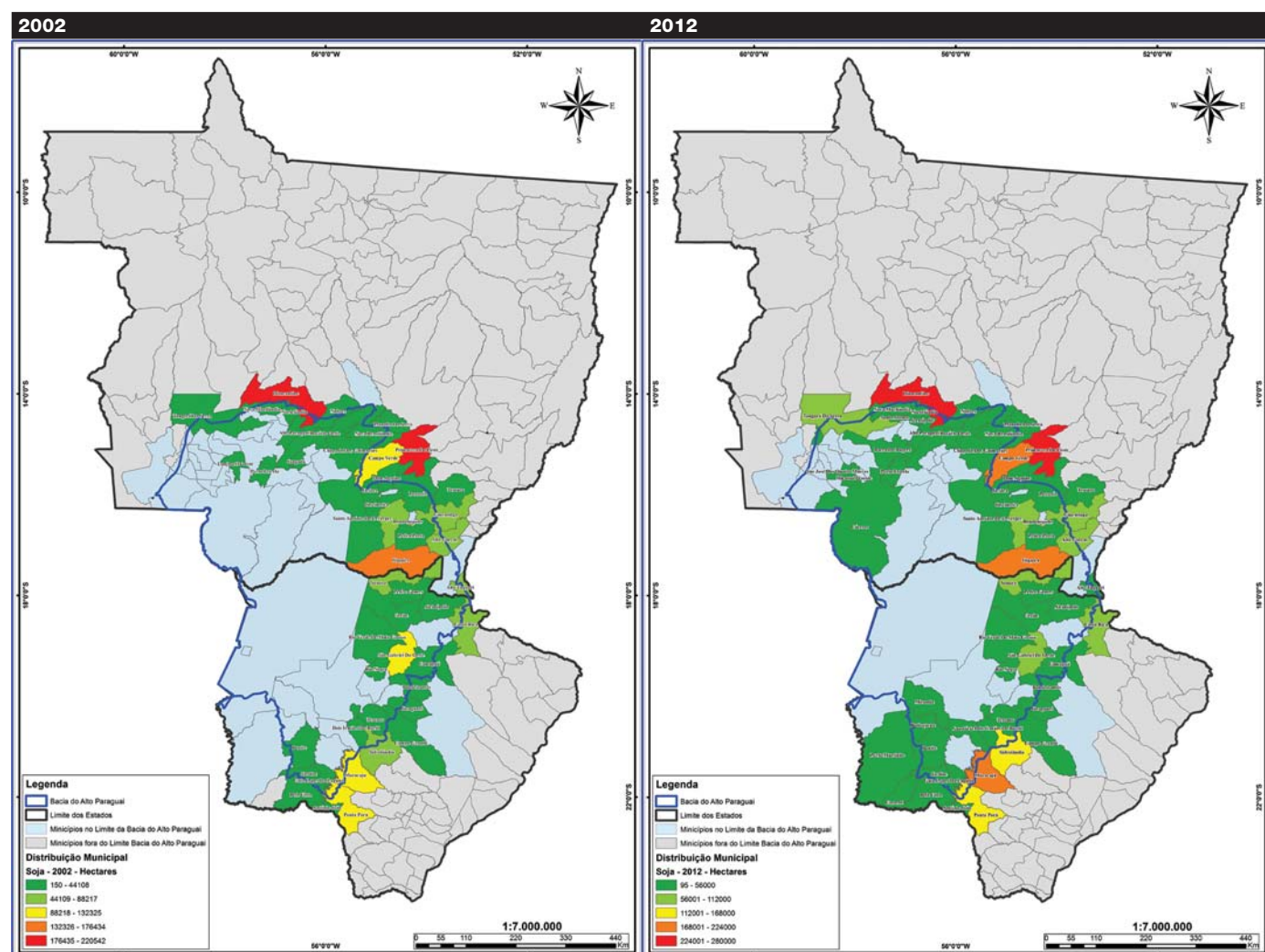
## Soybeans in the Upper Paraguay Basin



Field of soybeans in Diamantino

<sup>10</sup> <http://www.ihu.unisinos.br/noticias/noticias-anteriores/38042-sociedade-civil-repudia-zoneamento-socioeconomico-e-ecologico-de-mato-grosso>

## Area Planted with Soybeans in the Municipalities of the Upper Paraguay Basin – 2002 and 2012



Source: IBGE. Art: ICV.

In Brazil, according to the IBGE<sup>11</sup>, the total area of soybean cultivation in 2012 was 25 million hectares. In Mato Grosso, it was approximately 7 million hectares. And in Mato Grosso do Sul, 1.8 million.

In Mato Grosso, the area planted in soybean in the municipalities within the UPB in 2012 was 1.6 million hectares, with growth of 33% from 2002 to 2012. In 2012, soybeans planted in the UPB-MT represented close to 22% of the total area planted with soybeans in the state. In Mato Grosso do Sul, the area planted in soybean in the municipalities within the UPB in 2012 was 879 thousand hectares, and growth from 2002 to 2012 was close to 39%. In 2012, soybeans planted in the UPB-MS represented close to 48% of the total area planted with soybeans in the state. Combined, the areas planted with soybeans in MT and MS represented almost 10% of the total area planted with soybeans in Brazil.

### Expansion of Soybean in the UPB, 2002-2012

	2002	2012	2002-2012
Total UPB MS	631,378	879,150	39%
Total UPB MT	1,183,356	1,568,067	32%
Total UPB	1,814,734	2,447,217	35%

Source: IBGE.

<sup>11</sup> The information on the cultivation of soybeans and others produced by CONAB are more up-to-date than those presented by the IBGE. However, only the IBGE provides, through its database, data on production by municipality. For this reason, the information presented here on soybean cultivation in the UPB is that provided by the IBGE.



## Why so much soybean?

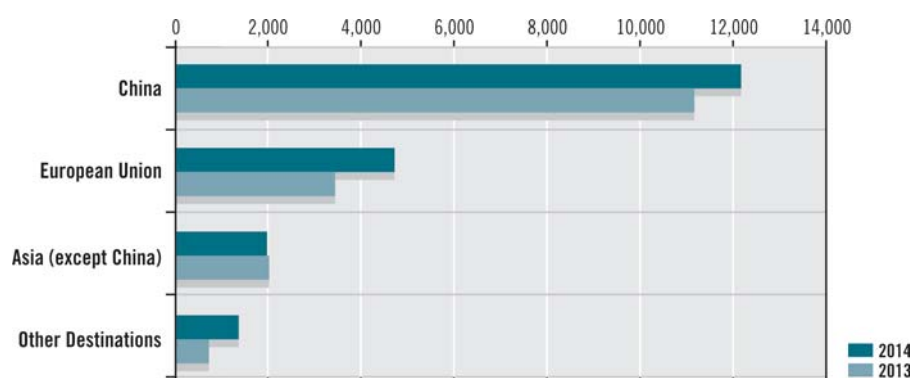
Soybean is the agricultural crop that, overall, has grown at the fastest pace in recent decades, stimulated by the strong increase in meat consumption, mainly in the so-called emerging countries. It is estimated that 90% of the soybeans produced in the world are used for production of meal for animal feed, as a source of protein.

The crop is concentrated in a few number of countries. The United States, Brazil and Argentina account for 80% of production and 85% of global exports, according to data from the U.S. Department of Agriculture (USDA). China is the largest importer. Its purchases represent 63% of all global trade. The European Union is in second place, with 12%. Brazil has alternated with the United States in recent years as the largest exporter of soybeans.

Soybeans are increasingly important in Brazilian exports. Total sales of the complex (beans, meal and oil) reached US\$ 30.96 billion in 2013, corresponding to 31% of the agricultural sector's foreign sales and 12.8% of total Brazilian exports. The amount exported was 57.5 million tons, or 70% of Brazilian production during the 2012/2013 harvest.

Commercialization is also strongly concentrated in a small number of companies. In the case of Mato Grosso, exports of only five companies accounted for 51.7% of the state's total agricultural exports in 2013; the multinationals Bunge, ADM, Cargill and Dreyfus and the Brazilian Amaggi.<sup>12</sup> The main destination of Brazilian soy complex exports are China and the European Union, as indicated on the following graph.

### Destination of Brazilian Soy Complex Exports (US\$ billion)



Source: Abiove.

The municipalities of the Upper Paraguay Basin accounted, in 2013, for 6.7% of the soybeans exported by Brazil. Of exports to China, this percentage was 7.4%. And to the European Union and the Netherlands, 3.3%.

### Destination of Soybeans Exports from the UPB – 2013 – tons

	China	EU	Netherlands	Others	Total
Total UPB	2,379,364	169,323	52,977	327,770	2,876,457
Total Brazil	32,247,228	5,141,926	1,585,897	5,511,262	42,900,416
% UPB	7.4	3.3	3.3	5.9	6.7

Source: Aliceweb – MDIC

The state of Mato Grosso is the largest producer of soybeans in the country, with a forecasted area of 8.4 million hectares for the 2013/2014 harvest, representing more than 28% of the area occupied by soybeans in Brazil, and a 7% increase in relation to the prior year. Mato Grosso do Sul is the fifth largest producer, and the area forecast for the next harvest is 2.1 million hectares, 5.1% higher than that of the 2012/2013 harvest (Conab, 2014).

<sup>12</sup> <http://www.navegadormt.com/noticia.php?codigo=27673&categoria=Agronegocio>

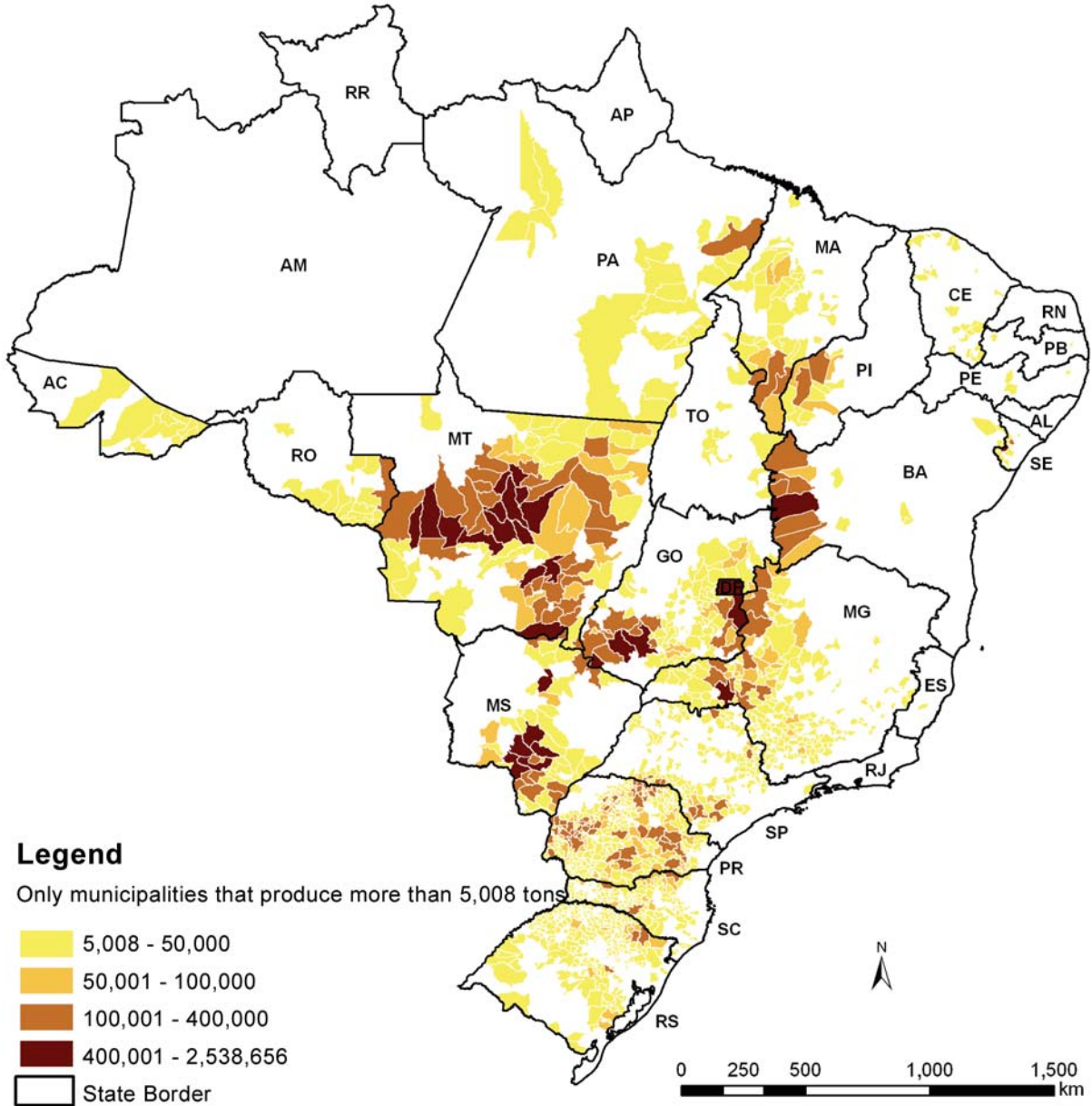
# Forecasts

The official forecasts of the Ministry of Agriculture (MAPA, 2013) indicate that, between 2013 and 2023, Brazilian production should grow 22%. With this, the area planted with soybeans should increase 6.7 million hectares, reaching 34.4 million hectares in 2023, an increase of 24.2% in relation to the area occupied during the 2012/2013 harvest.

The main area of expansion should be that called Matopiba, because it includes land located in Maranhão, Tocantins, Piauí and Bahia. Mato Grosso should lose strength in this expansion process, due primarily to the prices of land in this state, which are more than double agricultural land prices in the Matopiba states. Since the new projects include vast areas, the price of land is a decisive factor.

With regard to the Upper Paraguay Basin, Aprosoja, in news published in July 2013, highlights the fact that the possibilities for expansion of soybean production in the Jauru Valley, which includes municipalities such as Figueirópolis d'Oeste, Rio Branco, Cáceres, Lambari d'Oeste, Jauru, Mirassol d'Oeste, São José dos Quatro Marcos and Reserva do Cabaçal, are especially favorable.<sup>13</sup>

## Soybean Production during the 2013/2014 Harvest

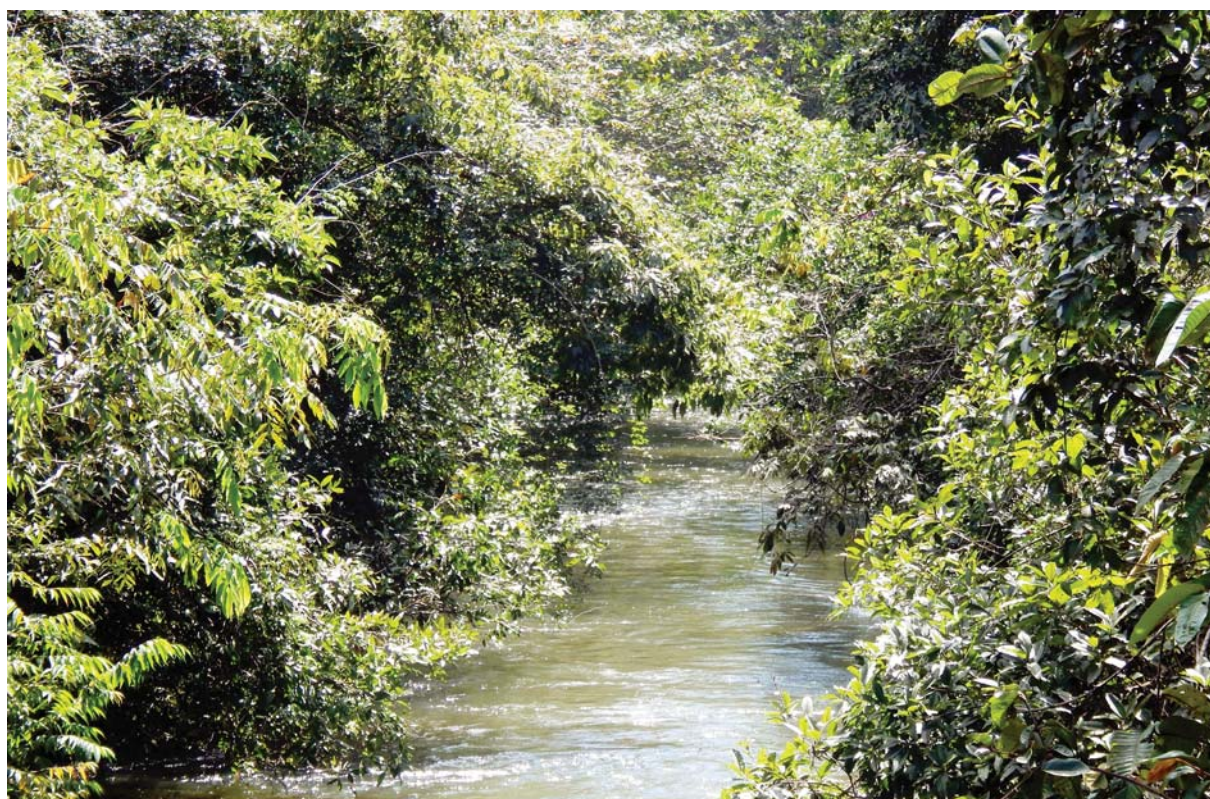


Source: Conab/IBGE.

# Diamantino and Alto Paraguai: The Headwaters of the Paraguay River

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The Paraguay River springs from the Araporé Mountains, on the southern slope of the Parecis Mountains in Mato Grosso. The region of these headwaters extends over a marshy plateau called Brejal das Sete Lagoas, where the Prata and Amazon basins separate. The Diamantino, Cuiabá, Sepotuba, Cabaçal and Jauru Rivers also spring from this region, which are part of the Prata basin, and the Arinos, Parecis, Sangue, Papagaio, Buriti and Juruena Rivers, tributaries of the Tapajós River in the Amazon basin<sup>14</sup>.



Headwater area of the Paraguay River

The initial core of the seat of the current municipality of Diamantino, located only 30 km from the headwaters of the Paraguay River, was established in 1728 with the discovery of gold, followed by diamonds, in the region. In 1820, the settlement became Vila de Diamantino, the third town created in Mato Grosso. The region was inhabited by different indigenous peoples, such as the Paresis, Kaiabis, Nambiquaras and Apiakás. They would soon be decimated or enslaved for work in the mines, together with blacks brought from other regions.

Over the centuries, the region would experience different economic cycles: gold, rubber, diamonds, livestock and, today, agriculture. Until 1950, it would maintain its original surface area of over 100 thousand square kilometers. Thereafter, but especially starting in the 1980s, Diamantino would be successively dismembered to form another fifteen new municipalities (Sobrinho, 2006).

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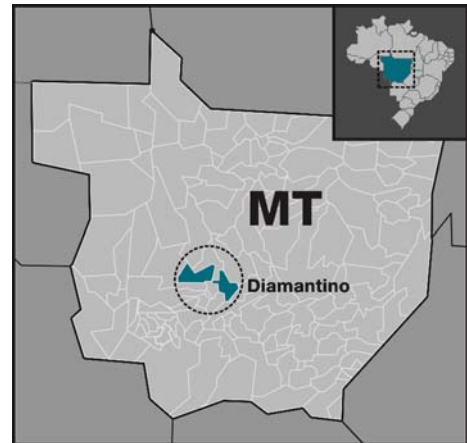
<sup>14</sup> <http://www.portalpantanal.com.br/riosprincipais/94-rioparaguai.html>



# Diamantino

Starting at the end of the 1960s, the Diamantino region, just as others in Mato Grosso, received a large number of immigrants from other parts of the country, mainly the South and Southeast regions, attracted by the federal government's so-called colonization programs that offered incentives for agricultural activities (Passos et al., 2006). In the second half of the 1980s, land reform settlements also began to be established.

So a mosaic of peoples of different origins formed, which needed to share land and water in the region. On one hand, immigrants and their descendents who, with the incentives received from the federal government, became large rural producers. On the other, small farmers, settlers, indigenous and maroon communities, whose productive activities are mainly family farming and fishing.



Thus, since the 1970s, Diamantino began to become a large producer of grains like soybeans, corn and cotton. A milestone of this period was the founding, in 1975, of the Itamarati Norte company in the municipality. Its owner was the businessman Olacyr de Moraes who, years later, would be known as the soybean king. In the 1980s, Olacyr became the largest individual producer of soybeans in the world. In Diamantino, the company occupied a total area of 110,000 hectares, where it primarily produced soybeans, corn and cotton.<sup>15</sup>

In addition to grains, the region began to be occupied, still in this period, by sugarcane. In 1980, the Diamantino Cane Producers Agricultural Cooperative (Coprodia) was founded. With the progressive dismemberment of areas of Diamantino the land occupied by Coprodia is today located, for the most part, in the municipality of Campo Novo do Parecis, in headwater areas of the rivers in the Amazon basin. In 1987, the Libra plant was established in Diamantino, whose land also extended into the neighboring municipality of São José do Rio Claro (Cruz, 2012).

## Diamantino Today

Diamantino is currently a municipality of close to 21,000 inhabitants, whose main activities are farming and ranching. In agriculture, the production of soybeans, corn and cotton stand out. In ranching, cattle and pigs. In agribusiness, large companies are present, with a JBS slaughterhouse and new investments by the Amaggi group, in a complex designed for grain storage, standing out.<sup>16</sup>

## Soybeans in Diamantino

Soybean production occupies the largest agricultural area in the municipality. For the 2013/2014 harvest, the Mato Grosso Institute of Agricultural Economics (Imea) estimates that Diamantino will be the municipality with the fifth largest soybean area in the state, totaling 366,700 hectares.<sup>17</sup>

In addition to the Amaggi group, other large companies are active in the sector. The SLC Group, from Rio Grande do Sul, occupies, between its own and leased areas, more than 48,000 hectares planted with soybeans, corn and cotton, in its Paiaguás and Pejuçara farms. Also present are: the Bom Futuro Group, the largest soybean producer in Mato Grosso, with an area greater than 200,000 hectares, belonging to the cousins of Senator Blairo Maggi; Agropecuária Vanguarda, which has Otaviano Pivetta, mayor of Lucas do Rio Verde, as majority partner, with the Guapirama and Sete Placas farms, which total 30,300 hectares; and the El Tejar Group (Telhar Agropecuária, in Brazil) headquartered in Argentina, which grows more than 600,000 hectares of soybeans on its own and leased lands in that country, Brazil, Uruguay and Bolivia.<sup>18</sup>

<sup>15</sup> <http://www.olacyrmoraes.com.br/biografia-olacyr-de-moraes.php?id=2#.U0KhqvlidWVM>

<sup>16</sup> <http://www.diamantino.mt.gov.br/Noticias/1830/>

<sup>17</sup> [http://www.imea.com.br/upload/publicacoes/arquivos/R404\\_\\_05\\_12\\_13\\_Tratamento\\_semeadura\\_13-14.pdf](http://www.imea.com.br/upload/publicacoes/arquivos/R404__05_12_13_Tratamento_semeadura_13-14.pdf)

<sup>18</sup> [http://www.suinocturaindustrial.com.br/noticia/dumping-social-na-el-tejar/20100428091512\\_Z\\_431](http://www.suinocturaindustrial.com.br/noticia/dumping-social-na-el-tejar/20100428091512_Z_431)

Several of these large properties are in source areas of the Paraguay River. In 2011, the Public Ministry in the state, through the 2<sup>nd</sup> District Attorney of Diamantino, sued the Mato Grosso government, demanding effective implementation of the Permanent Preservation Area for the sources of the Paraguay River. In the suit, evidence that soybean farms extend to approximately 10 meters of the sources is presented, and that during the rainy season, pesticides used in the planting of the grain are carried directly into the river. Property inspections conducted by the Public Ministry, included land currently leased to Vanguarda by the Zortea group, and land owned by Talher. In a portion of the suit, it states that:

*“The photos that accompany the report attached to the suit make it clear that deforestation in the headwaters of the Paraguay River goes far beyond permitted rates, making immediate recovery of the already degraded areas necessary.”*

In our field study, we observed that the suit had not produced the expected results. These headwater areas continue to be illegally occupied by the large farms, both in Diamantino and in Alto Paraguai, as we describe later.

The prospect of extending navigation on the Paraguay-Paraná waterway to the Port of Morrinhos, as well as extension of the highway network in the region, may certainly accelerate expansion of soybean cultivation in Diamantino and neighboring municipalities. And this expansion should make the lives of its rural population even more difficult, something we will focus on below.

## Pesticides in the Sources

In addition to the reduced volume of water as a result of deforestation, the population of Diamantino is also facing its contamination by pesticides. Jacildo de Siqueira, responsible for public health surveillance for the Municipal Health Secretariat of Diamantino, tells us that, in spite of the fact that the municipality is not equipped to detect and prove the presence of pesticides in the water, the presence of soybeans in source areas is worrying:

*“We already have a large water problem here in the municipality. All this soybean planting and mining is all spreading toward three locations where water is captured to supply Diamantino, the Areinha stream and the Caju stream. Agribusiness is in their surroundings. The Diamantino River and the recreational area closest to the city are already compromised. It is a problem that we are already discussing here, but I believe that there is a lack of commitment, because we are talking alone, there is resistance.”*

Itamar Bonfim, who has held the position of Health Secretary in the municipality for eight years, recognizes the problem and expresses his concern:

*“We still haven’t paid attention to this, we have no analysis, no action focused on this. Some types of diseases may be connected to this. We still do not know, have not studied, because there is a lot of water here and we are surrounded by large farms. We have a different perspective on health, and we have to see how we are going to resolve this with the producers, because people already think this will be a problem for production. In the region (Diamantino Regional Health Office) there are records of deaths from stomach cancer. Caused by what? The water? We have to look for answers to these questions and deal with the problems in partnership with the bodies in the area.”*

Aparício Valeriano De Siqueira, General Coordinator of the Union of Family Agriculture Workers of Diamantino (Sintraf), also notes the difficulty that exists in overcoming the power of the business community in the region, with respect to identification of the origin of the occupational health problems in Diamantino and the neighboring municipalities growing soybeans:

*“What is happening here is that these events are being hidden. A few days ago, we participated in a meeting of the Regional Health Forum, which involves seven municipalities in the region, on worker health, and the accusations that are being made are serious, involving slaughterhouses and farms. And here in Diamantino, the problem is deviation of the diagnosis of workers who arrive after exposure to pesticides. They put another cause. The cases of poisoning by pesticides do not appear in the health center and hospital reports. They are prohibiting the doctors from providing the workers with medical certificates. The employees themselves are told not to make accusations about the contamination, under threat of being fired.”*

# Family Farming

In Diamantino, as Antonio Martins tells us, close to 600 families live in rural settlements. There are also close to 600 to 700 small rural properties, of which approximately 30% are family farm production units, with self-employed professionals, public employees and others living in the others. The main family farm products are milk, cassava, banana and small animals. Small-scale pisciculture and vegetable production for the federal government food purchasing programs has also been growing in recent years. These families are in the surroundings of the municipal seat, in a radius of approximately thirty kilometers, a distance that offers good potential for attending to the local food consumption needs. The capital Cuiabá, located 180 kilometers from Diamantino, strengthens this potential consumer market. Aparício, from SINTRAF, tells us that:

*“What we see on the small properties today are grass and fences. Those who are still raising dairy cattle manage to survive. The traditional communities no longer plant subsistence crops: rice, beans, corn. The allegation is that the cost is very high, there is no profit. At the market, you see the scarcity of local products. Here, watermelon from Goiás is sold, oranges are coming from São Paulo, beans from Maranhão, rice from Sinop (MT).”*

*“I participated in a meeting with supermarket owners in Cuiabá. They begged us to plant using the least amount of poison possible, to even make the transition to organic agriculture. We invited them to come to Diamantino, and they met with the people here. They want to take the production there, because they are not receiving it. They are bringing product from Goiás and São Paulo, but they want production from here in Mato Grosso, with the use of less poison.”*

The testimonies gathered, however, point to a number of difficulties for production and commercialization of family farming. In particular, the lack of support by the municipal and state governments and the growing presence of the soybean, corn and cotton monocultures that prevail in the rest of the municipal territory and already occupy a large part of the belt around the city, where most of the family farms are located.

The largest settlements in Diamantino, those of Bojuí and Caeté, concentrate more than 500 of the 600 families settled in the municipality. In our field studies, we visited the Caeté and Piraputanga settlements. The latter is a small community located in a region far from these monoculture areas.

## The Caeté Settlement

At the Caeté settlement, where 236 families live, we found a variety of problems resulting from living alongside soybeans. In addition to being present in the large farms in the surroundings, the crop is also found in areas leased to various settlers. Pollution and the reduction of water are the main problems mentioned by its residents. The same occurs in almost all the Diamantino settlements, such as Bojuí, the largest of them.

Food production was never easy in the settlement. A lack of credit, low quality soils and scarce water in various lots are obstacles to production faced since its creation. With soybeans coming closer, the farmers are noticing the reduction of water volume in the rivers and streams and an almost complete disappearance of fish. Rusiveth Martins, Rutimara Cruz de Mello and Odílio João de Souza, who live in the settlement, talk about these problems:

*“In 1998, we had water way up here. There were large fish, but it's all gone. They harrow the land, it dries out, after six months, all that remains is the red earth. And that over there was a little Cerrado, and it had water. And listen, I don't cut down any trees.”*

Odílio

*“Here on the Preto River, when we arrived, we went fishing here in the river for piau, lambari. Today fishing is a lot of work. You go down to the river and can see clear to the bottom, the sand is clear. A few years ago you couldn't see this sand. It appeared to have a black curtain. It was full of piau, all close to each other.”*

Rusiveth

*“This poison burns our eyes. I was riding my motorcycle and the plane passed over the road. Down came that rain of poison, and we had nowhere to run. I couldn't breathe and almost suffocated to death.*

Rutimara

With regard to the water pollution, a resident who preferred not to provide a name observed:

*“I can no longer drink the water there at my house. If you drink it, you get sick. Diarrhea, stomach ache, infection. Meanwhile, the farmer is there in the city, drinking mineral water. When I came here,*



*the water was first class. The problem appeared after they began planting soybeans. The well at my house is shallow, 10, 12 meters, if it rains the poison gets there.”*

The growing scarcity of water and the presence of pesticides, together with the lack of technical assistance, the difficulty in obtaining credit and the consumer market, all make the production of many farmers unviable. Organic food production is becoming impossible. Pesticides used in soybean areas make pests previously unseen attack the production of other crops in the surroundings. Consequently, farmers are often forced to also use pesticides to protect their vegetable gardens from these pests. In addition, desiccants spread over areas planted with soybeans end up also drying out the production of family farmers. And the poison used on the soybeans contaminates the food produced. Odílio, who produces milk, cheese and other foodstuffs to sell door-to-door in the city, talks about these difficulties:

*“It is impossible to produce organic food. If you analyze it, you will find the pesticides used on soybeans. I plant a field here and nothing grows because they throw poison there and it kills here. All the orange trees are dying. I have a neighbor right in front of my house who leased his land for soybeans. I have a vegetable garden, and when they spread the poison, it gets there. I went to the Health Secretariat to complain, they said that nothing can be done, that if it is because of soybeans, there’s nothing they can do.”*

Facing all these problems, the younger generations of Caeté are migrating to the city in search of work, where they have a tough time adapting to a new life. And their parents, who still are looking for alternatives in order to remain in the settlement, also fear they will lose their identity as food producers:

*“Until a few years ago, we went to the city to buy oil, salt and sugar, because we had everything else on the farm. Today, I’m ashamed to have to buy a head of lettuce in the market.”*

Rutimara

## The Piraputanga Settlement

With only nine families, all related, and occupying a total area of 900 hectares, three quarters of which is preserved, the Piraputanga settlement is an exception to the rule, both in terms of its counterparts in Diamantino and the majority of Brazilian settlements. Piraputanga is close to 2 kilometers away from the closest soybean field, and its waters are clean, since they spring from the very settlement and flow into the Cuiabá River.



Piraputanga settlement, Diamantino.

The settlement was created in 1996 to legalize the lands already occupied since the 1950s by Luiz Carlos de Macedo’s family, which welcomed us to the place. Subsequently, it received funds for construction of homes, and the families obtained credit to begin cattle ranching, buy a tractor, a truck and set up a mill. Starting in 1998, they could count on ICV training courses on seed collection and other economic activities that help to preserve the environment. Recently, the settlement signed a contract with the incubator of solidarity economic enterprises of the Federal University of Mato Grosso (UFMT) to receive technical assistance from food engineers and other specialized professionals.

Piraputanga is diversifying its production: pisciculture, seed collection, beef and dairy cattle, subsistence agriculture, apiculture and Cerrado fruit pulp are the main activities. With this, family members who left the settlement during the hard times are already making plans to return. For this, says Luiz Carlos, it would be necessary to expand settlement activities. In this direction, the UFMT incubator has been

providing guidance to allow development of projects like ecological tourism and collection and processing of Cerrado fruits, such as cumbaru, babaçu and buriti. In spite of all this, the settlement has already been pressured by the expansion of soybeans in Diamantino, even within the family circle.

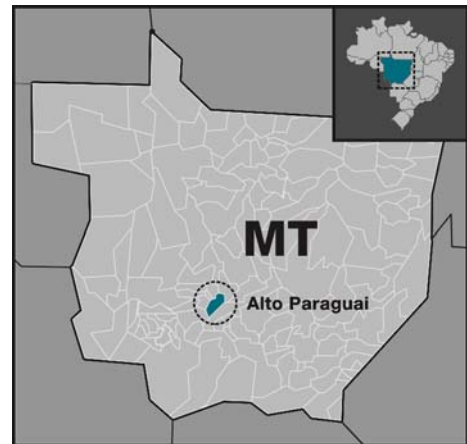
*“Even one of our cousins, who is studying Agronomy, lives in Nova Mutum and works for agribusiness, arrived talking about buying and leasing lands here in the back to plant soybeans. But my uncle and everyone else do not want to even think about soybeans around here. It has not been easy to resist. Income is limited, but it is better to live a healthy life on a limited income than be sick with a higher income, with contamination of poison.”*

## Alto Paraguai

Detached from Diamantino, the municipality of Alto Paraguai was created in 1953, originating from the discovery of new diamond and gold deposits in 1938. This new cycle lasted until the end of the 1960s. Then a new stage began, of mechanized mining.

The traditional miners then began selling their labor to the owners of the machinery. Use of equipment resulted in serious environmental damage. Enormous craters appeared in the mining areas, rivers were diverted, springs polluted and the water level contaminated.<sup>19</sup>

In 2007, a year after creation of the Environmental Protection Area in the sources of the Paraguay River, the National Department of Mineral Production (DNPM) closed down the mines. Today, the activity still occurs, on a smaller scale and, in general, clandestinely.



The reduction of mining had a strong impact on the economy of the municipality. Unlike what occurred in Diamantino, no other activities arose capable of generating income for the local population. Consequently, it fell from 14,679 to 10,476 inhabitants from 1993 to 2013, according to the IBGE. As we were told by Antonio Martins, who lives in Diamantino, there are no large farms or ranches in Alto Paraguai, nor companies. As a result, a large part of the current population works in the neighboring municipality.

*“In Diamantino, Alto Paraguai is seen by many people as a major source of cheap manpower for their activities. The people who came from mining, with little schooling, often go to work for Diamantino meat packing plants and farms. At harvest time, you arrive in Alto Paraguai and almost only see women. Perhaps because it is not yet pressured by agribusiness, the local government has a different perspective, more focused, on family farming.”*

## Family Farming

The decline of mining led to significant family farming. Today, more than 600 families live in the seven agrarian reform settlements in the municipality alone, according to the Ministry of Agrarian Development (MDA, 2010). Unlike what we see in Diamantino, these settlements, concentrated in the Capão Verde district, are located far from the large areas where soybeans are grown in Alto Paraguai.

José Antônio Mesquita, Head of the Cabinet of Alto Paraguai's Mayor's Office, another person we interviewed, says that agriculture is a priority for the municipal administration. According to him, the municipal government has strongly supported production of foodstuffs in the seven settlements existing there, encouraging its expansion and diversification, and has also been working to support commercialization of this production, by means of the National School Meal Program (PNAE) and the Food Purchase Program (PAA) of the federal government. Meeting local needs, as well as the proximity to Cuiabá (close to 130 kilometers away) ensure good conditions for sale of family production in the municipality. Support also includes stimulus for pisciculture. With this, still according to Mesquita, possibilities open up, contrary to what is seen in other municipalities, for the younger generations of residents in the settlements to remain there. And, in fact, many of those who have left in recent years are now coming back.



Our visit to the Capão Verde settlement confirmed this information. There, food production and commercialization has been progressing, with the support and permanent presence of the Mato Grosso Research, Assistance and Rural Extension Company (Empaer), which has an office within the settlement. According to Irapuan Rodrigues da Silva, head of the local office, EMPAER provides support to close to 460 farm families.

The appearance of new areas of soybean on the road between the municipal seat and the district of Capão Verde, where the great majority of the residents of the municipality live is already a source of concern for Irapuan and the farmers, who fear contamination of waters by pesticides and reduced volume and silting of the rivers, as has already occurred in areas where the largest soybean fields are found in the municipality.



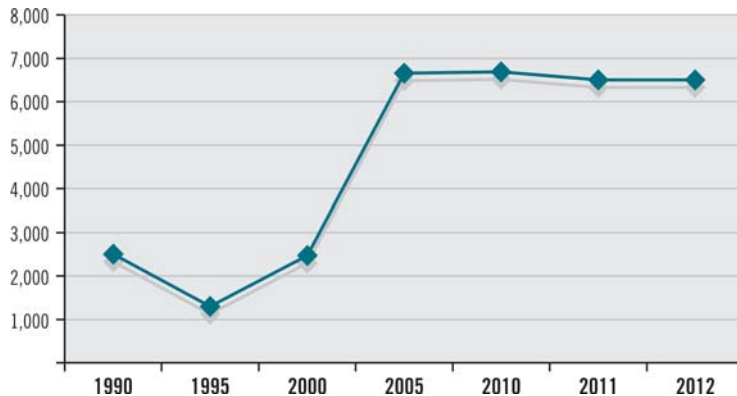
Soybeans on the edge of the road that connects Capão Verde to the Alto Paraguai municipal seat.



## Soybeans in Alto Paraguai

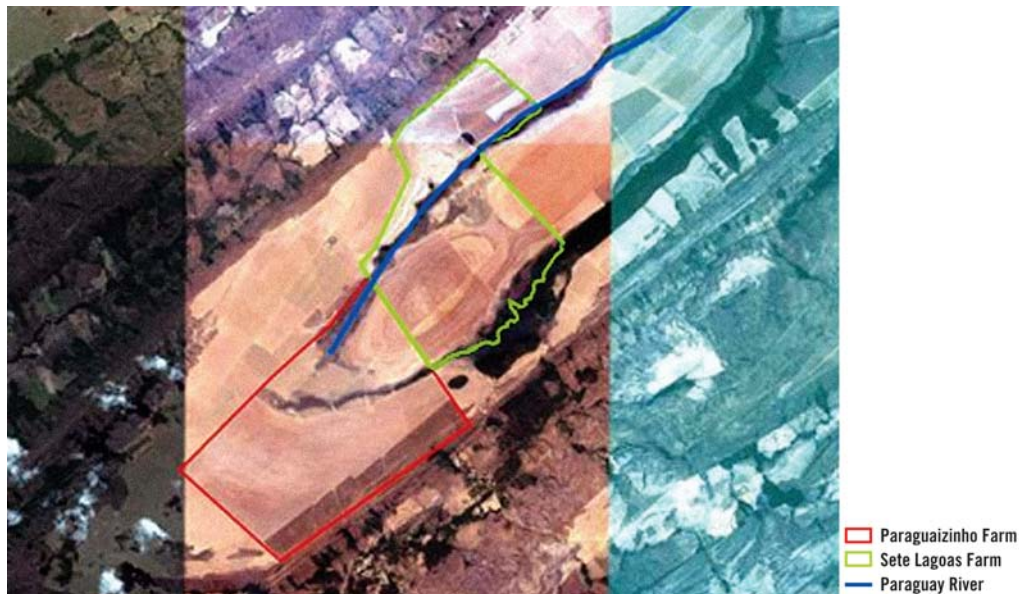
The official numbers confirm that, apart from being relatively small compared to other Mato Grosso municipalities, the area planted with soybeans in Alto Paraguai has not been expanding in recent years, and is around 6,500 hectares. The big problem is its location. It is in the region of the Paraguay River's headwaters that the three largest soybean and corn farms in the municipality are located. The Sete Lagoas and Paraguaizinho farms, operated by the El Tejar Argentine group, together occupy 3,900 hectares in that area.

### Soybeans in Alto Paraguai – hectares



Source: IBGE.

The Sete Lagoas farm owes its name to the existence, originally, of seven lagoons formed by the sources of the Paraguay River. Today, only four remain. The other three, surrounded up to their banks by pastures and soybean and corn fields, dried up as a consequence of deforestation. The Vanguarda Group, whose largest shareholder is Otaviano Pivetta, one of the largest producers of soybeans in Brazil, grows soybeans and corn on the Terra Mãe Farm, which extends over 3,200 hectares of the same region.



Satellite image showing the Paraguay River (blue line) in detail with its source located on the Paraguaizinho Farm (red line).

Source: NBL, 2011.

According to José Antônio Mesquita, there are no further opportunities for growth of monoculture in Alto Paraguai, due to the characteristics of its terrain and its soils, not appropriate for mechanized farming, and also because a large part of its territory falls within the Paraguay River Sources State Environmental Protection Area (APA) created in 2006 by the state government, which occupies a total area of 77,700 hectares, covering lands of Diamantino (29,591 ha) and Alto Paraguai (44,067 ha). The presence of activities

such as monoculture, ranching, mining and prospecting show, however, that creation of the APA did not bring effective results in terms of protecting the river's sources and its biodiversity. According to a document prepared by civil society organizations that organized the 1st Expedition to the Sources of the Paraguay River in 2010,

*"Despite the creation of an important initiative as a sign of concern with the headwaters, it has remained nothing more than an "initiative." No structure was created so that complementary actions could be taken, for example, zoning of the APA and creation of a management council, among others. The APA cannot only exist on paper, not implementing the APA is a threat to our river."<sup>20</sup>*



Princesa Lagoon, Sete Lagoas Farm, sources of the Paraguay River.



Sete Lagoas Farm. Headwaters of the Paraguay River surrounded by soybean fields.

<sup>20</sup> <http://www.jornaloeste.com.br/?pg=noticia&idn=15573>



# Pisciculture

In September 2013, the Ministry of Fisheries launched the Structural Project for the Alto Paraguai Fishing Production Chain, the third of this type in the country, which intends to involve fifteen municipalities in the region. In Alto Paraguai, construction of a laboratory for production of juvenile fish is planned, with capacity to produce five million per year.

The municipal government has been encouraging private companies to invest in pisciculture in Alto Paraguai. The largest project underway is Piscicultura Princesa, which plans to install 1,200 hectares of water surface, a feed plant, ice plant and packing plant. The breeding tanks are being constructed in the source area of the Paraguay River. The overall project should receive BNDES funding.<sup>21</sup> In addition, the state and municipal governments are providing all the necessary infrastructure, such as improvement of the road access and power supply. The Maeda group also intends to establish operations in the same area, building tanks that total 200 hectares.



Piscicultura Princesa tanks, in construction in the Paraguay River headwaters region.

In the opinion of the mayor of Alto Paraguai, fish breeding is an excellent opportunity for improving the income of family farmers. For the mayor, it will benefit close to 500 families and involve another one thousand in production and commercialization of fish.<sup>22</sup>

According to Leandro Wandscheer, former municipal secretary of Agriculture, who we interviewed, Piscicultura Princesa will pass 5 to 7 thousand liters through its tanks that will flow in that region from springs during drier periods. Thus, the increase in evaporation area and wastes generated by the hatcheries may seriously compromise the quantity and quality of waters coming from the springs.

Another source of concern is the way family farmers are expected to be involved in the production process, if we look at the model practiced by companies that operate in this segment. In the municipality of Sorriso, the largest soybean producer in the country, Delicious Fish is operating with 400 hectares of water surface. The complex includes a feed plant and a laboratory for genetic improvement and juvenile fish production. Most of the feed used to nourish the fish is prepared based on soybeans and corn grown in Sorriso.

The current production capacity is 5,200 tons of fish per year. The expansion plan, already underway, plans an integrated partnership with 100 producers who will receive juvenile fish and feed from the company. Technical assistance will be provided by the partner Genetic Fish. Thus, it replicates the integrated production model practices in a variety of productive chains, such as that of chicken, pigs, milk and tobacco, where the income of small producers, determined by the integrator company, is generally very low. In the case of milk, for example, Nilfo Wandscheer, who has been landless and is today a member of the Rural Workers Union of Lucas do Rio Verde, tells us: *“Today, there is a dairy here that buys milk from settlers at R\$ 0.55 per liter. They only process, package and sell for school meals at R\$ 1.65”* (Schlesinger, 2013). It can be expected that this same model will certainly be applied to fish production in Alto Paraguai.

<sup>21</sup> <http://www.vpg.arq.br/noticias.php?tag=projeto-piscicultura>

<sup>22</sup> <http://www.altoparaguai.mt.gov.br/alto-paraguai-tera-laboratorio-de-producao-de-alevinos/>



# Poconé and Cáceres: Gateways to the Pantanal

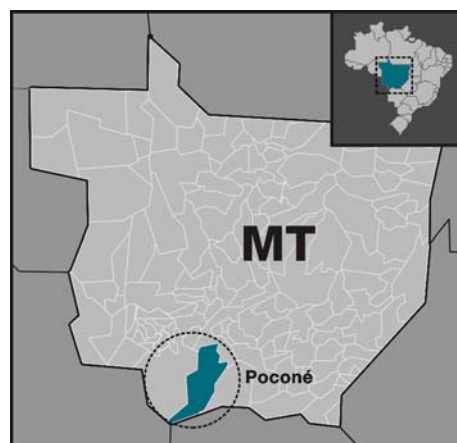


Close to 84% of Poconé's territory is located within the Pantanal biome, and 85% of Cáceres' (WWF, 2014). These areas, where cattle and mining have already left their marks, are now new agricultural frontiers for the expansion of soybeans, on the margins of swampy areas of the biome. Cheaper land than that located in the traditional planting regions is one of the attractions common to the two municipalities. Other reasons are analyzed below.

## Poconé

The settlement of Poconé was founded in 1778. Mining, soon followed by ranching, were the first activities practiced in the region. Cattle ranching grew almost continuously since then. With an estimated population of 32,000 inhabitants in 2013, the municipality has close to 400,000 head of cattle on its territory. Gateway to the Pantanal by means of the Transpantaneira highway, Poconé has tourism as another activity important to its economy.

Production of ethanol has also been a significant activity. The Álcool do Pantanal company (Alcopan) has, between its own property and leased land, 5,500 hectares planted with sugarcane. The plant, often caught subjecting employees to work conditions similar to those of slavery, was declared bankrupt in 2012, and is undergoing liquidation.



## The impact of mining in Poconé



Gold mining in Poconé

Starting at the end of the 1980s, gold mining underwent a new cycle, which has lasted until today, with mechanized mining by companies most prevalent. Contrary to what has occurred in neighboring municipalities, mining is still the main economic activity in Poconé today. According to the mayor, there are currently 14 large-scale gold mining operations and 200 “prospectors”, who engage in manual labor in the company mines. An average of 80 kilos of gold are extracted each month.<sup>23</sup>

Just as in various other regions, the activity is frequently practiced illegally, and government supervision is precarious. A report by the online Centro-Oeste Popular shows that the authorities have completely abandoned Poconé and the lack of government supervision has led many residents to digging holes in their backyards in search of gold.<sup>24</sup>

In any event, an operation undertaken by the Brazilian Institute for the Environment and Renewable Natural Resources (Ibama) at the end of 2013 closed several mines and apprehended equipment in the region. The operation, which also covered the municipality of Nossa Senhora do Livramento, caught miners who used mercury in the process.<sup>25</sup>

For Genério Rondon, Secretary of Rural and Urban Agricultural Development of Poconé, who we interviewed, mining is the most serious problem in Poconé, both from the environmental and health points of view, compromising the quality and availability of water. According to him, middle and upper class families in Poconé today drink only mineral water, while those less well off are exposed to mercury contamination when drinking water from the Bento Gomes and Piranema Rivers that supply the city. The Municipal Health Secretariat also has information on mercury contamination of the water table. In addition, silting of these rivers, caused primarily by mining activity, has been reducing the volume of their waters. During droughts, rationing of the water supplied to the population residing in the municipal seat has been occurring.

<sup>23</sup> [http://www.pmpocone.com.br/index.php?option=com\\_content&view=article&id=42&Itemid=10](http://www.pmpocone.com.br/index.php?option=com_content&view=article&id=42&Itemid=10).

<sup>24</sup> [http://www.copopular.com.br/cidades/id-89895/falta\\_de\\_fiscalizacao\\_incentiva\\_garimpo\\_ilegal\\_em\\_pocone](http://www.copopular.com.br/cidades/id-89895/falta_de_fiscalizacao_incentiva_garimpo_ilegal_em_pocone)

<sup>25</sup> <http://www.poconeonline.com/noticias.php?id=34967&>





Aerial view of Poconé and one of its mining areas.

Genério shows that the fight against illegality is impractical, to the extent that the State Secretariat of the Environment and Ibama are negligent and the political power of the mining companies impedes local government supervision. According to him, the former municipal secretary of the Environment, Urbano Ramos de Sene, was removed from the position as a result of political pressure:

*“He was performing this work when he was at the Secretariat, he was not issuing permits for the mines and notifying those that did not have them, some mines even had to close down. The director of the Secretariat of the Environment received death threats. Suddenly, the prospectors began to exert pressure. Politicians with a lot of power in the state of Mato Grosso have mines here”.*

## Soybeans in Poconé





According to Paulo Teixeira Jr., a professor at UFMT, the Cuiabana Lowlands, where Poconé is located, has been serving as a buffer zone: the environmental damage generated in the plateau is absorbed in this region, hitting the Pantanal with less intensity and allowing this ecosystem, despite the impacts it has already been suffering, to still remain relatively well preserved.<sup>26</sup> What can be anticipated is that now, in the Cuiabana Lowlands as well, intensive use of pesticides will increase contamination of the Pantanal waters.

The planting of soybeans in this lowland area and, especially, in the municipality of Poconé, has been encouraged by representatives of the sector. In March 2014, the Bom Futuro Group held the “Day of the Soybean Field in the Cuiabana Lowlands: Breaking Paradigms,” in Cuiabá. At this same event, the Imea presented a study showing that there are 586,000 hectares in some way appropriate for planting soybeans.<sup>27</sup> And Poconé was the municipality most mentioned in terms of potential for this crop.

From the point of view of the farmers that are planting soybeans in Poconé, the fertility of the land, low incidence of pests and easy distribution of production are factors that reduce the cost of production and transport. Degradation of the pasture areas, which reduces the productivity of cattle ranching, has also encouraged conversion to soybean production.

Data of the IBGE’s Municipal Agricultural Survey indicate that, until recently, soybeans were not cultivated in Poconé. In 2011, however, they began to be planted in small proportions. Paulo Gasparoto, a soybean producer in the municipality of Campo Verde, the first to cultivate soybeans in Poconé, started production on 200 hectares, which would grow five times larger by 2014. The area is located in the headwaters region of the Piranema stream that flows into the Bento Gomes River, the largest source of water for Poconé. The mayor estimates the extension of soybean fields in the municipality at close to 3,000 hectares in 2014.

Just like Gasparoto, other producers have begun and expanded cultivation in Poconé, using areas previously occupied by pasture. Traversing the municipality, guided by Genério Rondon, we saw that the areas previously occupied by sugarcane on areas that had been leased to Alcopan, are also being occupied by soybeans. There is concern about the areas owned by the company itself, which, available after the bankruptcy process is completed, may lead to a new cycle of soybean expansion.



Sugarcane area of Alcopan, now destined for soybeans.

<sup>26</sup> [http://www.ihuonline.unisinos.br/index.php?option=com\\_content&view=article&id=3542&secao=345](http://www.ihuonline.unisinos.br/index.php?option=com_content&view=article&id=3542&secao=345)

<sup>27</sup> <http://www.poconet.com.br/?pg=noticia&id=12580>

According to Genério, the growth of soybeans in Poconé is a reason for administration concern. In addition to the threats to the environment, there will be no benefit to the rural population because, at least for now, all labor is being brought from outside.

*“There was no concern with training local people. They bring employees from their farms in other locations: When I visited these farms, I saw that no one from Poconé is working there.”*

The fact that soybeans are being planted in pasture areas does not mean that no deforestation has occurred. Trees such as cumbaru, coconut, bocaiuva and others, which provide shade to animals, are preserved in the pastures. With the arrival of soybeans, all these trees are cut down. The collection of cumbaru nuts, for example, is an important activity for extractivist populations in the region and a frequent practice in these pasture areas. Many families that live in settlements in the municipality earn good income from this activity.

In the municipality, family food production has been growing and diversifying. The Mixed Cooperative of Rural Producers of Poconé (Comprup) and the associations of small producers, with support from the mayor’s office, already supply, through the PNAE, schools in other municipalities of the region, such as Cuiabá, Várzea Grande and Curvelândia.

In the Cuiabana Lowlands, the Mato Grosso Sustainable Agriculture Exchange Group (Gias) is also present. Comprup and Fase are part of the coordination for this state network that brings together family farm organizations in Mato Grosso, offering training activities and chances to share experience related to Agroecology. Gias promotes diversification of production, preservation of Cerrado fruit trees and traditional or creole seeds. It also created an exchange network, to ensure exchange of genetically-pure seeds, free of poisons, transgenic organisms and company monopolization.

It also emphasizes organic production of honey, brown sugar candy and molasses. With UFMT support, a program aimed at production, based on cultivation of medicinal herbs of the region as medicines to be provided free of charge to low income populations, is also being developed.

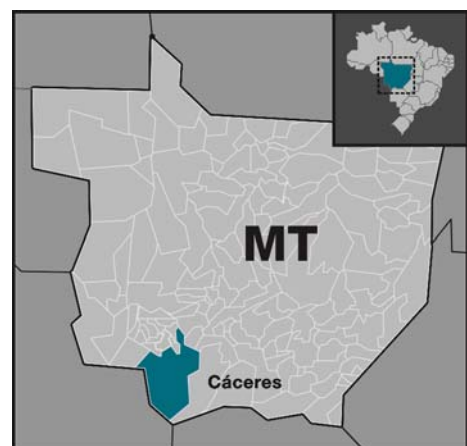
The expansion of soybeans in Poconé may compromise this entire production. Scarcity and contamination of the waters, just as cutting down of trees, are the main reasons for concern. Despite the concern, the local government does not have, today, legal instruments that would allow it to control this expansion, whose impacts will add to those caused by mining and ranching. The local government plans to create a Municipal Environmental Council and, with it, define a code of policies that would control soil use in the municipality.

## Cáceres

The settlement of Cáceres was founded in 1778. Just as in the other municipalities analyzed, gold and diamond mining was its first economic activity. The settlement was also motivated by the desire to protect the border between the lands of Portugal and Spain. The region was strategic for the defense and expansion of the southwest border of Mato Grosso due to the ease of communication between Vila Bela da Santíssima Trindade and Cuiabá, and with the captaincy of São Paulo, by means of the Paraguay River.

Since this time, cattle ranching performed a central role in the economy of Cáceres. Extraction of lumber, rubber and medicinal plants was also important. The establishment of the river port of Cáceres allowed the development of commerce and beef and sugarcane agricultural companies, with the exports of the Ressaca and Descalvados Farms’ sugar mills, still in the 19th century, standing out. The Descalvados Farm, based on ranching, exported beef broths, extracts and processed products (Dan, 2010).

Sugarcane activity began to decline in the 1940s, due to competition from mills in the Southeast of Brazil. With the construction of new highways in the 1950s and 1970s, the port of Cáceres lost its strategic position in the shipment of merchandise in the region. Over the same period, extractive activity gave way to diversified agriculture.





Ranching, however, remained the main economic activity. In May 2014, according to the IMEA, Cáceres had the largest cattle herd in the state, with close to one million head.<sup>28</sup> Related to cattle breeding, Cáceres also has meat packing plants, dairies, tanneries and leather goods manufacturers. The Coocrijapan company has three alligator farms, a meat packing plant and a tannery in the municipality. Tourism related to fishing and visits to the Pantanal are also important to the economy. Cáceres still has the largest area of teak planted in Mato Grosso, with 23,000 hectares.

Two other large enterprises are expected by the business community of the region. Construction and structuring of the Port of Morrinhos, tied to implementation of the Paraguay-Paraná waterway that we analyze below, and installation of the Cáceres Export Processing Zone (ZPE). Created by decree in 1990 and not yet executed, it is also associated with extension of the waterway to Cáceres.

## The Hydroelectric Power Plants on the Jauru River and Fishing

In Cáceres, we interviewed the president of the Z-02 Fisherman Colony, Elza Basto Pereira. Fishing, the most important economic activity of the low-income riverside population, in the municipality and in the region, has been suffering the impact of several enterprises. For Elza, the growth of soybeans is worrying. Currently, the movement of heavy machinery on Ressaca Farm lands, in the hands of Grendene, a traditional Rio Grande do Sul manufacturer of sandals, is the greatest reason for this concern, since the farm is located on the banks of the Paraguay River, and contamination by pesticides is more than likely. According to Elza, several riverside communities lived on this bank of the river. After purchase of the farm by Grendene, these populations were forced to move to the outskirts of the city, and today no one can enter the area: “Fishermen cannot even camp there any longer.”



Ressaca Farm

HUNTING AND FISHING PROHIBITED

Ressaca Farm, owned by Grendene.

Construction of hydroelectric power plant dams on the Jauru River, a tributary of the Paraguay River that flows through the region, has been causing major harm to the activity of fishermen. In addition to a medium-size plant, several small hydroelectric power plants (PCHs) have been built along the river. Elza, who has lived in Cáceres for more than 40 years, has been watching the strong decline in fishing there and in nearby municipalities also crossed by the Jauru River.

*“The Jauru River is over. Fisherman there are in bad shape. There are days when you can walk in the river and days when they release water and it rises two or three meters. When they close it, all the fish die, end up on the land. The fishermen there no longer even send me information on the number and quality of fish they catch, because there are no more fish. The fish are all crazy. Sometimes the river is full, sometimes it’s low. When it rises, the fish think it’s time to spawn. Then it drops again. It leaves them all disoriented.”*

<sup>28</sup> <http://www.diariodecaceres.com.br/exibir.php?noticia=8063>



Elza tells us that, with no survival alternatives, the fishermen are trying to obtain financing to develop a pisciculture project.

*“It is very difficult for people used to getting up in the morning, arranging their gear and heading to the river, it’s crazy to see nature decimated this way.”*

## Soybeans and the Waterway in Cáceres

The story of soybean planting in Cáceres is recent. Only starting in 2005 do IBGE statistics begin to show a significant planted area in the municipality: 3,000 hectares. The largest areas are located in the community of the Gleba São Luiz, in the Morraria region, and on the Morada do Sol farm, near the border with Bolivia. Close to 80% of the cultivated area is found on these two properties. The cultivation, in general, has occupied areas previously used for cattle ranching.<sup>29</sup>

The planting, however, has been growing in recent years, mainly in degraded pasture areas. One of the reasons for this is the value of land in Cáceres compared to the regions with the highest concentration of soybeans in the state. The average price per hectare in the municipality at the end of 2013 was close to R\$ 7,500, according to Neto Gouveia, secretary of Agriculture of Cáceres and vice president of Famato. On the other hand, in Sorriso, the largest producer of soybeans in the country, one hectare of land was sold for R\$ 30,000.<sup>30</sup>



Bom Tempo Farm in Cáceres

Expectations with regard to the Paraguay-Paraná waterway are another important factor of attraction. According to IMEA, the waterway should reduce, on average, the cost of soybean transport in the state by 25%. In Cáceres, this cost would be quite a bit lower than in other places.

Due to construction of the port, Grendene has already announced investments for cultivation of 1,000 hectares of grain for the 2014/2015 harvest. Another 4,000 hectares are expected to be cultivated in the following four years.<sup>31</sup> “The main reason is the city’s strategic position and construction of the Port of Morrinhos, which will be essential for the shipment of our products,” says Wilson Corrêa, director of Agriculture at Grendene, which hopes to produce 40,000 tons of soybeans in the next years. Grendene in-

<sup>29</sup> <http://www.noticiasagricolas.com.br/noticias/soja/37751-ibge-estima-aumento-do-plantio-de-soja-em-2009-em-caceres.html#.U4-3VvidWVM>

<sup>30</sup> <http://www.diariodecaceres.com.br/exibir.php?noticia=5262>

<sup>31</sup> <http://www.diariodecaceres.com.br/exibir.php?noticia=6620>

tends to invest in a large warehousing structure and in gradual growth of soybean planting. The group owns the Ressaca Farm, one of the first establishments in Cáceres, which has an area of 45,000 hectares on which beef cattle breeding predominates.

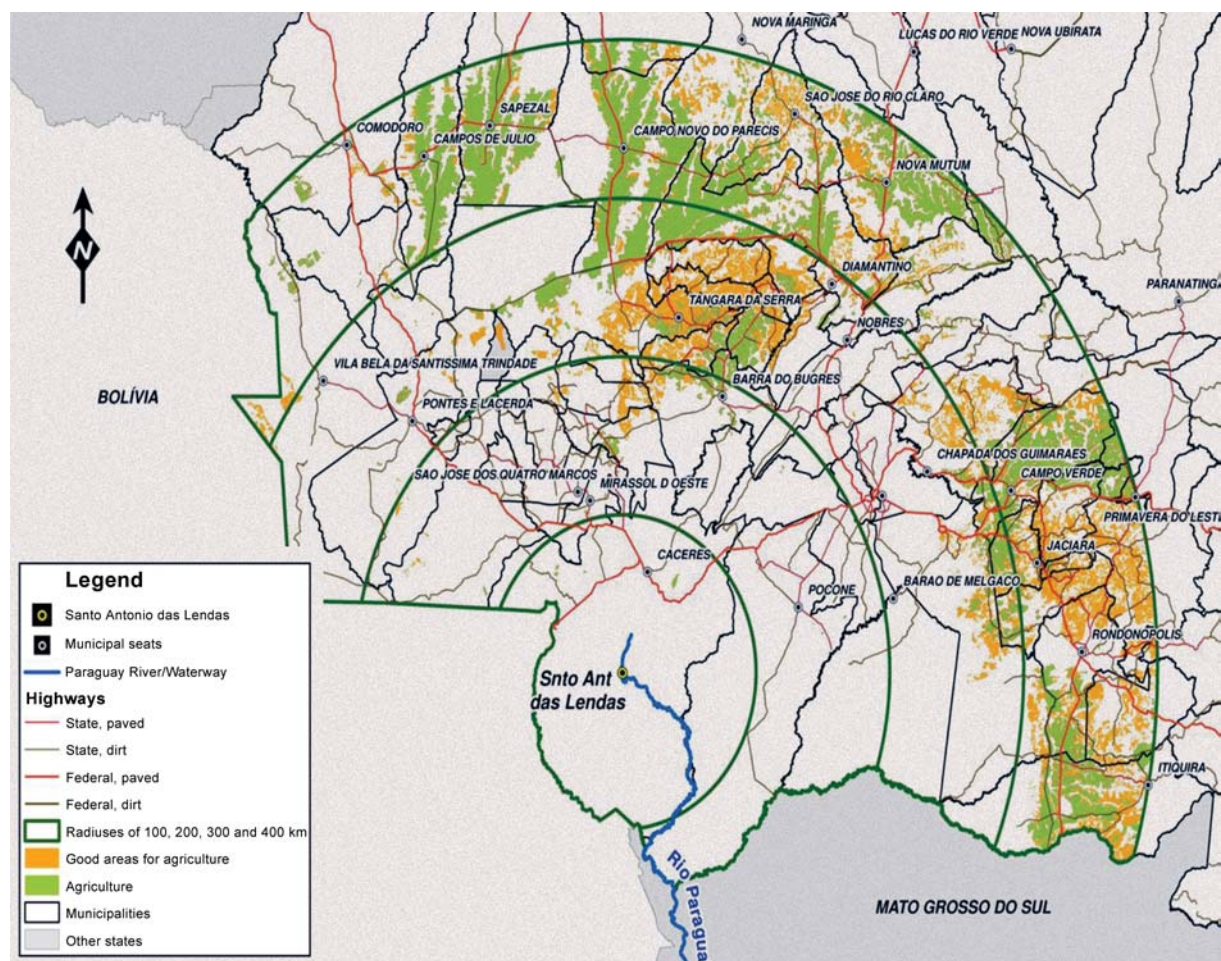
A 2013 technical report of the National Waterway Transport Agency (Antaq, 2013) predicts that by 2030 annual transport of grain from the region will reach close to 30 million tons. This projection confirms the expectations that soybeans, accounting for the highest volume of production in the surroundings, will be the main product shipped on the waterway, with more than half the total weight transported (51%). It will be followed by iron ore (24%) and corn (22%).

The schedule of the Ministry of Transportation (2013) plans for the waterway works in the stretch between Corumbá and Cáceres to be completed between 2021 and 2023. However, the business community involved in the production chain of grain in Brazil have been exerting pressure to finish the project earlier.

In May 2013, according to the Globo Rural magazine, dozens of producers from the municipalities of Diamantino, Sapezal, Campo Novo do Parecis, and Tangará da Serra, among others, left Diamantino in a caravan, for the purpose of applying pressure for expansion of the waterway. The expedition of the Pro-Logistics Movement, led by Aprosoja, evaluated the condition of the highways that connect Diamantino to Santo Antônio das Lendas, crossing the municipalities of Arenópolis, Denise, Barra do Bugres and Cáceres, all within the Upper Paraguay Basin, in order to identify the works needed to improve access to the new port.

*“According to studies by the Pro-Logistics Movement, use of the waterway could reduce this cost by as much as 34% in a radius of 400 kilometers, an area which encompasses several large producing municipalities and stimulate new agricultural frontiers, just as is already occurring in the west of the state, in municipalities like Pontes e Lacerda, Mirassol d’Oeste, Quatro Marcos and Araputanga, traditional bastions of dairy and beef ranching.”<sup>32</sup>*

## Paraguay-Paraná Waterway Area of Influence



Source: Pro-Logistics Movement, 2013.

<sup>32</sup> <http://revistagloborural.globo.com/Revista/Common/0,,EMI337157-18077,00-PRODUTORES+DE+MT+MAPEIAM+HIDROVIA+PARAGUAIPARANA+EM+BUSCA+DE+NOVA+ROTA.html>.

Completion of the Paraguay-Paraná waterway works will result in expansion of agriculture and ranching in its surroundings, as already announced by the president of Aprosoja. The characteristics of the region would be appropriate for adoption of soybean and corn crops, with a large presence of pasture areas favorable for cultivation of corn in rotation with cattle ranching, as would the proximity of the waterway and construction of the Cargo Transshipment Terminal in the region of the Santo Antônio das Lendas Farm. "The Jauru Valley region would be, more or less, between 200 and 3 00 kilometers from the beginning of the Ecovia (sic), and would be the area most benefitted by this production shipment route."<sup>33</sup>

For these reasons, it can be predicted that, with extension of the waterway to the Port of Morrinhos, it will not be just the expansion of soybeans and corn that will further impact the Upper Paraguay Basin. The complementary highway works, such as the opening, extension and paving of highways, the large movement of cargo and the growth of other related activities will certainly accelerate the process of occupying and destroying the Pantanal.

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**33** <http://www.aprosoja.com.br/noticia/presidente-da-aprosoja-apresenta-viabilidade-de-graos-no-vale-do-jauru/>



# The whole Pantanal, not just the half

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The results of this study illustrate the fact that the existence of the Pantanal depends on the integral preservation of the Upper Paraguay Basin. The state of conservation of the headwaters of the Paraguay River and its tributaries, in addition to the plant life in its surroundings, as well as the quality of its waters, are conditions essential for the preservation of the Pantanal and the rights of its inhabitants.

Although of recognized importance, the legislation in effect is far from ensuring preservation of the biome in the manner required. Reinforcing this panorama, the bills being considered with respect to use of the region contain provisions that would make the situation of the biome even weaker. Contributing to this worrying scenario is also the lack of supervision to ensure compliance with the law and lack of recognition of the need to consider the plateau region of the UPB an integral part of the life of the Pantanal.

Facing this scenario in which in the absence of social control mechanisms, large enterprises develop to the detriment of local populations and the environment, urgent action is needed to preserve the Pantanal and its people.

## Recommendations

At the end of our project a meeting was promoted on September 18, 2014 in the Cáceres city council chamber by civil society organizations of the region and the Mato Grosso Public Ministry. The event was also attended by various other civil society organizations of the region, universities, local governments, the city council and the Federal Public Ministry. In the meeting, the government representatives were asked for concrete and immediate measures to solve the problems presented.

Many of the following proposals and claims presented were prepared by local civil society organizations over the years of advocacy to preserve the UPB and improve the quality of life of its people. Others, resulting from observation of the issues treated in this study, are suggestions designed to contribute to the strengthening of actions. We limit these recommendations to the topics addressed in the study. We do not deal here with other sectors of activities that require attention, such as ranching, artificial forests, coal and steel production.

## Monocultures

- Establish a moratorium on planting of soybeans and other monocultures for the entire Upper Paraguay Basin, based on the same decree criteria that prohibit expansion of sugarcane in the basin.
- Require Sema and Ibama to supervise legal compliance and require owners of areas in the UPB to recover the legal reserve and permanent preservation areas of the sources over the entire length of the Paraguay River and its tributaries, for the purpose of revitalizing them and ensuring the survival of the populations that live on fishing and ecological tourism.
- Prohibit landfill of swampy and basin land in farm and pasture areas.

## Pesticides

- Prohibit aerial spraying of pesticides in order to protect inhabitants, their agricultural production and the water resources neighboring the monoculture and pasture areas. Likewise, forbid the use of pesticides prohibited in other countries for causing proven damage to health or the environment.
- Revoke Mato Grosso State Decree No. 1651 of March 11, 2013, in order to maintain MT State Decree No. 2283/2009 in effect, in order to reestablish minimum distances for spraying of pesticides in relation to settlements, cities, towns, neighborhoods, spring water, isolated residences, herds of animals and springs.

- Promote regulation and strict supervision of the sale and use of pesticides and transgenic seeds, in order to protect family farmland that adopts the transition cycle for ecological agriculture food production.
- Demand that systematic studies be conducted of the quality of river and well water in areas where pesticides and vinasse are used.
- Conduct studies on the incidence of diseases caused by exposure to pesticides, comparing the results obtained in these areas to those of others where monoculture is not present.
- Provide for indemnification of family farmers for losses caused by use of pesticides in neighboring areas, to be paid by those responsible for spraying.
- Prevent intimidation of communication and reporting of diseases caused by pesticides to workers and residents in the region, and of other illnesses resulting from exposure to risks in workplaces, particularly in areas of monoculture and meat packing plants. Demand indemnification of the respective victims.
- Conduct studies to determine the minimum allowed distances for disposal of vinasse used as fertilizer in areas where sugarcane is planted, especially protecting river headwaters and bays.
- Comply with the programs established to capture and treat sewage, preventing disposal of raw sewage in river and stream waters.

## Waterway

- Suspend construction of the Paraguay-Paraná waterway project. Seek new alternatives for transport of agricultural production from the Mid-Western region, which does not use the region of the basin as a route for cargo transport. Navigation in the UPB should be adapted to the natural conditions of its rivers and not the reverse.

## Hydroelectric Power Plants

- Do not grant new licenses for installation of hydroelectric power plants in the UPB.
- Establish operating rules for already existing plants, in order to minimize damage caused by operation of locks that cause rapid changes in river flow. Study measures to reduce fish mortality and other problems caused by activities in this sector.

## Mining

- Mining activities, licensed or not, should be subject to systematic supervision by the government.
- Ensure threatened and affected populations the right to direct consultation, approval and veto power over mining enterprises.
- Ensure the right to establish areas free of mining on family farmland, like those of traditional communities and settlements that demonstrate their production of diversified foodstuffs. Prevent the possibility of private sales for transferring land between settlers and mining companies without the approval of their community organizations.

## Family Farming

Family farming of food needs to be supported and encouraged, in order to supply local and regional markets and generate income for the various groups that make up the rural population of the region: land reform settlers, riverside fishermen, indigenous populations, traditional communities, gatherer populations and traditional farmers, who continue to raise cattle on native pastures, following the natural cycle of the Pantanal. For this the following actions, among others, will be necessary:

- Valuing organic products by preferential purchases through official food purchase programs.
- Establishment of state regulations that ensure compliance with official food purchase programs. Promotion of effective operation, in the region, of the existing official programs that encourage production and preferential purchase of family farming foods, such as the National Agroecology and Organic Production Plan (Planapo), the Food Purchase Program (PAA) and the National School Meal Program (PNAE).

- Support and promotion of public markets designed for direct sales by producers to consumers.
- Improved quality of access roads to distant locations where foods are produced, particularly the settlements, to make transport of the production feasible.
- Technical and financial support for self-processing of dairy, fruit pulp and other food production, whose processing adds value to family production.

## Fishing and Pisciculture

With the current scarcity of fish in the basin rivers, in addition to initiatives designed to recover the natural conditions of the waters, immediate measures to ensure the subsistence of populations that live on fishing or need it to complement their income are necessary.

- Provide financial resources and technical assistance to make small-scale pisciculture feasible on family properties. Technical assistance should include guidance necessary so that this activity does not compromise the quality and volume of river waters.
- Demand social and environmental planning of legislation on pisciculture activities. Today, in addition to the large companies that have been installed even in the sources of the Paraguay River, fish farmers who have up to five hectares of water surface in excavated tanks or reservoirs with up to 10,000 m<sup>3</sup> of water in tank networks are considered small scale and exempt from environmental licensing. Without sacrificing support for family production, it is necessary to provide for the impact of all these activities on the UPB.
- Simultaneously, it is necessary to revitalize the rivers in the region, with replanting of riparian forests with native fruit trees and repopulation of the waters with original species. These measures are also essential for maintenance of ecological tourism, an important source of income for part of the Pantanal population. It should be remembered, furthermore, that pisciculture uses feed based on soybeans and corn and, consequently, encourages the practice of monoculture.

## Other Necessary Measures

- Integrated zoning of all agricultural activities, which avoids the presence of monocultures in areas necessary for protection of the ecosystems and in regions strategically important for diversified food production.
- Articulate campaigns to protect the Upper Paraguay Basin at the regional, national and international levels. In this latter case, the possibility may be considered, for example, a proposal to suspend the purchase of soybeans coming from this region.
- Monitor the pending bills that may have impacts on the region, such as the new Mining Code, the State Zoning and the Law of the Pantanal.
- Support the suit by the State Public Ministry, which through the 2nd District Attorney of Diamantino, demands that the Mato Grosso government provide for effective implementation of the Permanent Preservation Area in the sources of the Paraguay River.
- Ensure that the local civil society organizations, in a coordinated manner, are present in state and national committees and councils whose resolutions may ensure rights and positively influence the living conditions of these populations and the environment.





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