

Large scale soy producers in Paraguay

Attitudes and behaviors towards sustainability



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Executive Summary

There are many reports that express concern about the current large scale production of soy in South America. Deforestation, contamination due to agro-chemicals and displacement of small farmers are all effects ascribed to soy production. Currently there are many smaller or larger efforts to increase sustainability, such as the Roundtable on Responsible Soy, or the implementation of a sustainable management system for farmers. Archer Daniels Midland (ADM) for example, aims to introduce Solidaridad's Rural Horizons, a system which will help producers gradually improve their sustainability. Most of the reports on soy are about the negative effects that smallholders experience. Agri-business is also often spoken to, but the soy producers themselves are not. The objective of this thesis is to give the soy producers a voice and to see whether there is a foundation for the implementation of Rural Horizons.

The central question in this thesis is what the attitudes of large scale soy producers towards sustainability are, and why. Twenty two of the large producers that supply soy to ADM were interviewed. The results reveal that the producers have no attitude towards sustainability, because they do not regard it any way. Economic sustainability is important, and only if environmental and social sustainability fit within their economic goals, then measures will be taken.

To analyze and explain the research results, institutional theory is used, as this theory examines how attitudes become norms. Mark Granovetter's theory of embeddedness, in which he argues that social structures must be considered when analyzing institutions, also plays an important role, as the influence of three actors – the governments, NGO's and agri-business – on the producers is examined.

Agri-business has the most influence on the producers. Profit maximization is their main interest, and this is defended by a (semi) scientific discourse which originates from the lobby organizations. The lobby organizations use the media to forward their discourse, but producers also hear these arguments every time an agricultural sales representative comes to visit, which is quite often. Due to the high level of corruption in the government, the main interest of the government and officials is personal gain. There is no policy stimulating (agricultural) sustainability. Due to the government absence in this regard, there is a large *indirect* effect on the producers, as the producers are operating in an institutional vacuum. If the government is not acting responsibly, why should they? Lastly, NGO's strive for more awareness concerning the situation of the smallholders and the environment. They work via the government and agri-business. In spite of the fact that agri-business does not stimulate the producers to be more sustainable, they do engage in projects with NGO's, such as Rural Horizons. It is important for multinational companies to maintain a sustainable image, as this is beneficial towards their profit maximization goals. As producers accept what agri-business says, the NGO strategy of working via actors such as agri-business or the government could be successful in promoting sustainability.

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List of acronyms

ABCD's	ADM, Bunge, Cargill and Louis Dreyfus
ADM	Archer Daniels Midland
APS	Asociación de productores de Soja Oleaginosas y Cereales del Paraguay
BASE-is	BASE Investigaciones Sociales
CAPECO	Cámara Paraguaya de Exportadores de Cereales y Oleaginosas
CAPPRO	Cámara Paraguaya de Procesadores de Cereales y Oleaginosas
DAP	Desarrollo Agrícola del Paraguay
FDA	Federal Drug Administration
INDERT	Instituto Nacional de Desarrollo Rural y de la Tierra
EIA	Environmental Impact Assessment
GM	Genetically Modified
GMO	Genetically Modified Organism
IMAGRO	Impuesto a la Renta de las Actividades Agropecuarias
IRAGRO	Impuesto a la Renta de las Actividades Agropecuarias
MAG	Ministerio de Agricultura y Ganadería
NGO	Non-governmental organization
RR	Roundup Ready
RTRS	Round Table on Responsible Soy
SEAM	Secretaría del Medio Ambiente
SENAVE	Servicio Nacional de Calidad y Sanidad Vegetal y de Semillas
UGP	Unión de Gremios de la Producción
USDA	United States Department of Agriculture
WWF	World Wildlife Fund

Introduction

A tremendous amount of soy is grown in South America. The protein rich legume is popular in diets for humans and animals alike, in almost all parts of the world. Among other things, a higher demand for meat by a wealthier middle class in Asia has spurred demand. There is a great deal of research on the production of soy in South America, most of which express concern about its sustainability. Produced on a large scale for export, on an increasing amount of land, soy production can cause deforestation, water pollution, soil degradation, loss of biodiversity, chemical-related health problems and may exacerbate existing land conflicts. There are several initiatives that address these concerns, such as the Round Table on Responsible Soy (RTRS), the Dutch Soy Coalition, and various other INGO's such as Solidaridad and companies such as Payco and Grupo DAP.

For Paraguay, soy production is a crucial source of income. It is the number one export product, making it the sixth largest producing country in the world. Academic literature and reports from NGO's are often critical about the large scale production of soy in Paraguay, and focus on the campesino¹ or smallholder perspective. This criticism and the general criticism on the effects of soy production has led to several initiatives in Paraguay to promote more sustainable soy production. One of these initiatives is launched by Archer Daniels Midland (ADM), a commodity trading company, and Solidaridad, an INGO striving for sustainable food production. ADM aims to implement a management system developed by Solidaridad, called Rural Horizons. Rural Horizons is a set of tools that helps farmers continually improve production in a sustainable fashion. Designed with the industry and based on the actual situation in the country, a proper implementation of this system could result in both improving sustainability and increasing production. The system benchmarks against certain good agricultural practices, national legislation or a certification scheme, and makes the producer aware of where he stands and what he needs to do (V. Laurens, interview, 27 January 2014).

For such a management system to be successful and for achieving more sustainable soy production in Paraguay, the role and perspective of producers and members of the industry is

¹ Campesino: peasant, smallholder, or *minifundista*. The word campesino is preferred because it is generally used in Paraguay, and because it indicates an ideological location with particular politics (Hetherington, 2009).

crucial. Who are the producers and what is their opinion on the problems related to soy? What choices do they have to make in the production fashion of soy and how they are influenced by other stakeholders? But most importantly: Is there a foundation for a Rural Horizon system? In other words: are they interested in producing more sustainably?

The role and position of large-scale soy producers in Paraguay can be researched in several ways. Attitudes of soy producers towards sustainability can be considered an institution, which is defined by Douglas North as ‘a norm of behavior that structures repeated human interaction’ (1989). Institutional theory as defined by Scott analyzes how norms develop in an existing institution, and how certain attitudes, for example, become the ground rules for social interaction (Scott, 2004). So institutional theory analyzes how the producer’s attitudes towards sustainability became norms, determining how they behave. It offers a proper theoretical instrument to analyze the case, and leads us to the central question in this research:

What are Paraguayan large scale soy producers’ attitudes and behaviors towards agricultural sustainability, and why?

Researching the positions of the producers and telling their side of the story is the main objective of this thesis, and is essential in understanding the issues at stake in contributing to sustainability in Paraguay. Especially since the producers are usually depicted in a very negative manner (For example: Howard, 2009; irishseedsavers.ie, 2006 and Datta & Carter, 2006). A better understanding of their position contributes to the rate of success of the Rural Horizon management system specifically, and a better understanding of the obstacles to sustainable soy-production generally.

Structure of the thesis

To answer the central question, an introduction of the issues related to soy production in Paraguay is given in the first chapter, as well as the geographical context of soy in the country. The importance of soy for Paraguay is explained, as is the soy value chain, and the revenue model for soy producers. The second chapter continues with the theoretical framework and methodology. Institutional theory and its relevance to this research will be described, as well as the operationalization of sustainability and the conceptual model. Based on the literature in the first chapter, the theoretical framework and the conceptual model, the research questions are then

stated, followed by an explanation of how the research was executed. In chapter three, the relevant actors are further introduced, along with their attitudes towards several issues in the debate on soy. Chapter four, five and six contain the research results, respectively introducing the soy producers, their attitudes towards sustainability and their behaviors towards sustainability. The attitudes are based on the opinions of the producers on major issues in the context of the soy debate, also clarifying the agri-business, government and NGO viewpoint. The behaviors are based on actions on the farm, such as adherence to laws. Chapter seven then attempts to explain the research results with the aid of institutional theory. Finally, the conclusion is stated based on the central question of this research.

Chapter 1. Theoretical background and geographical context of soy

In this chapter, after an introduction to Paraguay, a short overview of literature relating to soy in South America and sustainability is provided, especially focusing on issues that are relevant in Paraguay. The second part of the chapter gives more specific information on soy in Paraguay, such as its history and factors that explain the expansion, but also the value chain and revenue model for producers.

Paraguay

Paraguay is one of the two landlocked countries in South America, with the Paraguay River flowing through the center of the country from north to south and dividing it into east and west, and the Parana River to the south, along the Brazilian/Argentinian border. The Eastern part of the country is called the Oriental, and is very suited for agriculture. Due to the tropical climate and very fertile soil, five harvests are possible every two years (versus two in Europe). The Western part is called the Occidental, is semi-arid, and is known for its large cattle ranches. Geopolitically, it can be compared to Poland – also a country that has suffered from its bigger

Figure 1. Map of Paraguay. Source: pbs.com



neighbors, and not very powerful. In Paraguay, Guaraní, the indigenous language and culture, is still widely influential. Spanish and Guaraní are the country's official languages.

Paraguay still has a favorable economic growth rate, largely due to agricultural production. However, there is only a small percentage that actually enjoys this growth. With a Gini coefficient of 52.4 in 2010, the country has one of the most unequal income distributions in the world (WorldBank Databank, CIA Factbook).

Land distribution is also grossly unequal, with 80% of agricultural land being held by 1.6% of landowners (Guereña, 2013), amounting to a Gini coefficient for land distribution of 93 for 2008 (Agricultural Census in Galeano, 2012 and Guereña, 2013).

The high Gini coefficients are an indicator of the tensions between campesinos and large, mechanized producers. Small farms have difficulty competing. These tensions have led to violence from both sides (the big and small growers), and the subject of soy is incredibly sensitive in Paraguay (L. Morroni, personal communication, 12 March 2014).

Soy and sustainability in South America

The crop itself

Soy is a versatile crop, used for many different purposes. The oilseed produces more protein per hectare than other uses of land (www.nsruiuc.edu), making it a cheap source of protein. It is mainly used as feed for chickens and pork in Europe and Asia. A second large application is biofuel. It is also used for human consumption, as processed food is often made using soy oil. Lastly, it is used by the chemical industry to make a variety of bio-based products (Bindraban et.al. 2009), including plastics, lubricants and solvents (www.nsruiuc.edu). In the 2012/13 harvesting season, 283.87 million metric tons were harvested in the world, with the United States, Brazil and Argentina accounting for more than 80% of production. Paraguay is the sixth largest producer, with a mere 2% of world production (USDA, 2014).

There is a global discussion on the production of soy, especially concerning the sustainability of genetically modified (GM) soy and of large scale production. 95% all soy grown in Paraguay is genetically modified (Guereña, 2013) and most is grown on a large scale, so this is a very relevant discussion. Unfortunately, scientists are still much divided on both subjects.

Genetically modified soy and agro-chemical use

GM soy is genetically modified to tolerate the herbicide Roundup, which is based on glyphosate. The transgenic modification allows the field to be sprayed with glyphosate, killing all plants except the genetically modified organisms (hence the nickname, *mata todo*). It was first

commercialized in the United States in 1996 (Antoniou et.al, 2010), and was legalized in Argentina in 1996 (Goldfarb and Zoomers, 2013), and in Paraguay and Brazil in 2005 (Shurtleff and Aoyagi, 2009). Using GMO soy was popular due to *'the compatibility with no-tilling systems, easy field operations and the simplicity of weed management'* and not because of higher yields (Benbrooke in Goldfarb and Zoomers, 2013).

Paul Collier calls the specifically European hesitance towards genetically modified crops *'romanticized populism'*. According to him, the European ban was a political decision, fed by the fact that American companies dominated research towards genetic modification. The big advantage of GMO is that it raises production, which is especially necessary in Africa. GM soy achieves this by resistance to certain beetles and herbicides. A biological revolution is necessary to stop the current stagnation in production, and keep it alongside the population growth on the continent. Another advantage of GMO would be price reductions of food (Collier, 2008).

Plant Research Wageningen released a report by Bindraban et.al. which concludes that problems with GM soy are not due to GM in itself, but concentrate on how it is used: *'the scale or type of cultivation practices (i.e. monocropping, large scale cultivation, tillage practices) and the expansion of soy production into areas which are environmentally sensitive or rich in biodiversity.... are very relevant for the discussion'*. According to their research, GM soy tended to use more herbicide than conventional soy due to weed resistance, and the discussion on the sustainability of GM soy should focus on herbicide use and the detrimental effects for the environment (Bindraban et.al, 2009).

Antoniou, Brack, Carrasco et.al. summarized research which proved the unsustainability of producing genetically modified soy (2010). First of all, there are no economic benefits for farmers, especially since weed resistance has become so high. While Bindraban's report concludes that there are no yield differences between conventional and modified soy, Antoniou et.al. speak of the *'consistently low yields'* due to glyphosate, which interferes with nutrient uptake, reduces vigor and yield, and increases pests and diseases. The report also connects the global rising demand for soy with socio-economic problems in South America, and environmental problems related to the use of glyphosate. Lastly, the report also mentions the fact

that the FDA has never officially approved GMO foods as safe for consumption. There are findings that suggest that modified soy may impact human health (Antoniou, Brack, Carrasco et.al, 2010).

In Argentina, the application of glyphosate to GM soybean fields increased from 1,000,000 to 160,000,000 liters in 8 years. Continual use has increased weed resistance, which means a further increase in the use of glyphosate, accompanied by other, more toxic herbicides such as 2,4-D (Altieri, 2009). Besides weed resistance and environmental damages, glyphosate has also been linked to human health issues. In the general context of agro-chemicals, Samsel and Seneff (2013) discuss the toxicity of glyphosate. They conclude that glyphosate is not without dangers, to both the environment and humans, and is thus not as benign as assumed. The enzymes in glyphosate disrupt the gut bacteria, and the long term consequences include gastrointestinal disorders, obesity, diabetes, heart disease, depression, autism, infertility, cancer and Alzheimer's disease (Samsel and Seneff, 2013).

Large scale agriculture

Developing countries often have a dual agricultural system, in which small subsistence farmers and very modern farmers coexist. The latter makes use of modern high capacity machines while small farmers do most by hand. The small farmers are generally more informal, make use of unskilled labor, have a low level of utilization of capital and technology and difficult access to markets. The large scale farmers embody the modern sector, with intensive use of natural resources, capital and technology (Borda and Caballero, 2013).

Large scale agriculture is often promoted as the way to develop, especially through exports. Advocates emphasize the macroeconomic benefits, including increased foreign-exchange earnings, diversified exports, and more efficient use of resources. Furthermore, improvements in productivity and employment are viewed as positive spill-overs of the challenges of producing labor-intensive crops for internationally competitive markets (Carter, 1996). Another argument in favor of large scale agriculture concerns food security. By 2050, the estimated world population will be 9 billion, and studies suggest that 70 to 100% more food will be needed by then (Godfray et.al., 2010). To be able to produce this, agriculture needs to intensify, as Tiftonell

also indicated. To be able to intensify, farmers need access to technology, knowledge and skills, capital to invest in higher production (such as irrigation, machinery etc.) and crop varieties that maximize yields (Godfray et.al., 2010). Besides the fact that large scale farmers generally have more access to these things, they are better suited to cope with investment, marketing chains, and regulation. Commercial agriculture is the best way of making innovation quicker and easier, and ignoring it as a force for rural development is seen as an ideological misconception by some (such as Collier, 2008).

Yet there are many arguments against large scale production. The scope and duration of the macroeconomic benefits are questioned, and declining terms of trade, short product booms, and increased dependency on food imports are pointed to. The rural poor experience less access to land, insufficient and uncertain labor opportunities, and rising food prices. Also, environmental degradation may result from intensified use of modern production inputs and low levels of regulation (Carter, 1996). Guareña and Burgos argue that governments should ‘shift their focus from attracting corporate investment to tackling the structural exclusion of smallholders, who are the main investors in agriculture’ (2014). A 2011 World Bank report argued that large-scale land acquisition can reduce poverty through three main mechanisms: the generation of employment for wage workers, new opportunities for contract farmers, and payments for the lease or purchase of land. A precondition is good governance (Deininger et.al., 2011 in Li, 2011). Li argues against these three mechanisms, firstly by using a table in the report itself, which among others shows that the number of jobs 1000 hectares of soy generates is 18 (Li 2011). Other estimates are lower, with one employee for every 170-200 hectares of soy (WWF, 2006). A small farm of 30 hectares easily employs 4-5, usually family members (Rojas, 12-02-2014). So there are few opportunities for new employment or contract work, even though harvesting season does create a few extra jobs. Lastly, the payments for lease or purchase of land are rarely market value, and the small farmers are not fairly compensated (Li, 2011).

Land distribution in Paraguay

Large farms may be more efficient and good for the macro economy, but currently the positive effects for rural development are debated, also in Paraguay. The agricultural export boom in the

1990's created an exclusionary society, first of all due to the nature of the crops: as mentioned above, not much labor is needed. A second reason is related to the land market (Carter, 1996) in Paraguay. In a country in which agriculture is so important, land is obviously an important asset. As previously mentioned, however, the land distribution in Paraguay is notoriously unequal, with 80% of agricultural land being held by 1.6% of landowners (Guereña, 2013). A short history of the land distribution is given below, based on an article by Kleinpenning & Zoomers (1991).

In 1883, 13 years after the devastating Triple Alliance war against Uruguay, Brazil and Argentina, the government started selling off large tracts of land, in order to pay debts. Foreign investors and politicians became the owners, creating a new, landed elite. However, the majority of the people had lost possession of their land under the first national ruler, Jose Gaspar Rodriguez de Francia, who had nationalized almost all territory. They were not able to buy these large tracts of land or even property rights and became (or remained) 'illegal' occupiers or renters. Some were driven from their land. At this time, most of the population lived near the Asuncion area, or the Central region (Kleinpenning & Zoomers, 1991).

In 1954, Stroessner came into power. During his rule, an important tool in preventing rebellion was agricultural colonization of the eastern parts of the country, which would increase the overall level of agricultural production, and improve the situation of the many smallholders living in the Central region. Farmers were allotted plots of twenty hectares, too large to use effectively (Carter, 1996). Agricultural production increased, but many small farmers were still not able to improve their lifestyle or to obtain the property titles (Kleinpenning & Zoomers, 1991) – and now risk being forced off their land once again.

The increase in agricultural production in the Eastern areas was thus not due to the smaller farmers. Foreign colonists and agricultural enterprises specializing in large-scale farming and cattle ranching also settled in the pioneer areas. Apart from a small number of large European and American firms, especially Brazilians became pioneers in Paraguay's eastern border zone. Because of their contribution to agricultural production and the growth of the national economy, the elite of foreign colonists enjoyed the active and passive support of the Paraguayan government. So while presented as a policy to improve the situation of the rural poor, the colonization strengthened the position of the land holding elite (Kleinpenning & Zoomers, 1991).

Campesinos

Globally, most farmers are small-scale producers, providing more than 80% of the food consumed in a large part of the developing world. In Latin America and the Caribbean, 15 million small-scale farms are essential for the economies and food security of the region, as well as for the future of 62 million people who still live in poverty in its rural areas. Paradoxically, it is these very same small-scale producers who are the most food-insecure (Guareña & Burgos, 2014).

Carter writes: *‘To summarize, a microeconomic reality of unequal capital constraints differentiated by size underlies the exclusionary and socially problematic export boom occurring in Paraguay’* (1996). Social impacts include displacement, loss of livelihoods, increased rural conflict, and loss of food security and sovereignty (Mora, 2006 in Garcia-Lopez, 2010). While traditional *latifundia* were the original focus of foreign investments, now campesino or Indian land is often purchased (Galeano, 2012). Smallholders are outcompeted or sell out, and find it increasingly difficult to find employment in rural areas (Carter, 1996). The conflict goes further than land rights or unequal opportunities. There are conflicts that involve entire communities reacting to the consequences of land purchases. While cohesion in these communities was strong, it is now rapidly declining due to these different consequences; this also explains some communities’ reactions (Galeano, 2012).

Deforestation

Global food and biofuel demand have pushed deforestation in South America (Grau, 2008). In Paraguay, the agricultural colonization policy also played a major role. Deforestation was stimulated, as it would develop the country. The forest in Paraguay was officially seen as an unproductive area until 2001 (Dutch Soy Coalition, 2009). The Atlantic Forest is in the east of Paraguay, in the agricultural colonization and soy producing areas. A Landsat analysis showed that this forest experienced the most forest loss, with a 73.4% forest cover in the 1970s decreasing to 40.7% by the 1990s and further down to 24.9% by the 2000s (Huang et.al. 2009).

However, globally, Grau writes that there is a contrasting trend, which is reducing deforestation rates in developing countries: *‘high yields in modern agricultural systems and rural–urban migration coupled with remittances promote the abandonment of marginal agricultural lands, thus favoring ecosystem recovery on mountains, deserts, and areas of poor soils, while improving human well-being’* (2008). This was seen in Mato Grosso, Brazil, for example, where deforestation decreased to 30% of its historical average (1996–2005) whereas agricultural production reached an all-time high.

Other scientists warn for the temporary effect of this increased production. The yield gap between South America and the United States is closing, meaning that the *‘the potential gain from ‘catching up’ is reduced’*, and that benefits of intensification are probably temporary (Boucher, 2011 and Licker et.al, 2010, in Elgert, 2012).

Besides higher yields, this was partially due to the fact that soy production is moved onto previously cleared lands (Macedo et.al., 2011). This is also the case in Paraguay, as most deforestation occurred in a period in which soy production was relatively stable. This could mean that the beef industry, for example, played a larger role in deforestation (Fundacion Moises Bertoni, 2007 and Maeyens et.al., 2007 in Gijssenburgh, 2014). The indirect role of the soy industry in deforestation cannot be denied however, as soy production moved onto land previously used for raising beef, which pushed the cattle sector to new areas in northern Paraguay, or the Chaco, where deforestation is now among the highest in the world (Hansen et.al, 2013). So deforestation is displaced, to new areas and to new sectors (Elgert, 2012).

Geographical context of soy in Paraguay

In this section, the context of soy in Paraguay is described. The history of soy is explained to further understand the current situation, after which the importance of soy for the country, where it is grown, how it works and the value chain are described. From the introduction, it has already become clear that Paraguay is an agricultural society – 80% of its exports are agricultural products. It is thus highly dependent on its agricultural sector. The country currently has a very favorable growth rate; in 2013, the GDP growth rate was 14.1%. Compared to a 2.2% growth rate in Brazil, this is an impressive figure.

History of soy in Paraguay

Paraguay is the sixth largest producer and the fourth largest exporter of soy in the world. Today, approximately 80% of *cultivated* land in Paraguay is occupied by the soybean (Guereña, 2013). In 2000, the area of land with soy was 1.2 million hectares (Reporter Brasil and BASE-is, 2010), in 2014 this is expected to be 3.2 million (CAPPRO).

In Latin America, soybeans were first cultivated in Brazil, in 1882. Paraguay followed in 1921, when Prof. Dr. Pedro Cianco introduced the legume. Already in 1941, in *El Pais*, the Paraguayan recommended the production of soy on a large scale, as he believed it was the most important food plant in the world. In 1951, he published '*The soybean and Paraguay's nutritional problem*', a 500 page ode to the nutritional merits of soy. He is considered the apostle of soybean cultivation in Paraguay (Alvarez-Britos in Shurtleff and Aoyagi, 2009), and introduced several varieties. Japanese colonists also grew the plant, to fulfill in their dietary needs. (Volorous, 1957 in Shurtleff and Aoyagi, 2009).

The harvested area grew quickly. In 1936, there were 161 hectares of soy (Oleagineux, 1962 in Shurtleff and Aoyagi, 2009). In 1960 1,000 hectares were harvested, (FAO, 1963 in Shurtleff and Aoyagi, 2009); by 1978, a U.S. Department of Agriculture publication first called Brazil, Argentina, and Paraguay the 'major U.S. soybean competitors' (Hamby, 1978, and Schroeder, 1978 in Shurtleff and Aoyagi, 2009). After the farmers had been importing the seeds as contraband for years (in some areas, as much as 90%), Brazil temporarily legalized GMO seeds in 2004, and then both Brazil and Paraguay legalized the seeds in 2005 (Thompson, 2004 and Reuters, 2005 in Shurtleff and Aoyagi, 2009). Both countries did so under large pressure from Monsanto.

Factors explaining the expanding cultivation of soy

The increasing production of soy is a good example of globalization. Policies in Europe or the USA have a direct influence on how much soy is produced. The demand side will be analyzed first, followed by reasons for an expanding supply.

In 1962, the United States and the European Community negotiated a zero level tariff binding on oilseeds, oilseed products and nongrain feed ingredients imported into Europe from the United States (McCalla and Josling in Ames et.al 1996). Later, the Blair House agreement restricted

European oilseed production, limited subsidies on production and established a ceiling on the total volume produced, far below European consumption. Both agreements influenced prices and increased dependence on the import of vegetable oils and protein, which increasingly come from South America and less so from the United States (Dutch Soy Coalition in Guareña, 2013). The elimination of import tariffs also meant that soy produced in South America was more competitive than that produced in Europe (Guareña, 2013).

In the 1990's, Europe had many problems with 'mad cow' disease, which was supposedly due to the use of animal bones in fodder. When this kind of protein was replaced with vegetable protein from soy, European demand for the legume sky-rocketed (Guareña, 2013).

A more recent reason for the increasing demand for South American soy is due to the EU Biofuel Directive (2003/30/EC) which promotes the use of biofuels for transport (Goldfarb and Zoomers, 2013), along with American demand for biofuels. There has been a wave of investments in Latin America to enhance biofuel production. Brazil and Argentina have a successful history of making, using and exporting biofuel (made from corn or sugarcane, for example) and biodiesel (from palmoil or soy, for example) (Rutz et.al. in Janssen and Rutz, 2011). Paraguay passed Act 2748 for Biofuels promotion in 2005, but is currently not exporting. Production of biodiesel, which is done by Petropar, has risen from nothing in 2011-12 to 14 million liters in 2013 (Joseph, 2013).

A fourth reason for the expansion of soy in South American is the unprecedented demand from Asia; a wealthier middle class consumes more meat and has created a bigger, more sophisticated livestock feed industry. While China was nearly self-sufficient in soybean production in 1995, ten years later China passed the E.U. to become the world's leading importer with 23.2 million tons (McKee, 2005). However, Paraguay is one of the few countries in the world that recognizes Taiwan. This means that officially, there are no Paraguayan exports to China, so Paraguay only profits indirectly from Chinese demand.

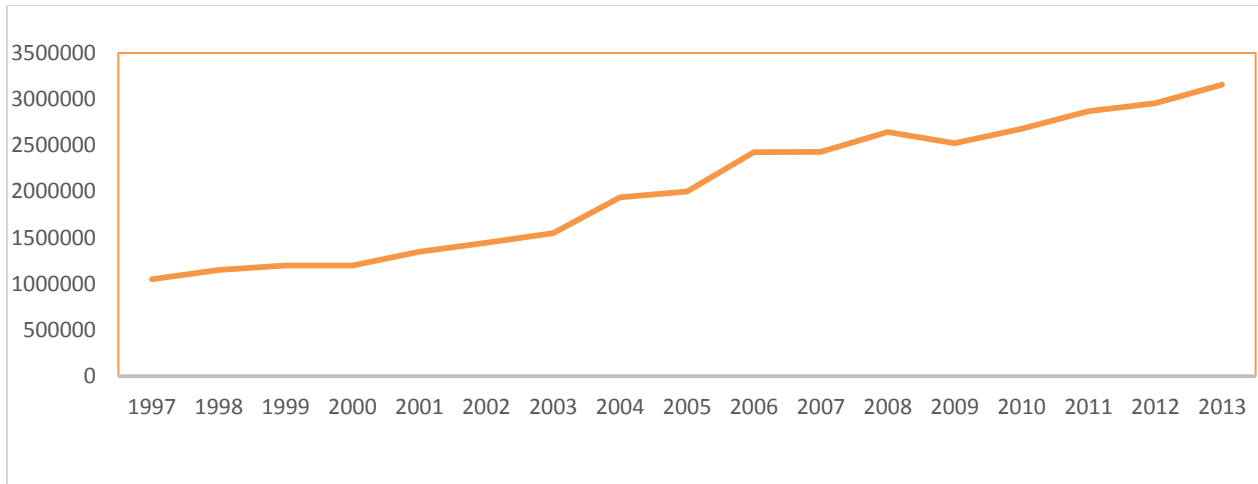


Figure 2. Growth of area cultivated with soy in Paraguay, in millions of hectares. Source: CAPECO

Stroessner’s policy of agricultural colonization (and thus deforestation) made land and cheap labor available, so farmers in Paraguay could meet the demand. The territorial expansion was accompanied by roads (into the forest), which is also almost directly linked to an increase in cultivated areas (analyzed for Brazil by Walker et.al. 2009 and Jepson et.al. 2010, among others).

The increasing demand for soy has been accompanied by technological innovation. In 2005, Paraguay legalized GMO. The graph above shows a steep incline of production in that year: the area cultivated went from 2 million hectares to 2.426 million (CAPECO), a 21.3% increase. In the 1990’s, zero or conservation tillage was introduced in Paraguay, which is currently used on 60% of cropland in Paraguay (Derpsch, year unknown). The RR soy makes the use of zero tillage systems easier as there is less need for weed control. Soy has appeared to be very suitable to conservation or zero-tillage systems, and the adoption of RR soy has been linked to the increased use of zero-tillage systems (Bindraban et.al. 2009) and vice versa: zero-tillage has been linked to the increased production of GM soy (Goldfarb and Zoomers, 2013). Technology has also made soy production possible in areas that were previously rendered unsuitable. Goldfarb and Zoomers write that ‘technological innovation is a key factor in the advance of the agricultural frontier’ (2013). Soy has advanced into the Argentinian Chaco, but it may take longer to reach the Paraguayan Chaco, as there is a lack of infrastructure.

Besides demand and the technology that makes the cultivation possible, foreign investment in Paraguay has greatly increased the supply side. Over the years some 450,000 Brasiguayos

(Brazilian farmers and their Paraguayan-born descendants) have immigrated to Paraguay. Living near the border, they have brought new agricultural techniques and made new investments in soybeans. According an article in the New York Times, this was crucial in Paraguay becoming the world's fourth largest soy exporter and a major producer of beef. Brazil is by far the leading source of foreign investment in Paraguay (Smith, 2003). The impact of international capital that multinational companies bring with them is also not to be underestimated. Companies like ADM, Bunge, Cargill and Louis Dreyfus dominate soybean trading and crushing and have built their own infrastructures (McKee, 2005).

The most important determinant of supply remains the price. Between 2003 and 2004, cultivated area increased by 24.9%, because of the good results in 2003. There were high yields (average of 2.9 tons per hectare, CAPECO), but also high prices. In 2004, the prices remained high, but because the yield in Paraguay was much lower: an average of just over 2 tons per hectare (CAPECO).

Richards et.al. also name the devaluation of foreign currencies against the dollar in the 1990's and early 2000's as a driver of soy production. The impact of currency devaluations in the 1990's on area of production was estimated for Bolivia, Paraguay and Brazil, and amounted to 80,000 hectares, or 31% of the current extent of soybean production. So, even when international soy prices were falling, farmers in these countries were benefitting from the devaluations (Richards et.al. 2012).

How important is soy?

Agriculture, of which soy makes up a large part, is the basis of Paraguay's economy. Soybeans constitute 40% of Paraguay's total exports, soybean meal 6.5% and soybean oil 4.7% (<http://atlas.media.mit.edu/profile/country/pry/>), meaning that soy and its byproducts make up more than 50% of the country's exports. Agriculture thus accounts for a large percentage of GDP, ranging from 23.55% in 2008 to 17.4% in 2012 (WorldBank Databank). Soy accounted for an average of almost 8% of GDP between 2008 and 2013 (Guareña 2013). Table 1 clearly illustrates the dependence on agriculture. In 2009 and 2012, there was a bad harvest – resulting in negative growth. The indicator 'Agriculture, value added as percentage of annual growth' demonstrates the correlation between annual GDP growth and the agricultural sector, and in this case shows that the negative growth is largely caused by agriculture.

Table 1. GDP growth and the influence of agriculture in Paraguay. Source: WorldBank Databank

	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012
GDP growth (annual %)	4,32	4,06	2,13	4,81	5,42	6,36	-3,97	13,09	4,34	-1,21
Agriculture, value added (% of GDP)	18,28	20,38	19,56	19,09	21,23	23,55	18,92	22,53	21,42	17,36
Agriculture, value added (annual % growth)	8,03	3,90	-0,12	3,61	14,34	9,18	-17,31	34,24	3,74	-20,06

In 2012, agriculture employed 30% of the population (WorldBank Databank), but, as mentioned, large scale soy plantations do not need many employees. Soybean export revenues could help develop the country, and have had a positive impact on other sectors, such as finance, building and commercial (D'Angelo, 2012).

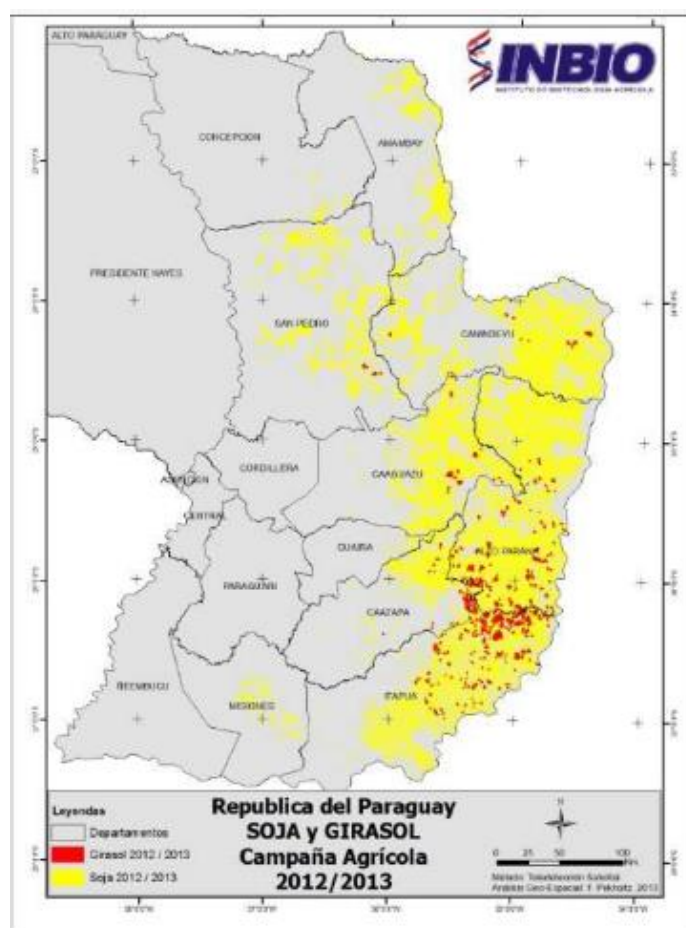
Figure 3. Location of soy in Paraguay. Source: CAPECO

Where is soy grown?

Soy was initially grown in the border provinces of Alto Paraná and Itapúa, where the land is most fertile (Guereña, 2013). The map on the right from CAPECO shows the 2012/2013 soy (and sunflower) harvest. It is grown in the Eastern departments, especially in Canindeyú, Alto Parana and Itapúa; which all border Brazil; and in San Pedro, Caaguazú and Caazapá. The yield differs per region. Some estimates given by ADM staff: 2.8 tons in San Pedro, 3.5 tons in Caaguazú and Alto Parana, 4 tons in Itapúa.

How does it work?

Soy is planted in September/October and harvested in January/ February. It can also be planted out of season, in January/ February and



then harvested in May. The out of season soy is called *soja zafriña*, and is often used to produce seeds for the next crop. To protect the soil, every producer rotates crops. Which crops depend on regional weather and price, but a typical rotation is as follows: soy – corn – wheat. Variations include chia, oats and rapeseed. As each plant extracts and adds different nutrients to the ground, rotation is essential. However, many grew *soja zafriña*, meaning that the rotation would be soy – soy – wheat, for example. There are five harvests every two years.

Revenue model

In this section, an estimation of the costs and benefits of a producer with 1.000 hectares of soy is given. First of all, a hectare of soy costs approximately 500 US Dollars to plant, see Annex 3 for details. Approximately, because only a handful of producers record their input costs, which include seeds, fertilizers, pesticides, etc. One employee for every 200 hectares, at minimum salary of 420 dollars a month means an extra cost of \$2.10 per hectare.

After the 2014 January harvest, the Chicago soy price was approximately 500 dollars per ton. However, the producer must subtract processing costs, documentation and transport from the silos to the sea harbor, which is paid to ADM (or another trader). 400 dollars per ton remains.

The yield differs per region. Some estimates given by ADM staff: 2.8 tons in San Pedro, 3.5 tons in Caaguazú and Alto Parana, 4 tons in Itapúa. As everywhere, land prices are dependent on the soil quality. If a producer in San Pedro receives 400 dollars per ton from ADM, he will make a profit of \$617.90 per hectare, and \$617,900 in total. A producer in Itapúa will make more than one million dollars. Renting land will at least cut the profits in half.

A 5% export fee over the unprocessed grains must then be paid, applied to the net revenue. Traders, as VAT withholding entities, retain 30% of the tax and give the producer a receipt for the tax authorities. And lastly, a 10% profit tax must also be paid, now leaving the producer in San Pedro with a total of 528.304 US dollars. This is a very rough sketch, destined to indicate the (gross) profitability of growing soy. A large portion of the profit is invested, for example in machinery (based on personal communication with ADM staff, July 28, 2014).

The soy value chain

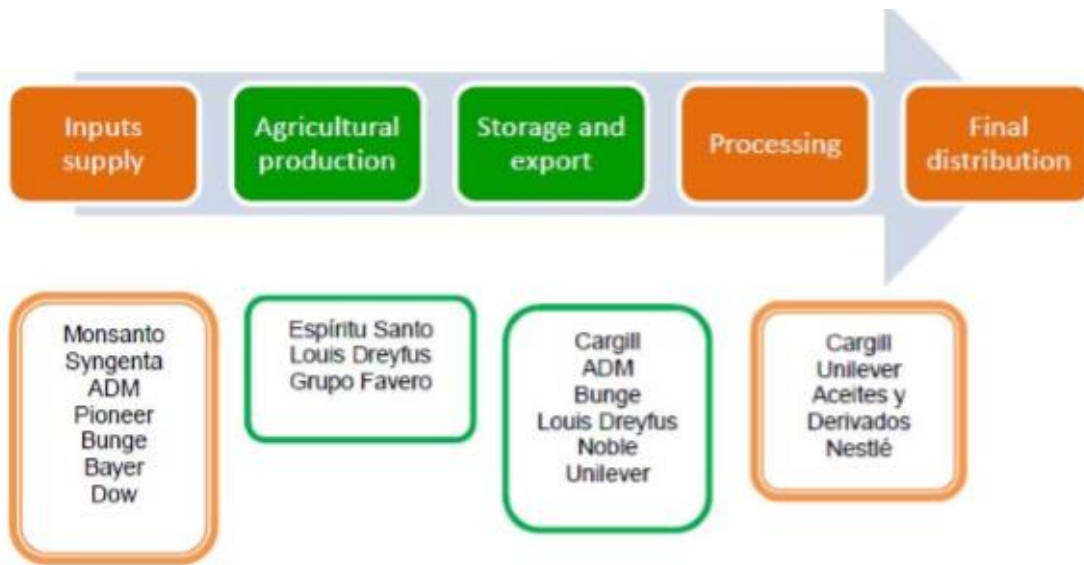


Figure 4. The soy value chain. Source: Guereña, 2013

In her 2013 Oxfam research report, Arantxa Guereña distinguished the above five steps in the soy value chain, with agricultural production and storage and export being the only steps occurring in Paraguay. Each step will shortly be discussed. Inputs are credit, seeds, herbicides, pesticides, fungicides and fertilizers. The traders provide credit in the form of inputs and/or cash, and desire grains in return. However, seeds and some chemicals are also being produced in the country itself. There are multiple SENAVE certified *semillarias*, producing genetically modified seeds. The new varieties are also often custom made for Paraguayan circumstances, and are thus tested and developed in Paraguay. There are also at least two Paraguayan companies that produce pesticides, herbicides, fertilizers etc.: Tecnomyl (whose products ADM also sells) and Chemtec. Tecnomyl also does agro-chemical container recycling. However, both the base seeds and the base chemicals are imported. Fertilizers and pesticides are still the 6th and 8th most imported products (<http://atlas.media.mit.edu/profile/country/pry/>).

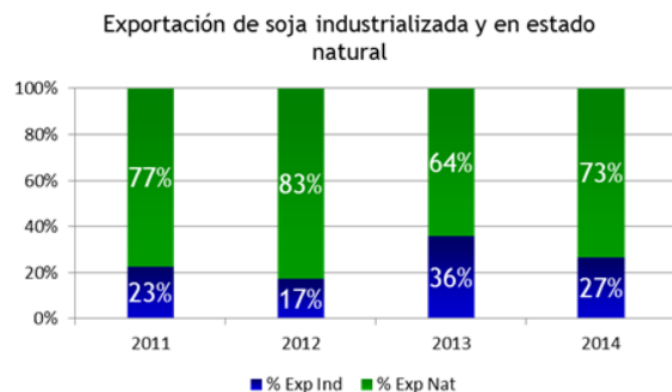
The producers then grow soy with these inputs, after which they need to decide to whom to sell, and when. Most farmers do not have a storage facility (silo) at their farm, so after the harvest, trucks are contracted to bring the soy to a grain trader or cooperative's silo. The traders do their best to procure the grains: *‘There is a lot of competition. There is enough margin, so that's why there are now 12 companies instead of the five that were here a few years ago. So since there is*

a lot of competition, we really need to do the small stuff to keep our clients. A smile can make a difference. They know that, so they barter and we have meetings and then when you think it's arranged they still go somewhere else' (Trading manager ADM head office, interview, 26 February 2014). After bringing the grains to the silo the producer has a timeframe to sell for the best price. He must sell at least part at a certain point, to pay his debt.

For the producer, knowing when to sell is complicated, and depends on several price factors: the prices at the local elevator or silo, Chicago Board of Trade prices, and the future prices. If future prices are higher than current prices, a carry situation, a farmer will sell what he needs to sell to repay his loan, and store the rest (at ADM's silo, for example), in the expectation of better prices. If the future prices are not higher than the current prices, the farmer will try to sell as much as possible. To determine if the prices will remain in a carry, the local and Chicago Board of Trade prices must be analyzed, as well as market trends – demand from food processors, biodiesel producers and the international market, for example (Soybean Export Council, 2011). After buying the grains, the traders have a short window to sell them again. The selling of grains at ADM happens centrally, via the trading department in Asuncion.

From the silos, trucks bring the grains to national harbors, where large river barges then transport the grains to international harbors in Rosario, Argentina or Nueva Palmira, Uruguay, after which the grains are shipped all over the world. The largest importing countries were Russia (16%), Germany (11%), and Mexico (10%), (International Trade Center Trade Map).

Figure 5. Exports in natural or processed state. Source: CAPPRO



In Paraguay, the biggest developments have been made on the processing side of the value chain: with new investments, the soybean crushing capacity has more than doubled in the last two years. Soybean crushing plants produce meal and oil. ADM finished a processing plant with a daily crush capacity of 3,500 metric tons in 2013, and the new joint venture plant from Louis Dreyfus, Bunge and Copagra (CAIASA) is now also operational. Both process more than one million metric tons per year. Cargill already had a crushing plant, processing nine hundred thousand

metric tons per year (<http://www.cargill.com>). Louis Dreyfus also had a plant at the time. With a total production of 8.4 million metric tons in the 2013/2014 season, it is estimated that 4 million metric tons will be processed (Markely, 2013). The graph above, published by CAPPRO, demonstrates that more than one third of soy was exported in a processed form in 2013. So instead of only exporting the raw materials, more added value is created by processing the soy.

Chapter 2. Theoretical Framework and methodology

Institutions are an important factor in shaping human behavior in relation to the environment (Cypher and Dietz, 2009) and each other. In this chapter, institutional theory, which is used to aid in the analysis of Paraguayan soy producer's attitudes towards sustainability, is explained; followed by the resulting conceptual model and the definition and operationalization of sustainable agriculture and sustainability. The research questions that result from this and the literature in the previous chapter are then stated, and lastly the data collection methods are specified.

Institutional theory

There are many definitions of institutions. According to Douglas North, institutions are “rules, enforcement characteristics of rules, and norms of behavior that structure repeated human interaction” (North, 1989). Institutions are the ‘rules of the game’ and determine how things are done. Rules could be tax legislation or property law and a norm of behavior includes letting ladies go first, or driving on the right side of the road. Organizations like the IMF or national governments are also considered institutions, as they give structure to life. All of the examples determine human interaction, some in more abstract ways than others, via formal or informal constraints. Decent institutions are important for economic growth (North, 1989) – a good government can decrease corruption and make it easier to do business, for example. Rehberg puts it differently when he writes that ‘Institutions mediate between social structures on the macro- and micro level on the one hand and actors on the other. They constitute regulations of action that are relatively long-lasting and make rules of behavior binding based on values and norms and sanctions’ (Rehberg, 2006).

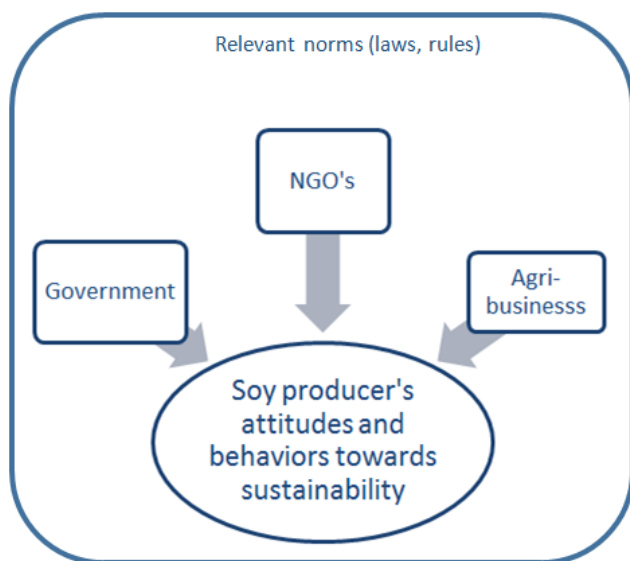
Institutional theory is a study of changing institutions. It examines the processes by which structures, including schemes, rules, norms, and routines, become the ground rules for social behavior (Scott, 2004). So how do norms develop in an existing institution? There are many different forms of institutional theory. In this research, institutional theory will be used in the

broadest sense. However, in a country in which almost everything is arranged on a network basis (instead of merit, for example), Mark Granovetter’s theory of embeddedness is more than relevant. Granovetter states that purposive action is ‘embedded in concrete, ongoing systems of social relations’ (Granovetter, 1985). He argues that the social structure must be taken into account when considering economic institutions, since economic activities are more likely to be undertaken by a group of people or corporations instead of individuals. So basically, economic institutions are all about networks (Granovetter, 1992), and individuals and firms are embedded in social relations. The focus here is on the interaction between the different stakeholders and the producers.

According to North, ‘a norm of behavior that structures repeated human interaction’ is an institution. Thus, the attitudes of soy producers towards sustainability are also an institution. Institutionalism considers how these attitudes became norms, which makes it a very relevant theory for this research. The institutional framework will be used to understand the forces at work in Paraguayan society. Not only are the producers influenced by public, private and civil society actors such as agri-business, the government and NGO’s, but resulting institutions like culture, for example, influence attitudes towards the environment, education and adherence to legislation.

This results in the following conceptual model:

Figure 6. Conceptual model



The soy producer’s attitudes and behaviors towards sustainability stand central, and various actors influence this. The actors are public, private and from civil society.

The government can influence the producers in different fashions, including through legislation, monitoring of legislation, education and stimulating measures, such as subsidies. How strong

the government institutions are will influence the level and type of influence.

The primary sector in Paraguay is the most important one for the economy, making up 80% of its exports. Soy and soy products are the main export products. There is a large industry around soy, further referred to as the agri-business sector, which is defined by the Merriam-Webster dictionary as *an industry engaged in the producing operations of a farm, the manufacture and distribution of farm equipment and supplies, and the processing, storage, and distribution of farm commodities*. Several of the world's most powerful companies are very active in Paraguay, including input providers such as Monsanto and Syngenta, and grain traders such as ADM, Bunge, Cargill and Louis Dreyfus, also known as the ABCD's. Protecting their interests and their profits is essential, and the sector is an important determinant of producer behavior. A few of the major players in the soy industry and their methods are described, after which their discourse relating to important issues is analyzed to determine their influence on the soy producers.

Axford et.al. define civil society as *'that realm of social activity that is not to do with the state or the market, and that would include, for example, membership of voluntary organizations like football clubs and pub quiz teams'* (Axford et.al 2002). Non-governmental organizations (NGO's) are part of civil society and a third actor of influence on producers. They focus on values and beliefs, and derive their power from their ability to speak to tradition, community benefit and values (Bendell, 2000). Several NGO's based in Asuncion are described, after which their discourse relating to important issues is also analyzed to determine their influence on the soy producers. As NGO's often represent campesinos, campesinos are not added as a separate actor in the model. The objective of this thesis is to represent the perspective of the large scale producers, so campesinos were not interviewed, even though it is recognized that they could possibly have an effect on the producer's attitudes towards sustainability.

Lastly, the actors that influence the producers all operate within the perimeters of an existing normative framework. These overarching principles which influence every actor include the institutional faults of the Paraguayan government, such as corruption, as well as environmental and tax legislation. These norms will be shortly described and analyzed.

Sustainable agriculture

What is sustainable agriculture? According to Jules Pretty in Desai and Potter (2008), sustainable agriculture includes the following:

Systems high in sustainability can be taken as those that aim to make the best use of environmental goods and services, while not damaging these assets. The key principles for sustainability are to:

- *Integrate biological and ecological processes, such as nutrient cycling, nitrogen fixation, soil regeneration, allelopathy, competition, predation and parasitism, into food production processes;*
- *Minimize the use of those non-renewable inputs that cause harm to the environment or to the health of farmers and consumers;*
- *Make productive use of the knowledge and skills of farmers, so improving their self-reliance and substituting human capital for costly external inputs;*
- *Make productive use of people's collective capacities to work together to solve common agricultural and natural resource problems.*

The Roundtable on Responsible Soy (RTRS) translated sustainable agriculture into a specific list of standards, which is a mix of good agricultural practices and environmental responsibility standards (such as maintaining on-farm biodiversity). These standards were used as a baseline in the interviews.²

One sustainable agriculture paradigm is the intensification of resources, or making better use of them (Pretty 2000, Tegmeier and Duffy 2004 in Desai and Potter 2008). In his inaugural lecture upon taking the position of chair in Farming Systems Ecology at Wageningen University, Pablo Tittonell states that ecological intensification may be the ‘*way to break through the typical trade-offs between productivity and conservation, or between livelihoods and ecosystem services..... Food production can increase and at the same time be sustainable through the ecological intensification of current agriculture, making intensive and smart use of the natural functionalities that ecosystems offer.*’ He hypothesizes that extensifying agriculture in the North and intensifying it in the South can improve the livelihoods of many rural families. In developing

² See Annex 2 for the full list.

countries, there is only a 10% yield difference between conventional and organic production methods. (Tittonell, 2013).

Operationalization of sustainability

Sustainability is an ambiguous concept, difficult for many to define. The definition of sustainability used in this research is based on the Brundtland reports: as development that meets the needs of the present, without compromising the needs of future generations (World Commission on Environment and Development, 1987). During field work, it quickly became obvious that the producers do not have an attitude towards sustainability, as they are unfamiliar with the concept. For the research, it is hence imperative that sustainability is clearly operationalized. The three spheres of sustainability - economic, social and environmental – became the basis of the interviews.

To determine the attitudes of producers towards sustainability, their opinions on issues surrounding the soy production, as well as those of the other actors, are specified. The three spheres are used to categorize the relevant issues in the debate on soy. The economic sphere concerns the extractives of the sector, the environmental sphere involves the discussion on Genetically Modified (GM) soy, agro-chemical use and deforestation, and the social sphere regards the position of campesinos and foreignisation.

Besides the attitudes of the producers on general issues surrounding soy, sustainability can also be determined by the actions (or behaviors) of producers on their farm. Below, one or more indicators per sphere are further explained. The chosen indicators are based on extensive literature reviews and interviews.

By the first interview, it had become clear that growing soy is a lucrative business, so the economic part of the analysis mainly concerns recent and future investments. One interviewee said *‘the Brazilians don’t care about taking care of the soil here, they use it for five years, sell it and then go somewhere else’*. If the farm plans would indeed be so short term, it could have an impact on sustainability. So questions such as ‘What is the last big investment you have done’ and ‘What are your future plans and goals?’ are used to determine how long a producer plans to stay in a certain area.

In the social sphere, the relationship that producers have with campesinos and employees is important. The social problems in the country are large, and according to the allegations made by many NGO's, related to the production of soy. The income and land distribution inequity are alarming and the basis of much discontent. As part of the small group that has access to technology and credit and owns land, how do the large producers think of campesinos and how do they (say they) treat their neighbors? Employees are often from neighboring communities. How many employees are there, are they paid enough and trained decently?

Environmentally, the knowledge of and adherence to environmental legislation and Good Agricultural Practices is used as an indicator. The most important environmental legislation is explained in Chapter 3. The bases for the interviews are the Good Agricultural Practices (GAP) as defined by the Roundtable on Responsible Soy in their standards for responsible soy production³.

Research questions

The research questions following from the literature, institutional theory and the conceptual model states:

What are Paraguayan large scale soy producers' attitudes and behaviors towards agricultural sustainability, and why?

Who are the large scale soy producers?

What are the large scale soy producer's attitudes towards sustainability?

What are the large scale soy producer's behaviors towards sustainability?

How are the large scale soy producers influenced by agribusiness, government and NGO's?

³ See Annex 1 for the full interview and Annex 2 for the RTRS standards.

Data collection methods

In the first phase of the research, in the Netherlands, a literature study of the general soy situation in Paraguay took place. This included reports such as Oxfam's *Soy Mirage*, a BBC documentary on the negative effects of GMO soy in the country, articles on the Roundtable of Responsible Soy, land tenure issues, campesinos, the power of agricultural multinationals, etc. These reports have sketched a negative picture of the situation from various focal points. In Paraguay, the literature study continued, to learn more about the government system, tax and environmental legislation, the use of agro-chemicals, good agricultural practices, and genetically modified crops.

The second phase of the research took place in Asuncion, the capital city of Paraguay. In this phase, NGO's and people affiliated with NGO's were interviewed (WWF, Solidaridad, BASE-IS), as well as many organizations in the agri-business, such as the host organization, ADM, the general producers' union (UGP), the grain traders' unions (CAPECO, CAPRO), and two people affiliated to businesses who were trying to do it 'right': the director Desarrollo Agrícola Paraguay (DAP) and the sustainability officer of the Payco group. In the first week it became clear that civil society and the agricultural sector see things very differently, and that the discussion is both polarized and sensitive.

In the third phase of the research, an 'ideal' farm was visited. Golondrina is part of the Payco Group, and investment group with multiple farms in Paraguay. Sustainability is a great priority for Payco, and with this mandate the managers of the farms can implement measures unknown to other producers. The discussions with the managers and sustainability officer were helpful in realizing that the path to sustainability is not clearly marked, and sometimes full of contradictions.

In the fourth phase of the research, ADM silos were visited, and twenty two soy producers were spoken to. This only occurred after gaining in depth knowledge of the situation in the previous phases. The silos were chosen based on the availability of local staff and lodging. Producers near Campo Nueve, Magagnin, Curuguay and Guayibi were visited, in the departments of Caaguazú, Alto Parana, San Pedro and Canindeyú. Large scale producers who have more than 1000 hectares of soy were the focus, however this depended on their availability. Smaller producers were also interviewed.

During the last week in Asuncion, (ex) government officials were spoken to from institutions, such as the Secretary of Environment (SEAM), Ministry of Agriculture, and the National Service for Plant and Seed Quality, or SENAVE. The final phases of the research involved more literature research, cross-checking findings with experts, analyses and writing.

Chapter 3. Relevant actors and system characteristics

In this chapter, the actors surrounding the producers are further described, namely agri-business, NGO's and the government. After introducing the actors, several framework characteristics – clientelism, power of the legislative government branch, tax and environmental legislation – are described. All the actors act within the parameters set by these norms.

The Actors

Agribusiness

There are four (overlapping) categories of global agri-food companies – the input providers, the traders, the food processors and the food retailers. The first two categories are the most prominent in the Paraguayan agribusiness scene, and include companies such as Monsanto and Syngenta and the ABCD traders: ADM, Bunge, Cargill and Louis Dreyfus (Murphey, Burch and Clapp 2012). These companies have applied horizontal (across products) and vertical (from production to distribution) value chain integration to exploit economies of scale. Horizontal integration is often achieved by acquiring important national companies (Valiante, 2013). In 1997, Bunge bought the fifth and then the first largest trading companies in Brazil, for example. Vertical integration is achieved by maintaining good relationship with the larger farms, but the traders also produce, procure, process and deliver raw material inputs, provide seed, fertilizer and agrochemicals to growers, and then buy, store and transport it in their own facilities. The ABCD's are enormous, accounting for between 75 and 90% of global grain trade. Because Cargill and Louis Dreyfus are privately owned, the exact figures are unknown (Murphey, Burch and Clapp, 2012).

There are concerns about the size and the accompanying power these companies have worldwide. The ABCD's have such large storage capacities that they are technically able to create a worldwide artificial shortage. Because there is no public body that oversees global

physical stocks, it is impossible to see if these companies are manipulating their stocks (Missbach, 2012 in Khan, 2012). Another concern is the fact that international trading companies have billion dollar hedge funds, private equity branches and sell derivatives to clients, basically making them similar to banks. But while banks are under more regulatory scrutiny since the 2008 crisis, these companies are not (Khan, 2012). The lack of transparency, lack of rules around insider trading (Khan, 2012) and the fact that these companies control the physical stock and benefit from releasing this stock, gives these companies a great deal of power over basic consumer goods (Murphey, Burch and Clapp 2012). Another problem related to the traders is that ‘they extract much of the value along the chain, while costs and risks cascade down on to the weakest participants, generally the farmers and laborers at the bottom’ (Murphey, Burch and Clapp, 2012).

Since the traders generally employ the same activities, ADM will be explored in more detail below.

ADM

Archer Daniels Midland was established in 1902 in Decatur, Illinois, and started being a major player in the 1970’s. In 2013, net sales were \$89.69 billion (www.marketwatch.com, accessed 01-07-2014), and it is the world’s third largest processor of oilseeds, corn, wheat and cocoa. It also makes food ingredients, animal feed, chemicals and energy products, and operates in more than 75 countries (Murphey, Burch and Clapp 2012).

Basically, traders buy and sell grains, physically and in futures. ADM started its business in Paraguay in 1997 by purchasing the local grain divisions of Glencore and Silo Amambay (Reuters, 2013). According to its website, ADM handles approximately 30% of all of Paraguay’s grains. ADM also sells inputs, processes the grains in their own crushing plant and has chemical blending plants. In Paraguay, the company owns 30 elevators, a trucking company, two river transportation companies (13 tugboats and 230 barges) and one port, leasing another 3 ports (www.adm.com).

It is clear that ADM and the other traders have a great deal of power in the country, and with power comes responsibility. However, sustainability and corporate social responsibility (CSR) seem to be more important on paper than in practice. In Paraguay, ADM’s sustainability department consisted of one person until April 2014, and now consists of two (the company

employs approximately 1300, ADM staff, interview, 17 February 2013). The department is responsible for the development and implementation of CSR and sustainability programs, which includes the projects with (for example) Habitats for Humanity, managing the ADM Cares program in Paraguay, and implementation of the ISCC certification scheme for biofuels. In a country that knows so little about sustainability and in a sector as traditional as agri-business, two people is insufficient. Besides this, each and every project and policy, even the decision of a silo to support a local school, must be approved by the CSR department at the head office in Chicago (interview 02-04-2014). The American company is traditional and hierarchical, and apparently a very difficult partner at the Roundtable for Responsible Soy discussions (interviews 21-02-2014 and 20-03-2014). ADM Paraguay does not educate the producers or its staff on good agricultural practices or environmental legislation.

A recurring argument from ADM and other people in the sector was that there is not enough demand for sustainable soy. European consumers are slightly more aware, but the overall demand from Russia, China and Mexico is so much bigger, that ‘what right do the Europeans have, coming here and telling us how to produce?’ (S. Cavazutti, interview, 10 February 2014). If the soy is not good enough for Europe, it will simply be sold somewhere else. Due to the fact that nothing extra is paid to producers to be more sustainable, and that certified soy only sells for a few dollars more per ton, there is no financial incentive for the producers to do so.

Lobby organizations

Besides the businesses, there are also several agricultural lobby organizations which play an important role. These organizations are powerful, have smart, media savvy leaders, are an important determinant of the agri-business discourse, and a force to be reckoned with by the government.

UGP – Union Gremio de Productores

The UGP is the union of the producer cooperatives and a strong lobbying organization for the entire agricultural sector. Paraguay is an agricultural society, dependent on its grains and meat. According to the UGP, the interests are not only national, as Paraguay can use the wealth it has in its earth, water and climate to feed the world’s population (S. Cavazutti, interview, 10

February 2014). With knowledge of biotechnology (UGP has a contract with Monsanto, so they have the knowledge in-house), history and agriculture, they defend modern agriculture. Easy access to media channels simplifies this. At least one representative of the UGP is also a soy producer.

CAPECO – Camera Paraguaya de Exportadores y Comercializadores de Cereales y Oleaginosas

CAPECO is a chamber that defends the interests of the soy and grain exporters, which includes many small(er) companies as well. Activities that increase the competitiveness of Paraguayan crops – for example support in production or export, or lobbying for better infrastructure – are the main focus. According to CAPECO’s vision, the only form of sustainable growth of the agro-industry is via export (www.capeco.org.py). The world is demanding commodities, which Paraguay can provide. Smallholder agriculture cannot meet the world’s needs and does not make enough profit, and must be educated in order to be able to produce commercial grains (I. Santiviago, interview, 14 March 2014). Education is especially in the sense of the great advantages of bio-technology.

CAPPRO – Camera Paraguaya de Procesadores y Exportadores de Cereales y Oleaginosas

CAPPRO does more or less the same as CAPECO, but is focused on the interests of the processors, which include the ABCD traders and Noble. Processors crush soy, making oil and meal, for example. One issue they were lobbying for was differentiated taxes for producers, exporters and processors. According to the manager, producers have a profit of approximately 60%, exporters of 10% and processors of 6%, and yet they all pay the same percentage of taxes. The processors also invest much more, create more added value and more jobs. It would be fairer if they paid less, since they are doing so much for the country (E. Fernández, interview, 13 February 2014).

NGO's

There are many different NGO's and organizations working on the social and environmental issues in Paraguay. From the start, one division between them can easily be made: there are NGO's that are willing to work with the agro-sector to help them improve, the pro-business group, and then there is a group that is very against the current model, or the 'fundamentalist' group. The last group is also often referred to as the 'extreme left' group. Solidaridad and WWF are examples of organizations that belong in the first group, BASE Investigaciones Sociales (BASE-is) in the second.

Pro-business

Solidaridad Paraguay currently consists of one person. The goal is to create a platform where everyone can cooperate, and thus create a meaningful impact, by negotiating and talking, but not by pointing fingers (interview 11-02-2014). This is done by promoting the implementation of Rural Horizons, participating in various initiatives and negotiating with big firms.

The WWF has a larger presence in the country, and is especially known for their work against deforestation. With the current Transforming Markets campaign, WWF works with big companies to preserve biodiversity. In Paraguay, the organization is also working on mapping the country so areas with high conservation value can be identified and monitored.

'Fundamentalist'

BASE-is is a left-oriented research organization focusing on the rights of the smallholders in the country. They are against GMO's, modern agriculture and thus large scale soy production. According to them, sustainable soy production is impossible, and agriculture should return to the smallholder model. This has made dialogue with large scale agriculture difficult. But due to the many reports they have written, a great deal of knowledge and insight on the situation is available for whoever is interested.

The government

President Cartes is the head of a representative democracy that, according to the 1992 constitution, embraces separation of powers. The legislative branch, or Congress, is comprised of the Senate and the Chamber of Deputies. Its members are elected from the 17 departments for 5-year terms that coincide with the president's 5-year term. The president is chief executive and Commander in Chief of both the armed forces and the police. The judiciary includes a Supreme Court of 9 Supreme Court Justices, who are appointed by the president and the Senate for 5-year terms, which are renewable. Judges cannot be removed after 2 consecutive terms until they reach retirement age. The Supreme Court controls its own budget and heads a system of lower courts and magistrates (www.nationsencyclopedia.com).

Ministry of Agriculture and Beef (MAG)

The Paraguayan government recognizes the exclusion of smallholders in the country. According to its website, one of the goals of the Ministry of Agriculture and Beef (MAG) is to strengthen the family, community and indigenous agriculture (www.mag.gov.py). The current vice minister, Mario Leon, says that the Ministry is more focused on smallholders than on the large scale producers, but the policies were not effective: *'campesinos have gotten used to receiving money from the government, and this needs to stop'*. Policies were plagued by corruption and the fact that *'Paraguay does not know how to administer its resources'* (M. Leon, interview, 22 April 2014). However, according to an Oxfam report, only 5% of MAG funds actually went to the smallholders. The same report says the government mainly supports large scale agriculture, through subsidies and favorable taxes (Itriago, 2012).

One problem MAG faces in implementing coherent and efficient policies is the fact that it has eleven independent bodies working under its wings, including the land distribution agency (INDERT), the forestry agency (INFONA) and the beef fund (FG). Each body has an own agenda and interests. Due to these interests and the fact that these bodies are not obligated to cooperate, it is very difficult to work together. A recently presented management system called SIGEST is supposed to increase coherence, and promote integrated, inclusive and sustainable development (M. Leon, interview, 22 April 2014).

Secretary of the Environment (SEAM)

The environment does not have its own Ministry in Paraguay; it is a Secretary, meaning that it is one of the eleven independent bodies controlled by MAG. The status of the SEAM is a clear indicator of the low priority given to the environment in Paraguay. A very weak institution, the SEAM has a difficult job to do with a severe lack of budget and a culture in which people are not used to taking care of the environment. For example, the institution is in charge of 33 national parks and protected areas, and has 24 park rangers to do this (SEAM officials, interview, 11 April 2014). A popular allegation towards the SEAM is that ‘all the people who can’t do anything or were fired from other ministries are put in the SEAM’ (personal conversation, 21 March 2014). This low institutional capacity became very clear during a visit. Not only are the facilities worn out, the interviewed officials had serious knowledge gaps.

With a total of eleven environmental inspectors and two pick-up trucks, it is clear that there is also no capacity for better monitoring of the laws. The Secretary can only do controls based on filed complaints, as they do not have the capacity to do random checks (SEAM officials, interview, 11 April 2014). So most producers have thus never had a visit from the SEAM. In rural areas in Paraguay, adherence to environmental laws is based on personal ethics.

The National Service for Plant and Seed Quality (SENAVE)

Also an independent body under MAG, the SENAVE implements international conventions and agreements related to the quality and health of agricultural plants, seeds and plant varieties and biotechnology species. It is also responsible for the registration and approval of new seed varieties, and monitors and audits accredited laboratories, warehouses and pesticides transporters in the country. *The SENAVE has a great operational capacity that the SEAM. It is the public institution with the highest number of technicians and scientists in Paraguay and has regional offices throughout the country. The SENAVE plays a key role in the soy industry as it proposes, implements and controls laws and regulations concerning GMO’s and agrochemicals. Although it is officially an autonomous entity, it is under close watch of the soy lobby, which frequently exerts pressure to influence its actions* (Gijssenburgh, 2014). The soy lobby no longer needs to watch SENAVE as closely, because in August 2013 the former president of the soy lobby, APS, became president of SENAVE.

2. Relevant system characteristics/ norms

The producers, government, NGO's and agri-business in Paraguay all function in a system with characteristics that determine how they behave, or should behave.

Strong legislative power

Paraguay has little democratic tradition, reflected in short democratic periods in history, and long periods of political instability and dictatorial regimes combined with the hegemony of a political party for 61 consecutive years (Borda and Caballero, 2013). While the constitution states that it embraces a separation of powers, reality is different; as there is a great imbalance between powers. The 1992 constitution was written in the context of the end of a long dictatorship, which was characterized by arbitrariness and abuse of power of an authoritarian government. For this reason the Constitution gave important powers to the Legislative branch, to the detriment of the other powers. Congress can easily lift a veto of the Executive Branch and has almost unlimited powers in the Executive branch's own areas. The budget may be amended by parliamentary initiative, on any topic and in any season, regardless of their technical feasibility (creation of charges, wages, increased expenses etc...). Congress also influences appointments within the *Executive* branch (e.g. National Development Bank, National Institute of Cooperatives, Ministry of Metropolitan Transportation, etc.) as well as the *Judiciary* branch (ministers, magistrates, etc.). In some cases Congress even assumes a role of quasi administrator, which would correspond entirely to the executive branch, such as proper budget management (Borda and Caballero, 2013).

Clientelism

A second feature of institutional weakness is political patronage, a widespread practice in the state administration (Borda and Caballero, 2013). In his analysis on clientelism, Hicken states that while there is no generally accepted definition, there are four returning elements: a patron to client relationship, contingency or reciprocity, hierarchy and the ongoing nature of the relationship. An analyzed definition is that of Kitschelt & Wilkinson: "the direct exchange of a citizen's vote in return for direct payments or continuing access to employment, goods, and services," as well as Stokes': "the proffering of material goods in return for electoral support,

Figure 7. 2013-2014 Global Competitiveness Report on Paraguay's Institutions. Source: World Economic Forum

The Global Competitiveness Index in detail

INDICATOR	VALUE	RANK/148
1st pillar: Institutions		
1.01 Property rights	3.1	132
1.02 Intellectual property protection	2.3	141
1.03 Diversion of public funds	2.0	141
1.04 Public trust in politicians.....	1.5	145
1.05 Irregular payments and bribes.....	2.8	128
1.06 Judicial independence.....	1.7	146
1.07 Favoritism in decisions of government officials	2.1	143
1.08 Wastefulness of government spending.....	2.0	142
1.09 Burden of government regulation	3.8	40
1.10 Efficiency of legal framework in settling disputes	2.5	141
1.11 Efficiency of legal framework in challenging regs.	3.1	99
1.12 Transparency of government policymaking.....	4.0	84
1.13 Business costs of terrorism	5.0	101
1.14 Business costs of crime and violence.....	3.4	122
1.15 Organized crime.....	4.1	121
1.16 Reliability of police services	2.2	146
1.17 Ethical behavior of firms	3.0	142
1.18 Strength of auditing and reporting standards	4.0	109
1.19 Efficacy of corporate boards	4.2	105
1.20 Protection of minority shareholders' interests	3.5	119
1.21 Strength of investor protection, 0–10 (best)*	5.7	57

where the criterion of distribution that the patron uses is simply: did you (will you) support me?" (Hicken, 2011). The prevalence of personal over national interests obviously has detrimental effects for the (development of the) state. In Paraguay, as in other countries, the consequence of this widespread practice is poorly developed institutions (Borda and Caballero, 2013).

Paraguay's institutions are generally weak and governed by corporate interests and political clientelism. The World Economic Forum publishes a yearly Global Competitiveness Report, which assesses the competitiveness landscape of 148

countries, and provides insight into the drivers of productivity and prosperity (World Economic Forum, 2013). In the 2013-2014 report, Paraguay ranks 119 out of 148. In the detailed country report, however, it becomes clear just how poor some of Paraguay's institutions really are. Paraguay's judicial independence is the third worst in the world, with only Venezuela and Burundi having worse independence. Public trust in politicians, favoritism and reliability of police services are also among the lowest in the world.

The tax system

Paraguay has a low legal compliance in society and a particularly low 'tax compliance moral'. The evasion is estimated to be around 50% (Itriago, 2012) and reflects a vicious circle: a weak state, corruption, inefficiency, scarcity of resources and poor quality of public policies (Borda and Caballero, 2013). Concerning personal income tax, Act 4673/2012 has only been in force as of August 2, 2012. 10% is to be paid by those who earn more than 10 times the minimum

monthly wage⁴. According to an ADM employee, to pay income tax, a person must first register at an office. The tax authorities do not send summons, this happens on a voluntary basis. Not registering and not paying is thus rarely checked. Secondly, an accountant can easily falsify income and receipts, especially if he has someone in the tax bureaucracy to make his job easy (ADM staff, interview, 25 March 2014). Due to the current corruption rates and a resulting low trust in governmental institutions (see figure 1), paying taxes is difficult for many. However, when it is so easy to not pay taxes or to falsify income, moral superiority is practically required of the Paraguayan citizen to pay his taxes.

The agricultural sector in Paraguay has its own tax. Until 2014, the sector paid taxes via the IMAGRO (*el Impuesto a las Rentas de las Actividades Agropecuarias*), which taxed income based on estimated agricultural activity (Itriago, 2012). After a much protested tax reform, the sector pays taxes via IRAGRO, which stands for the same. In IMAGRO, producers were taxed based on the size of their landholding. In IRAGRO, producers are taxed based on their real income, or net output, and pay 10% taxes over their profits, and 5% VAT over agricultural exports. Up to 50% of this 5% is returned (ABC Color, 2013). This means that when a producer comes and sells his grains to ADM, he pays the 5% to ADM, and ADM pays it to the government. Another change concerns the use of so-called ‘arm’s length’ pricing instead of ‘transfer pricing’. The traders (ADM, Bunge, Cargill, Louis Dreyfus) would declare profits of 3% in Paraguay, based on transfer prices – versus 20% if arm’s length had been used (The Economist Intelligence Unit, 2013).

However, there are a few problems with the new reform. By taxing only net output, unproductive landowners are not stimulated to be more productive. In a country in which land distribution is the major topic of economic and social conflict, landowners who leave their land idle should also be taxed. Another problem is the expected surge of new taxpayers and the limited capacities of the tax service. It is expected that the tax authorities, who are also busy dealing with the tax evasion, will not be able to handle the new flows (The Economist Intelligence Unit, 2013).

⁴ This figure changes regularly, now (since 01-03-2014) monthly minimum wage is 1.824.055 Guarani, or approximately 305 Euros.

Taxes are meant to redistribute wealth. In Paraguay, not only has this failed, but the poor are paying the largest percent of their income. Of total tax revenue, a large part is due to the value added tax, or VAT. The different rate on basic consumer goods or luxury goods is small, which means that the poorest 20 per cent of people pay 18 per cent of their income as VAT, while the richest 20 per cent pay 14 per cent (Itriago, 2012).

Environmental legislation

In 1992, upon the transition to democracy, several new environmental laws were introduced. However, the Paraguayan legal system is very dependent on criminal law (instead of civil, environmental or administrative, for example) to protect the environment. This results in a minimal public role and an 'ineffective, reactive system for environmental protection' (Boyd, 2012). There are problems with the enforcement, due to several interrelated reasons: the 'developing economic policy, institutional weakness, legislative gaps and inconsistencies, limited technical norms, lack of monetary resources, and a cultural and informational weakness'. The limited political commitment, a lack of human resources and unclear responsibilities between the institutions (Bass and Muller, 2000) demonstrates the institutional weakness.

The Paraguayan constitution states that every person has a right to live in a healthy and ecologically equilibrated environment, activities that may result in environmental alterations will be regulated by law, and law will define and establish sanctions for environmental crimes. Any damage to the environment will entail the obligation to restore and pay for damages. Every person has the right to demand from public officials to adopt measures to defend the environment, the integrity of their natural habitat, public health, national cultural heritage, consumer's interests and other. Anyone who considers him or herself seriously affected by a clearly illegitimate act or omission, or anyone whose rights are in imminent danger, and cannot seek a remedy through regular legal channels, may file a petition before a competent judge (Abed, 2009).

The constitutional right to a healthy environment is used to reject lawsuits claiming that environmental regulations violate economic development (Boyd, 2012). However, Abed concludes that the '*juridical configuration of the Paraguayan environmental judicial system is*

dysfunctional with regard to the objective of guaranteeing the right to live in a healthy and ecologically equilibrated environment' (Abed, 2009). Since investment and economic growth is considered more important (Bass and Muller, 2000) and government institutions, including the judiciary independence, are extraordinarily weak, this is quite a fair statement. Below, three major laws that every person in the agricultural sector should know are shortly described.

Act 294/93. The Environmental Impact Assessment

The Environmental Impact Assessment (EIA), is Paraguay's most important environmental and legal norm. This law states that the majority of economic activities, both public and private, need an environmental license to operate, so that the environmental effects of the business can be analyzed. Most comply with acquiring the license, as it is an unavoidable legal requirement necessary to obtain access to bank credit, to be granted tax exemptions and to obtain other public authorizations (Abed 2009). Businesses hire a consultant listed by the SEAM to do an audit and submit the report for the license. The report also lists recommendations for improvement, which subsequently should be audited and controlled for.

In September 2013 Decree 453 modified the Environmental Impact Assessment Law. The new regulation sets new, lower minimum standards to be met by businesses, supposedly so that time and funds are not wasted on evaluating businesses which are not causing harm to the environment (ABC Color, 2013). Although Decree 453 does state that the license needs to be renewed every five years (previously, every two years), the license is rarely renewed and the SEAM officials do not check if businesses have actually implemented the listed improvements (G. Helman, interview, 26 February 2014).

It has a wide scope, so officials can apply enforcement in areas that lack regulations, such as transportation and disposal of hazardous wastes (Abed, 2009). However, due to the weak institutional capacity of the SEAM, reality is different. The EIA thus mainly has a preventive function, and that there are no punishments for violators (F. Gurrieri, interview, 28 February 2014).

Act 3742/09. Control of agricultural phytosanitary products

The law on control of phytosanitary products used for agriculture was enacted on 22 May 2009, and relaxed all existing regulations regarding the protection of communities and water sources against pesticide spraying. It was promoted by the major soy bean farmers. Despite opposition by campesino organizations and NGOs, the influence of these major soy bean farmers resulted in the approval of this law (Dutch soy coalition). Articles 67 and 68 of this law specify the three types of planted barriers producers need to have: beside neighboring communities, water sources and public roads. To protect neighboring communities from agro-chemicals, a border of 100 meters is required. To protect water sources from possible contamination, a border of at least 100 meters wide needs to be planted beside lakes, streams, rivers etc., depending on the width of the water source. Most of the reforestation efforts start near water. Next to public roads, a border of 5 meters wide and 2 meters high was (is?) required. The law further specifies regulations concerning the sale, transport, packaging, storage, fumigation and disposal of the chemicals.

Act 422/73. Forestry Law

The main legal framework for the forestry sector in Paraguay has been provided in the Forest Law of 1973. This law establishes fiscal incentives for reforestation; defines forest land as reserves, production forest, or semi-protected forest; and sets up regulations and fines to protect the forest resources. For example, this law states that landowners and producers should protect 25% of forested land on properties larger than 20 hectares. To date, the law has been bypassed due to little political will and the fact that, until 2001, forests had been acknowledged as unproductive systems.

In 2004, Paraguay brought into force a Zero Deforestation Law, which prohibits the conversion of native forests to agricultural areas or areas for human settlements in the Upper Parana Atlantic Forest (UPAF). By 2006, Paraguay had reduced its deforestation rate by 85% and received international recognition for these efforts. This number is still declining and the deforestation rate is now between 90 and 95%. Despite the declining deforestation in the Atlantic Forest, there has been a significant increase in deforestation outside the limits of the Atlantic Forest,

especially in the western Chaco region. The current deforestation rate in this region is estimated at 500 ha per day (Dutch soy coalition).

A new act might be able to counter this development. Act 3001, the Environmental Services Law, states that those who have more than the obliged amount of forest, can sell certificates of the extra amount of forest to those who do not have 25% forest. Every native hectare of forest is worth 3.311.404 Guarani (approximately 550 euros), and non-native hectares are worth 2.517.405 Guarani (approximately 420 euros, ABC Color, 2014). This amount was calculated with REDD, and keeps the opportunity cost of growing soy versus being a forest keeping into account (interview Ruiz Diaz, 11-02-2014). Golondrina is one of the first farms to participate, with 4.520 of their 13.000 hectares of forest certified. The company receives roughly 249.000 euros for their 'extra' forest.

Chapter 4. The soy producers

In the discussion on soy, the soy producers have been depicted as large landowners who live in the city and have their farms guarded by security (Abramson, 2009), shoot campesinos who refuse to sell their land (Howard 2009) or simply take campesino's land (Datta, 2006). Their farms are responsible for soil degradation, water contamination, deforestation and a loss of biodiversity (Gudynas, 2008, among others). The national press is very negative on the agricultural sector, as are various government officials; culminating in a SEAM official saying that 'soy is the pest of Paraguay'. In this chapter, the soy producers will be introduced.

In five weeks' time, 22 producers near Campo Nueve, Magagnin, Curuguaty and Guayaibi were visited, in the departments of Caaguazú, Alto Parana, San Pedro and Canindeyú. With a few exceptions, the farmers interviewed loved their profession, worked hard and were proud of what they had accomplished. They were often dirty from yet another day's work, lived in close vicinity of their fields and felt honored that someone was interested in their perspective.

Figure 8. Map of silo locations.



Most of the producers were under fifty, had families and were middle class to upper middle class income wise. This is an estimation based on appearance, vehicles, home and the interview. The division of tasks is classic: the husband is responsible for the business, the wife for the children, house and sometimes the farm administration. None of the company farm manager's families lived with them, but in cities nearby (in three of the five cases: Ciudad del Este). The main reason was education for the children, but boredom and safety also played a role in some cases.

Clothing generally consisted of blue jeans, leather boots and a shirt. Most had a cap with a seed, chemical or silo name/ brand on it. Since most of the country's infrastructure consists of red dirt

roads, a pick-up truck is an essential mode of transport (and also a way to demonstrate good fortune). Popular models are Toyota Hilux or Ford Ranger.

Nine interviews were conducted at the producer's homes, three on the farm and the other ten in offices. Almost all interviews were accompanied by *tereré*, which consists of iced yerba mate tea. Seven of the producers had very nice homes, four of which were fairly new. At least two houses had swimming pools and most a flower garden and well-maintained lawn⁵. Two of the visited homes were in town, the rest in the countryside, close to the fields. One of the producers built his own home, using the trees they had cleared when they first arrived. The producer's homes in the countryside were remote, without neighboring houses nearby, but surrounded by their fields and barns. A long drive on dirt roads was usually necessary to arrive. Three of the five company farms had guards in the front, as did one producer.

Farm size

A large soy producer in Paraguay plants 1.000 hectares (10 square kilometers) or more, and the objective was especially to interview this group. Five of those interviewed were farm managers

Figure 9. Interview set up with a farm manager. Own photo



for companies, which often invest in agriculture to diversify. These farms are among the largest, ranging in size from 22.000 to 3.200 hectares. Due to the larger amounts of capital that these farms have and the fact that the managers generally have an academic education, these are not average farms.

The largest company farm, with 22.000 hectares, is Golondrina, owned by a Portuguese/German firm called Payco. They have 13.000 hectares of forest, 7.000 hectares of soy and 2.000 hectares of wheat, as well as their own silos,

⁵ This is rare in Paraguay.

Silo/ place	Interviewd at	Private or company	Since	Total hectares	With soy	Born in	Nationality	Age	Education
Golondrina	Office on farm	Company	30 years	13000	7000	N/A	Portugese-German	N/A	Uni
Curuguaty	Office	Company	5 years	3200	1030	N/A	Brazilian	N/A	
Curuguaty	Office	Company	20 years	16000	1500	N/A	Paraguayan	N/A	
Guayibi	Farm	Company	20 years	4000	1830	N/A	Paraguayan	N/A	Uni
Guayibi	home	Company		6500	2300	N/A	Venezuelan owned	N/A	Uni
Campo Nueve	Office	Private	birth			PY	Mennonite	50-60	none
Campo Nueve	Office	Private	birth	470	470	PY	Paraguayan	30	none
Curuguaty	Home	Private	11 years	1500		PY	Brazilian	40	
Guayibi	ADM office	Private	1 year	900	300	BR	Brazilian	40	Uni
Magagnin	Home	Private	26 years	1150	900	PY	Paraguayan	50-60	Uni
Magagnin	Home	Private	24 years	1900	1900	py	Brazilian	20	High School
Guayibi	Home	Private	30 years	1000	1000	BR	Brazilian	50	
Magagnin	Home	private	20 years	800	800	BR	Brazilian	40	none
Curuguaty	Farm	private		500	500	BR	Brazilian	40	
Volendam	Colony office	Private	30 years	470		PY	Mennonite	60	
Magagnin		Private	25 years	960	900		Brazilian		none
Magagnin	Farm	Private	30 years		800	BR	mix	50	none
Guayibi	home	Private	40 years	670	430	BR	Brazilian	60	none
Magagnin	home	Private	18 years	600	600	PY	Paraguayan	30	none
Guayibi	Colony office	Private	38 years	1600	1600	PY	Mennonite	40-50	none
Magagnin	office	Private	30 years	7000	6000	BR	Brazilian	50	
Curuguaty	Colony office	Private	birth	25-300		PY	Mennonite	20	Elementary

Table 2. Producer characteristics

laboratory and seed factory. An Indian reserve is part of the territory, and the firm also offers ecotourism. By contracting all machines, they are a great employer for the communities surrounding them, which creates a lot of loyalty towards the farm. Sustainability is the firm's strategy, according to Gloria Helman, the sustainability manager. A great deal is invested in good agricultural practices, social projects and certifications. The forest is certified by the Forest Stewardship Council for 'economically and socially sustainable ecological production' (www.payco.multired.com.py). The soy is ISCC certified, a certification for biofuels.

However, as the Oxfam report on Grupo DAP has also made clear, sustainability is not a clear path, it also involves learning from mistakes. For example, the company has tried to help the Indian community so they have something to produce and sell. But a frustrated sustainability manager recalls: *'Working with the Indians is hard, because they have such a different perception of time, they don't have that like we do. They also do not want to work. They are hungry, but don't want to do anything. Seeing how they live can be quite a shock. Their way of living is not compatible with modern life... I don't know what they want. They have very small*

plots with some things, but they don't even produce enough for themselves' (interview 04-03-2014).

The second largest company farm, Agro Ganadera 'Carla Maria' of 16.000 hectares, started with 1500 hectares of soy twelve years ago. Most of the farm is used for cattle raising, with large stretches of forest. The manager assured us that the farm was in harmony with nature, due to the large amount of wild animals present on the farm: from the fish in the streams to mountain lions, which are rare in Paraguay.

The largest privately owned farm is 7.000 hectares, owned by a Brazilian producer and owner of AgroForte Silos, which buys and sell grains. Adorned with a great deal of gold jewelry and in a lavish office, he spoke of the great potential in Paraguay and claimed that all was environmentally sound on this property. They have been using Precision Agriculture software for

Figure 10. A farmer driving past milk churns in Nueva Durango



three years, in which sensor software in a harvester makes maps of soil fertility for every one hundred square meters. He also trusted that his seven agricultural engineers would make the right decisions. Upon leaving the office, there were two armed guards outside, who accompanied him in a black SUV. He does business with Tranquilo Favero⁶ and is now being threatened, according to ADM staff.

The smallest privately owned farms, ranging from 25 to 150 hectares, belonged to a traditional Mennonite colony located near Curuguaty, called Nueva Durango. The people here dress traditionally in overalls and long dresses, and machines are only allowed for work purposes. The office, beside a large, well-stocked supermarket, was the center of the colony. We interviewed the agricultural managers, two shy young men in their early twenties. They, as many others in the colony, had only been to school until age 13. Once a person is literate and can do arithmetic, he is considered of working age.

⁶ Paraguay's 'king of soy', with 50.000 hectares. Especially notorious for unethical practices.

Excluding these outliers (the company farms, the largest and the smallest private farms), the average farm size of those interviewed is approximately 950 hectares. Some of the larger farms rotated beef with agriculture, but most were purely agricultural producers. A number of the interviewees did not own the land, but rented it. The rent depended on the contract, and varied from a percentage of the profits to 700 kilos per hectare per harvest (ADM staff, 24 March 2014). Renting land has a great effect on the profitability of growing crops.

Nationality

Figure 11. A Brazilian producer. Own photo



Concerning nationalities of those interviewed, twelve were Brazilian, four were Mennonite, and six Paraguayan. All of the Mennonites and three of the Brazilians were born in Paraguay. Even though these Brazilians are technically Paraguayan, they are still considered ‘foreigner’ by native Paraguayans. Of the company farms, three out of five were owned by foreigners – Portuguese/German, a Brazilian and a Venezuelan. These findings correspond with Eduardo Galeano’s analysis of the 2008 Agricultural Census, in which three of the visited departments have the highest rate of foreign control over large farms (above 1000 hectares): Caaguazú and Canindeyú’s large farms are 63% and Alto Parana’s 62% foreign owned (Galeano, 2012). Of the twenty-two interviewed producers, there was one Paraguayan who privately owned more than 1.000 hectares, and two Paraguayan companies who did.

The Brazilians and Mennonites are proud of their work ethic and of what they have accomplished. When the Brazilians came to the eastern provinces and the Mennonites set up their colonies⁷ there was nothing but forest, and life was difficult. They were true pioneers in these areas. Forty years later, this area is considered an agricultural powerhouse and the producers live well.

⁷ The interviewed colonies: Friesland in 1937, Volendam in 1947, Sommerfeld (near Campo Nueve) in 1948 and Nueva Durango in 1978

Education

Generally, the producers were not well educated in the formal sense: most have taught themselves what they need to know. At every silo, the model farms were visited: producers with a formal education and vision on sustainability. However, the majority of the interviewed producers were still barely educated, even if they are now well-to-do or even wealthy. For some wealthy heirs, not getting an education is related to their economic status – in their eyes, they don't need it anymore.

Figure 12. A farm manager in a ready to be harvested field. Own photo



In two visited Mennonite colonies, Friesland and Nueva Durango, it is felt that children only needed to learn how to read and write, and at age thirteen everyone should work. This results in the necessity to hire all expertise outside of the colony – lawyers, accountants and agricultural engineers, for example. Another result is lagging agricultural yields due to backward production methods (according to ADM silo staff in both Guayibi and Curuguaty, 28 March and 9 April). However, in the Mennonite colonies of Volendam and Sommerfeld, the education levels seemed to be higher⁸.

Most of the Brazilian producers are from humble origins. Their formal education, therefore, is also basic (and in some cases, non-existent). Despite the fact that there's room for better education, the Brazilian producer generally has an entrepreneurial mindset and invests in new techniques and machinery. They also realize the importance of a proper education for their children, and often send them to Brazil for this.

⁸ This could also be due to the fact that in Volendam and Sommerfeld, colony leaders were spoken to. In Friesland and Nueva Durango, farmers were interviewed. ADM staff warned that what the colonists think is often not the same as the leaders. In Volendam and Sommerfeld, education was important. In Volendam, sustainability played a large role in colony policies.

Chapter 5. Actor attitudes in the Paraguayan soy debate

The large scale production of soy in Paraguay is not unproblematic. In this chapter, the issues related to the production of the legume are divided into economic, environmental and social problems, according to the three spheres of sustainability. The producer's opinions on each topic will be elaborated, as well as the agri-business, government and NGO stances on each issue. This is based on interviews with each actor and complemented by literature. The objective of this chapter is to clarify the national discussion on soy, as well as the soy producer's opinions on these sustainability related issues.

Economic

Figure 13. Contribution of the agricultural sector. Source: *UltimaHora*, 10-04-2014



The largest economic issue with the soy sector in Paraguay is that it is extractive: the farmers and traders make money that is not redistributed into society, largely due to the dysfunctional tax system. An April 10th, 2014 article from *Ultima Hora* newspaper illustrates how low tax revenue is for the agricultural sector. The image to the left translates: IMAGRO, (the

previous agricultural tax), collected a total of 71.813 million Guaranies (currently: 16.2 million US dollars) in 2013. The agricultural sector contributed 0.91% to total tax revenue with 61.000 contributors. The article continues by explaining that last year, the sector contributed 15.9 million dollars in taxes, and exported 2.500 million dollars' worth of soy. The total agricultural tax is 0.64% of the soy exports (UltimaHora, 2014). Besides the low amount of collected taxes,

the low level of employment generated by large scale agriculture also does not aid in redistribution.

The producers know they don't pay a great deal of taxes, especially compared to the neighboring countries (Argentina has a 35% export tax, for example). The producers, however, are running a business, and obviously prefer to pay as little taxes as possible. An addition to this fact, the producers are quick to point out that their communities are semi-autonomous, as they arrange a great deal of public goods themselves. All farmers have indicated that they maintain roads and bridges in their areas, since the government does not do this. Many also support local schools, some even paying for the teacher. There is little to no government presence, and municipalities are often notoriously corrupt. Almost every single producer said he paid taxes, and he wouldn't mind paying more, as long as there was some kind of return. If you do not trust the money you pay in taxes will ever come back to your benefit, why pay? Now, there is no return, according to the producers. According to the UGP, the farmers pay enough taxes, and it is ridiculous for them to pay more (S. Cavazutti, interview, 10 February 2014).

However, the producers are only a part of the value chain. Multinational companies are careful of their image and hence will generally pay what is *legally* required of them. The Paraguayan tax system is so full of loopholes (the difference between arm's length and transfer pricing, for example) and tax exemptions that this legal amount is extremely low. There is also the fear that if taxes are raised for the multinationals, the producers will have to pay them (S. Cavazutti, interview, 10 February 2014).

According to the sector, the development of communities like Curuguaty and many others in the soy producing areas is due to soy funds. An argument frequently made by soy producers is that there are many good indirect effects, such as for the transport, construction and retail industry. In towns such as Campo Nueve (Doctor Juan Eulogio Estigarribia) or Curuguaty, this is clearly visible: there are machine dealers, banks, cooperative stores, silos, agro-chemical vendors – all geared towards the agricultural consumer. A short drive through Curuguaty demonstrates that all the national banks have offices here – a recent development, according to a producer from that area. The soy farmers fare well, building new homes and buying newest models of pickup trucks.

The government desires of the agricultural sector that they contribute at least 2.5% to total tax income, due to the fact that GDP growth has once again hit record highs (14% in 2013), that one

third or the tax exemptions and incentives are for the agricultural sector, and that the industry itself benefits greatly from the country – so they should do something in return (UltimaHora, 2014). Another argument frequently heard from the government side is that the government has more people to take care of, so maintaining roads for farmers who are well-off is not a high priority. They are able take care of themselves, while many in society are not able to do so (G. Ruiz-Diaz, interview, 12 March 2014).

On the NGO or civil society side, BASE-is propagates a return to small scale farming, as more people can make a living in that fashion, it would enable a better food intake, and would be better for the environment (L. Rojas, interview, 12 February 2014). Howard also supports the idea of recreating the agricultural model based on ‘cooperative, organic, and people-friendly alternatives’, calling the export industry a ‘poisonous green desert’. She concludes that that Brazilian and multinational owned lands need to be redistributed to small(er) producers, to ‘*to transform destructive industrial-export agriculture by following an “agro-ecological” model that will serve the Paraguayan people*’ (Howard, 2009). Déborah Itriago’s report for Oxfam does not go that far, but concludes that the loopholes in the tax system must be addressed in order to allow the country to meet its social objectives (Itriago, 2012). Roberto Codas, continent manager for Solidaridad, on the soy producers: ‘*they don’t have the right to say they do a lot for the development of this country. It would help a lot if the business case was educated. The business community here is limited and conservative because of ignorance*’ (R. Codas, interview, 23 April 2014).

Environmental

The discussion around large scale soy production often revolves around genetically modified crops, agricultural chemicals and deforestation.

Genetically Modified Crops (GMO)

95% of all soy grown in Paraguay is genetically modified (Guereña, 2013). As previously mentioned, weed resistance and increasing chemical use result in environmental and health issues. Among farmers, GMO is simply the way to produce. The sector promotes biotechnology as the way to advance agriculture and feed the world; those who are against are not well informed. There is no real discussion about GMO among farmers. As mentioned, GMO was

especially popular due to the ease in weed management, in spite of the current increased weed resistance. However, when pressed about this and the increased use of pesticides, which also costs extra funds, two producers said they were thinking about sowing conventional soy again. This was due to the fact that there are no differences in yields, chemical use is approximately the same, and because it would be good to use less glyphosate. Farmers who would like to switch to conventional will run into logistical issues however, as it is impossible to separate the GMO from the conventional harvests.

Horacio Cartes is a businessman, and hence the current government is more business minded.

Figure 14. A poster against GMO at the BASE-is office. Own photo.



With GMO being good for business and a proponent of GMO being current president of the SENAIVE, a logical deduction would

be that this government is pro-GMO. Within the government, there are obviously those with concerns, for example about the contraband GMO corn. With 13 native species of corn, this could be dangerous (SEAM official, interview, 24 April 2014).

NGO's are divided on the subject. Solidaridad and WWF, as pro-business organizations, are not actively against GMO, as it is the reality they must work with in Paraguay. BASE-is, and most other NGO's, however, are against. Native species will be pollinated and receive transgenic traits, making these

plants subject to the laws of international patents. Food sovereignty is thus endangered, promoting more rural-urban migration (BASE-is, 2010). Miguel Lovera, ex SENAIVE president and now with the Global Forest Coalition, says that GMO has a great many adversaries, for three main reasons: it is yet unclear what the effects are for the human body, there are large effects for the environment because producers need to use more and more chemicals to reach the same effect, and as an artificial genetic construct, they (can) have a great impact on the evolutionary process (M. Lovera, interview, 24 April 2014). Among others, Guereña's 2013 Oxfam report concurs with Bindraban's conclusion that the problem with GMO lies especially with herbicide use (Guereña, 2013).

Agro-chemical use

It is clear that one of the major problems related to the production of soy is the (ab)use of agro-chemicals, which has negative consequences for the environment and for the people living in areas near the soy plantations. There is a lot of controversy surrounding this, and the discussion also has a large social component.



Above, the pictures taken by depict campesinos protesting fumigation of a field, and the police force working as a human shield to ensure the farmer can continue. Below, two images demonstrate physical problems related to fumigation. Sources: Senator Luis Alberto Wagner via CEIDRA (above), presentation on agro-chemicals by CMI (bottom left), and Kregg Hetherington 2005 (bottom right).



Producers would always ask the same question on this subject: why is it that campesinos get ill from these chemicals, and we, who live right in the middle of our soy fields, and have done so for years, do not? Another commonly heard argument was the fact that small farmers fumigate

with a backpack, no protection, and with chemicals that are more toxic than those used on soy. How could it be that they are sick from soy chemicals? Glyphosate is *franja verde*, - rated green – the least toxic classification of the chemicals. An often heard story, by a respected member of the Campo Nueve Mennonite community: ‘*Glyphosate is not dangerous, but ok, maybe you shouldn’t drink it. But, I once was in the hospital when a man came in who had drunk some. My sister is a nurse there, she said he left and was fine. They say glyphosate is less toxic than the salt on your table.*’ (Producer, interview, 6 March 2014).

The same producer told a frequently heard story: ‘*Several years ago, I had planted a small field of soy and wanted to fumigate it, with glyphosate. The neighbors were campesinos and wouldn’t allow it. So I asked them what they put on their cotton – a franja roja product! Glyphosate is franja verde. But he said it didn’t matter, they only put 20 liters on their soil but I would be using 200 liters. They use their backpacks without protection, we have a machine and only fumigate under the right circumstances, even at night, if need be. So the problem is that they don’t know what they are against – they have no idea what they are doing*’.

In the producer discourse, the campesino is uneducated (or stupid) for thinking he is ill from soy chemicals, and they lie about the effects the fumigation has on their crops and on themselves. Glyphosate’s toxicity is reduced to that of common foodstuffs. The fact that there are vehement protests against soy, but not so with corn and wheat, is also not understood. These crops use practically the same chemicals. The complaints are thus often taken with a grain of salt, and many producers find it tiring: ‘*In Brazil, the producer is considered is someone who contributes to the country. Here it’s different, you are the sojero who uses too much agro-chemicals*’ (Producer, interview, 27 March 2014).

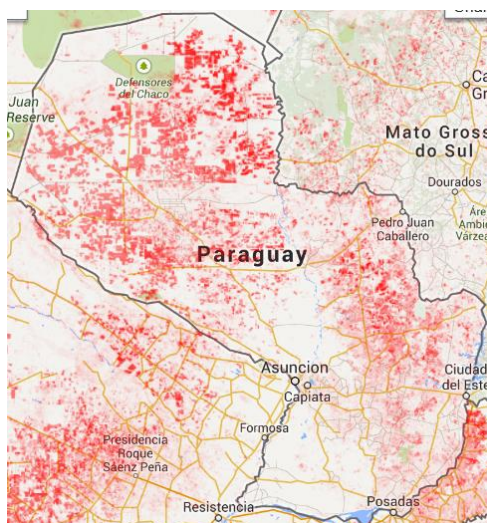
The industry denies that the agro-chemicals, if used correctly, cause damage. The UGP had a German firm test water in a disputed area, and the test results apparently came out clean. The allegations of contaminated water and soil are thus reduced to something environmentalists (who know nothing about agriculture) claim. The discussion on agro-chemicals is so sensitive, that the manager of INBIO denied there were any problems with agrochemicals at all (R. Pedretti, interview, 10 February 2014). While many complaints and issues are real, most producers believe the complaints about the chemicals are fake, in order to oust them. And sometimes, they are. Stories of producers spraying with water, after which the SEAM/SENAVE would receive

complaints of headaches or dizziness, abound. Or stories like this: *'I used to have a plane with which I fumigated. When I was done, neighbors would come and ask for the chemical containers, to use them for water. Once they pretended I had hit their manioc with it (the chemicals), but when this happens there are clear symptoms. But they had thrown hot water over the plants, the characteristic symptoms were missing'* (producer, interview, 03 April 2014).

Concerning the government, there is no official stance on this issue. It is clear that the SEAM does not have enough officials to enforce the laws on agro-chemical use. According to the vice minister of MAG, not putting more officials on this is not a question of the state not having enough funds, but of priorities. With a total of eleven officials monitoring all environmental laws in Paraguay, the conclusion can only be that this is not a priority of the Paraguayan government.

NGO's in Paraguay, but also in Brazil or Argentina are trying to raise awareness concerning the effects these chemicals have. They report about the small farmers that do not sell their land and find themselves surrounded by soy fields, experiencing the negative consequences of frequent fumigation. Water sources are polluted, their crops and animals die, many suffer from headaches and dizziness, there is a high ratio of malformed babies and cancer (see: Hetherington, Abramson, Howard, Guereña and BASE-is among others). In the previous chapter, it became clear that there are scientific studies confirming that glyphosate is not as benign as the industry claims.

Figure 15. Deforestation in Paraguay. Source: <http://earthenginepartners.appspot.com/science-2013-global-forest>. Map by Hansen et.al.



Deforestation

A large part of the Atlantic Forest in Eastern Paraguay was deforested under the agricultural colonization policy. The 2004 Zero Deforestation law helped to curb deforestation in this region, where most of the soy is grown. In the north of Paraguay, however, deforestation is now the highest in the world (Hansen et.al, 2013). The map on the left demonstrates deforestation in Paraguay from 2000 to 2012, with the Northern region clearly redder than the

Eastern region.

Producers feel unjustly blamed for deforestation which has happened a long time ago, under government approval. As Brazilian a producer in Curuguaty said: *When we started, you had to have 5% forest. The Mennonites also slashed everything. It's now treated as an environmental crime. Now, we are both reforesting. There is no forest here, but this is not a new thing, it was cut down 30 years ago* (producer, interview, 08 March 2014). Many producers have started to reforest, using eucalyptus or pine trees, which are both non-native species. However, they grow quickly and are commercially interesting, and as one producer pointed out: *'if we all plant native trees, what are we going to use?'* The trees are planted in rows, and harvested when large enough. As the producers are running a business, most hope the reforestation is an investment which will pay back, instead of planting trees to advance nature.

Not all producers agree with the zero-deforestation law. One producer told a story about how he got into trouble because the campesinos he had rented land to had cut trees. *'Only to clear the land, so they could grow crops and make a better life for themselves. A few trees are not a forest, right? I was helping them, they now have a better life. The only thing I want for them is to see the fruits of the earth when they work for it. Now, they have land and are doing well'* (producer, interview 06 March 2014). Another is purposefully reforesting too slow, because according to him it is not fair to go from a 5% requirement to 25% (producer, interview, 03 April 2014).

In NGO literature, soy is often pinpointed as the sole reason for the rapid decline of the forest in Eastern Paraguay. However, as pointed out in the previous chapter, while soy plays an important role in deforestation, it is usually indirect. Soy often moves onto pasture land, which is an indirect cause of the deforestation in the Chaco. The ranchers are 'pushed' out of the East, as they can sell their land for a high price, and buy cheaper land in the Chaco.

While deforestation in the Oriental has been curbed, it has still not been stopped. Most of the producers claim to have stopped cutting trees, because this causes instant trouble with the SEAM. However, deforestation in the Oriental is not difficult to find. When visiting a campesino settlement in Alto Parana, almost all houses had an oven to make charcoal with. Many were burning. Where did the wood come from? On several other occasions, a truck would be parked on the side of the road, in the dark, and be loaded with trunks. Poverty, a limited education, a strong demand for wood and very limited, corrupted government monitoring seem to make zero

deforestation impossible. A producer in Alto Parana said: *the government officials don't care whether you are complying or not, they just want money. And it's a lot, you could get a 15 million Guarani fine (for deforesting), and pay half to the official. Like someone is going to say something* (producer, interview, 01 March 2014).

Social

Social, environmental and economic issues are intertwined; hence the division used is somewhat arbitrary. The social situation in Paraguay concerns the position of smallholders, whose agenda obviously covers economic, but also environmental issues; and foreignisation.

The position of campesinos

The inequality in Paraguay is large, and the soy boom is exacerbating conflicts that result from this inequality. The difference between the modern and traditional agricultural sector in Paraguay is large. Unfortunately, these differences will remain the same or grow even larger, because 84% of the smaller farmers have no access to technical support, 87% have no access to credit, and 85% did not finish elementary school (H. Cristaldo, interview, 17 March 2014). Especially the lack of access to technical support and credit is important.

The land distribution in the country is the basis for many problems, and the 1990 soy boom also had a large effect on campesino communities. Many sold their land to bigger neighbors, enticed by the large sum of money. However, the one thing they knew how to survive off of was now gone, and many find themselves desperate after the money runs out. A producer said: *'they buy a nice little house in town, a new motorcycle and a phone, and sit in the yard drinking terere until they have nothing left, and then they come back.'* They do not know how to invest their new funds, and are not skilled laborers. Another producer: *About the land title thing – it's not the fault of the person who bought it, the other shouldn't have sold'* (producer, interview, 04 April 2014).

As has become clear, the colonization strengthened the position of the land holding elite, but it was also an opportunity for a better life for many. A problem with the land distribution was that the government gave (and gives) land, but no further support. As a producer in Magagnin said:

the government gives land, and then no education, so the people don't know how to produce. The campesino leaders ask for land, but not for education. How can a country develop? The government just gives land to the people for votes' (producer, interview, 01 April 2014).

In Guayaibi we visited a campesino colony with a Brazilian producer. Each house had a decent sized plot of land, but much of it was lying fallow or had never been cleared at all. According to the producer, it is not just the fact that there is not enough government aid: *someone came here with your European mentality, that they only need more help. But after a few years he left, he also realized that it's not that, it's their mentality, they really don't want to work* (producer, interview, 03 April 2014). Every single producer spoken to, and especially ADM staff, referred to campesinos as lazy. One producer explained it like this: *'the problem is that they don't want to work. They try to make problems out of everything. After the Triple Alliance War, when there were almost only Paraguayan women left with their small children, they needed men. So they mixed with the Indians and created this 'rasa mala'* (producer, interview, 06 March 2014).

People have become so desperate for land that it is often 'occupied' or squatted on when it is not used or (supposedly) ill-gotten. In some cases, the government will appoint the land to the squatters. A settlement like this is the fear of every farmer in the country. A manager of a large, Paraguayan owned farm told about the 200 hundred families that set up camp on their land a few years ago. *'We were lucky, our accountant and the police showed them the paperwork proving that all the land was legal and then they left, I don't know where to. But what can you do, if they stay?'* (Producer, interview, 26 March 2014). Besides the fear of a settlement on their land, a frequently returning accusation was that several campesinos were professional squatters, occupying land until the government granted it to them, selling it after a few years, and then moving to another area to repeat the process. One producer said: *'They are supposedly campesinos sin tierra, but actually they often do have land. They will invade land, cut the trees and then sell it for carbon. And plant banana trees, to make it look like they have been there for a while, so it's harder to get them off – bananas are ready green in two weeks. They just come and take your land, sometimes as an owner it's really hard, what can you do?'* (Producer, interview, 06 March 2014).

While simple on paper, the campesino and modern agriculture have different discourses, which are not compatible. According to agri-business, campesino culture is more focused on the day to

day necessities (as Simona Cavazzuti, UGP representative explained: *'in Latin America, we have an expression: 'mañana es para mañana'. In Paraguay, mañana doesn't exist'*.) Modern agriculture sees production from a more entrepreneurial point of view. The producer does not understand his campesino neighbor and appoints negative characteristics (lazy, does not know how to invest, lies) to him, deflecting from the real issues at stake.

Many NGO's work to improve the smallholder's situations. According to BASE-is, the production model of large scale agriculture, in particular soy, is not compatible with traditional rural life. Where one model dominates, the other has to go. This is the reason for the conflicts between large land owners and social movements, which has grown increasingly violent (BASE-is, 2010). Most campesinos and campesino organizations state that sustainable soy is impossible. According to them, the Roundtable for Responsible Soy greenwashes agri-business and legitimizes the existing environmentally and socially destructive practices of soy expansion (CEO, 2009 and Holland et al. 2008 in Garcia-Lopez 2010). Between 2003 and 2010, approximately 18.000 families moved from rural to urban areas. The government should prioritize agriculture with industrialization, and do more to distribute the large benefits from soy production (BASE-is, 2010). Land reform is also often demanded (such as in Howard, 2009, for example).

As previously described, the government has policies that try to improve the position of smallholders, but these have not been very successful.

Foreignisation

A last issue concerning soy production is the large amount of foreigners, especially Brazilians, who dominate the industry. Of the 1,000 hectare or larger farms in the Alto Parana, Caaguazu and Canindeyú departments, approximately 63% is foreign owned (Galeano, 2012). In 1991, 14% of farms 1000 hectares or larger were foreign owned, in 2008, this was 24% (Galeano 2012). During the colonization period, many Brazilian farmers came with their families to the departments on the Brazilian border, especially in the departments of Canindeyú and Alto Parana, searching for cheaper land and more opportunities. The Mennonites came from Canada, Russia, Mexico and Germany for a number of reasons, most involving their desire to practice their religion in freedom and the quest for land. Many came during the 1920's and 1930's and were granted various rights in exchange for colonizing the inhospitable northern area, or the

Chaco. While they are viewed as odd, they are generally respected for their work ethic and social principles.

In Paraguayan society, it has not gone unnoticed that many large scale soy producers are foreign – or of foreign descent, as many were born in the country. As the media and NGO discourse is predominantly negative concerning soy, it is easy to blame it on the ‘foreigners’, in this case especially Brazilians and to a lesser extent the Mennonites. Luis Rojas of BASE-is indicated that according to him, the resistance to large scale soy production is also a cultural resistance: ‘*there are so many foreigners here, owning the land, exporting the soy – they do it differently than Paraguayans would*’ (L. Rojas, interview, 12 February 2014).

This is something most Brazilians actually agree with, but in a different sense. While the Brazilian producers understand that Paraguayans have trouble with their numbers, they don’t understand that Paraguayans themselves don’t make better use of the opportunities in their country. Brazilian producers are very enthusiastic about Paraguay, and nearly every producer showed a You-Tube video with many of Paraguay’s merits (see <https://www.youtube.com/watch?v=qJ06wUtSIA8>).

While there is a law prohibiting foreign ownership of land within 50 kilometers of the border, the government under Cartes does not seem to be very bothered by the Brazilians. On the contrary, President Cartes urged a Brazilian delegation from the Industry Confederation to ‘use and abuse’ Paraguay, as there are many beneficial opportunities in the country for them (among others: UltimaHora, 2014).

Conclusion

This chapter clarifies the attitudes of the producers and the three actors towards economic, environmental and social issues. The producers and agri-business are on the defensive side of this debate. As has become clear, there is a great deal of criticism on their livelihoods. It must be kept in mind that the producers own businesses, and they and their families are dependent on the income generated. Hence one of their prime interests remains profit maximization.

From the above, it has also become clear that the government is not playing a very active role in resolving these issues. While there is new agricultural tax (Chapter three) that should redistribute the earned soy capital in a better fashion, the question remains whether the funds will reach those

that need it most. Furthermore, due to lax environmental legislation and monitoring, issues with agro-chemicals and deforestation cannot be solved or mediated by government bodies. Lastly, this institutionally weak government also experiences great difficulty in executing policies that are beneficial to the campesino population. The non-governmental organizations strive to create more awareness for the above issues, propagating different solutions.

Concerning the exclusivity of soy production, the producers are convinced of the national benefits they bring. The soy producing regions have developed economically, and the producers providing employment for their neighbors. Continuing with the environmental sphere of sustainability, farmers do not understand resistance to GMO. They claim glyphosate is not dangerous, that they are careful during fumigation, and that campesinos fake illness because they are against soy. Furthermore, they deforested because the government told them it was good for development, but now many are reforesting. Lastly, concerning the social sphere, the campesino way of life and their struggles are not understood and are met with little sympathy by the producers. Since most of the producers are Brazilian, they do not see it as a problem that so much land is owned by foreigners, but do understand the resentment.

These are the recurring arguments used by the producers to defend themselves. They know of the criticism, but do not seem to be interested in it. For example concerning the claims of illness related to fumigation, producers claimed this was not true, yet none seem to have looked for objective information concerning this (by visiting affected neighbors, or doing research online). They are not interested in criticism, and seem to ignore it, instead of trying to find out where it comes from and if the other party might have a point. The theory of cognitive dissonance states that humans will always strive for internal consistency. When there is dissonance, besides trying to reduce it, people will 'actively avoid situations and information which would increase the dissonance' (Festinger, 1957). So according to this theory, the producer's reactions are a natural response to criticism on their way of life and beliefs.

Chapter 6. Producer behaviors towards sustainability

Now that it has become clear who the producers are and what their attitudes towards the main issues in the soy debate are, their behaviors towards sustainability can be explored. As stated, sustainability is operationalized into three spheres. The economic sphere is about future and recent investments, the social sphere concerns relationships with (campesino) neighbors and employees, and the environmental sphere regards the knowledge and application of good agricultural practices (GAP) and environmental legislation.

Economic: Future and recent investments

Are the soy producers in Paraguay focused on long term production? One of the first interviewees claimed that the Brazilians would use land for a short time, and then leave again. It wasn't their country, so why would they care how they left the land? This sort of insinuation was common.

However, the interviewed producers are in the agriculture business for the long term, regardless of their nationality. Some even cleared their own fields, thirty to forty years ago. Most have had their farms for a long time, starting small and expanding, and continually investing in machinery, technology and more land. One farmer, with only 500 hectares, had just bought two new machines, worth 80.000 dollars each, at the fair. Because he had quite sandy land, this investment would take a while to repay itself. However, the same producer and his wife said it was their dream to buy land in Brazil, so they could move there when they retired. Their sons were both studying agriculture, so they could take over the business (producer, interview, 09 April 2014).

Almost every farmer wanted to expand, either by buying more land or by being more productive on the current amount of land. As one producer who rented his land said: *'if I had my own land, I would invest in a pivot, because there is so much insecurity with the weather. Now we are diversifying towards cattle ranching and intensifying the soy production'* (producer, interview,

07 April 2014). Intensification, or raising production on the same amount of land, is often done by using better technology – from seeds to precision agriculture, with which sensor software in a harvester makes maps of soil fertility for every one hundred square meters. The producers realize that land is a finite commodity, and there is no new frontier (until now, the Chaco is not suited for soy production). Especially in very fertile areas, such as in Itapúa, land has also become relatively expensive. So simply using land, selling it and then buying new land is very difficult in the soy producing areas. Another producer indicated that he also wanted to diversify, because *‘the big companies are not giving us the opportunity to add value’* (producer, interview, 26 March 2014).

Another factor relating to the long term plans of the producers is succession. While not enough data is collected concerning this, several sons of the producers were at university, studying agriculture. We also spoke to the heir of a 1900 hectare farm. He had dropped out of university ‘because he doesn’t need it’ – and materially, he is right. Where his father had especially focused on increasing the acreage, he was interested in technology to improve productivity (producer, interview, 02 April 2014). Another producer said: *‘I want my children to have a happy life, but am more worried about my grandchildren. How will the world be for them? So I am thinking about a business that just generates income, that you wouldn’t need the land for’* (producer, interview, 06 March 2014).

The farms that are owned by companies could technically be sold quickly, as they are only part of the company’s investment. However, these are usually the most technically advanced farms visited, with pivots, silos and/ or precision agriculture, meaning that the investment in the farm is not meant for the short term. Pivots were rare, however, even in areas with irregular rainfall, due to the high investment: \$4.000 per hectare (producer, interview, 02 April 2014). The investments and long-term vision of the producers and companies are positive for the sustainability of the sector, as they will have to protect the land to be able to continue production in the next years.

Social: relationship with employees and campesino neighbors

It is now clear that the producers do not understand the campesino way of life and that their struggles are met with little sympathy. Every producer has campesino neighbors, usually a short drive from his home. The differences between their lives are quite large, as producers have access to the technology and credit they need, while campesinos lack this. The relationship between campesinos and producers could be characterized by mutual distrust: campesinos fear loss of their livelihoods and contamination due to agro-chemicals, and the producers worry about land occupation and theft. The conflict can become violent.

Many producers tell about problems they used to have with their neighbor campesinos, and how it is now solved by setting up projects to help them. These projects are considered a wise investment. A producer in Guayibi said *‘the directors of the campesino organizations make the problems. They came to visit me and told me I should use different agrochemicals, but I use franja verde products! They are the ones using products that we big producers don’t use anymore, like chlorpyrifos. We helped the local school by building a toilet for them’* (producer, interview, 25 March 2014). ADM personnel said he never experienced problems after that. The Volendam colony director lost a great deal of cattle to theft, and many hectares of corn right before the harvest. Now, he says: *‘We have a long term project with technical assistance. Everyone can decide for themselves what they want to grow, and we will give them credit. They sell their harvest and we get the credit back. We never have any problems getting the money back’* (producer, interview, 26 March 2014). The colony also helped set up a small cooperative for the small producers, which failed due to internal conflict and ‘infiltration from outside’. A large producer in Guayibi said they help their neighbors by providing machines and technical assistance for sowing and harvesting. A problem in this, according to him, was that the neighbors now did nothing – they only sold their grains and paid part of the harvest to him. But it kept the peace, so he continued with it (producer, interview 26 March 2014). Projects like these increase dialogue and loyalty on both sides, and seem to decrease problems.

Soy often causes internal conflict in campesino communities. Among others, a producer in Curuguaty mentioned the fact that several of his campesino neighbors were also planting soy. This caused problems within the community, because *‘some want to plant it, and others don’t’* (producer, interview, 08 April 2014). Another producer in Curuguaty said his neighbors solely

produced for themselves, but he rented land from them, and now *'they are conscious of the fact that they can rent out their land to earn a bit extra'*. He also mentioned that they did see quite a bit of messages against the soy producers on Facebook (producer, interview, 09 April 2014).

Staff often comes from the neighborhood, and is a mix of Brazilians and Paraguayans. It is nearly impossible to distill from interviews with the producers how the relationship with staff really is. Most simply emphasize that they are employing people, and that that is a good thing. A difficulty producers have is finding educated staff, so they are often trained on the job. *'We taught them everything because they knew nothing, not even how to drive a tractor! They can do everything now except harvest, that's something my son likes to do.'* Besides training on the job, however, employees receive no official training or courses, for example on how to handle chemicals. The producers had had to learn it all themselves, so they could teach it to their staff, they said. Concerning salary: *'Staff isn't paid well here. I pay 50.000, but 30.000 per day is what others pay.'* (Interview 27-03-2014). The 50.000 Guarani per day is still less than the 60.000 Guarani (€10.50) minimum day wage. So the employees are generally not paid what they should be paid. Paraguay has a social security system called IPS (Instituto de Prevision Social). Many said they had signed their Paraguayan staff up for it, but if there were to be an accident, they would take them to a Brazilian hospital or a private clinic, as the IPS hospitals were so bad.

Environmental: Good agricultural practices

Most producers did not know what the term Good Agricultural Practices (GAP) meant, yet were familiar with the separate indicators. The indicators are based on the Round Table for Responsible Soy standards for responsible soy production.

An important part of maintaining soil quality is fertilizing it, or adding nutrients to the soil that are not present. If a producer knows exactly what and how much his soil needs, he will create optimal conditions for growing and save money by not adding unnecessary nutrients. Oldham and Crouse of Mississippi State University call soil analyses the *'original best management practice'* (2011); it is a small, but very worthwhile investment. Ideally, the soil should be tested after every harvest, but it also depends on the weather, soil type and number of harvests per year (Dutch expert, personal communication, 16 June 2014). Only one farm tested the soil after every

harvest. The majority was evenly divided between once a year and once every two years. Two farms used Precision Agriculture software, one producer indicated that he had it but didn't use it. A producer in Magagnin said *'if you don't have money, you aren't going to invest in soil analyses'* (interview, 02 April 2014). This captures the general sentiment of most producers. Unfortunately, this makes little sense business wise, and means that the soil is either not receiving the nutrients it needs, or has too much.

Every producer spoken to, and the majority in South America, uses conservation tillage, which leads to a better soil cover by plant residue. There are also problems associated with conservation tillage. Depending on the type of soil, there is a risk of soil compaction and increased soil acidity, and pests and diseases can survive in the plant residues, leading to a higher use of pesticides. This is something the producers were aware of. Besides this, conservation practices have made farming possible on land that was previously unsuited for agricultural purposes, such as erosion prone slopes and wetlands. Conservation tillage, therefore, can promote farming on previously natural lands (Bindraban et.al, 2009). This is not something the producers think about, or are aware of.

Preventing erosion and rotating crops are also important elements of soil management. Where necessary, farmers prevented erosion by making their fields slightly terraced. Conservation tillage also prevents erosion, and sometimes crops are planted just as coverage, like oatmeal (avena). The rotation of crops has been discussed previously. However, when the countryside was visited, it was not soy season, yet there was a lot of soy. So after the soy harvest in January/February, it is common to replant at least part of the fields with soy.

Another RTRS standard is maintaining an administration of used chemicals, on paper or digitally. Besides this being a good agricultural practice, it is also a very logical business practice – keeping track of inputs so you know how much your profit costs⁹. One farmer said *'I use experience for this. If you have an employee who does not have una buena cabeza (a good head), then you have to write it down.'* Some indicated that they send receipts to their accountant for the taxes; others said they had a list required by the SENAIVE. Only a small minority had a proper list, with dates, doses etc. A manager of a farm that used a management system indicated that a

⁹ With an average farm size of 950 hectares and average input costs of 500 US dollars per hectare, the total input costs are \$475.0000. Yet there is hardly an administration of these costs.

reason that most farmers do not register their inputs is because they also need to invest time in doing so, to figure out how it works, for example (producer, interview, 26 March 2014). Most indicated to *prefer* not to use *franja roja* products, however, if the pests were bad enough, they would. Most also said that the chemical containers were recycled, often a company would come pick them up. However, the quality of recycling companies differs, and also a positive bias on this question is very likely. It is common knowledge that burning these containers is ‘not done’, so they would not tell this to a stranger or to ADM staff.

Concerning the fumigation itself, every producer said no special training was required. They did it themselves, based on experience, or taught their staff. The only training and certificate required is when transporting the chemicals on trucks. It is also officially required to wear a protective suit, gloves and a face mask when fumigating. However, on tractors with closed, air-conditioned cabins, it is difficult to see the necessity for this and in the summer heat, most employees simply find it too much of a hassle. All producers said they adhered to the fumigation laws – so no fumigation with wind speed above 10 km/h, temperatures above 30 degrees or humidity above 60% (Volendam, 2013). However, with summer temperatures reaching above 40 degrees and the average humidity being higher than 60% (<http://www.weather-and-climate.com>), this might be impossible.

While not knowing what Good Agricultural Practices means, most farmers simply apply these practices out of common sense. However, as soon as an extra investment is required, many farmers decide against it. A producer said: ‘*We are here to earn money. You have to see the reality in Paraguay – if you can’t earn money with it, it’s not going to happen*’ (producer, interview, 27 March 2014). What many fail to see is that investing in GAP will pay itself back.

Environmental: Adherence to and knowledge of environmental legislation

Knowledge of environmental legislation is very low. Most know that an environmental license, 25% forest and protective barriers are necessary, but further details, such as when the license must be renewed, are unknown, especially under Paraguayan producers. The larger Brazilian Mennonite producers were fairly up to date, but this also seemed to be due to discrimination by the authorities. According to several Brazilian and one Mennonite producer, foreigners have to

be more careful and are checked more frequently. As one Brazilian said '*we don't want to give them (the authorities) a reason to come, so we just follow the rules*' (producer, interview, 02 April 2014).

It is almost impossible to measure adherence to environmental legislation, due to low knowledge levels on the producer side, lack of practical experience on my side and interview bias: these producers want to make a good impression. Most had an environmental license, albeit expired, as it is necessary to obtain credit. However, having the license itself does not say much about the environmental sustainability of the farm, it is a mere formality. The renewals are not monitored, a worsening of the situation or not following up on previous recommendations is not a reason to withdraw the license.

All were up to date on the 25% forest rule. Not all had 25% forest, but most were working towards it, by reforesting with pine and eucalyptus. While understandable that the producers have difficulty giving land back to nature and thus wanting the trees to be of some use, the true ecological benefit of eucalyptus plantations is questionable.

Another law specifies the need for planted barriers alongside public roads, water sources and between fields and neighboring communities. Almost all said they adhered, but also many expressed their displeasure with these laws. Such as the manager of a large farm: *In Holland, agriculture is also considered something beautiful, no? For tourism? Here in Paraguay, everything needs a barrier, to make sure you don't see it.* As barriers alongside roads also caused accidents, that law was retracted. While driving around in rural areas, it is easy to see that these laws are not adhered to on a large scale.

Due to a mix of low education and poor government communication, knowledge of the laws is uncommon. The importance of some laws is also not clear to producers. As most also believe that glyphosate, for example, cannot contaminate water, why should the water sources be protected by plant barriers? Paraguay's environmental laws are adhered to as minimally as possible, to avoid trouble with authorities and with campesino neighbors.

Conclusion

It is clear that sustainability is not an issue for producers. Previously, it became clear that the average large scale soy producer in Paraguay has a low level of education, and some who have been successful also feel that they don't need it. This especially seems to affect views concerning sustainability. Those who were slightly more educated were more open to new technologies and practices which both improved profitability and sustainability. For most, however, sustainability is not an issue. They had never thought about it. A Mennonite farmer with 1600 hectares from the Friesland colony said: *'My father did it this way and it works, why would I change it?'* (Producer, interview, 9 April 2014). A Brazilian farmer, one of nine children, from a poor immigrant family, said: *'Solo pienso en hoy. Mañana es para mañana'* - I only think about today, tomorrow is for tomorrow (producer, interview, 27 March 2014).

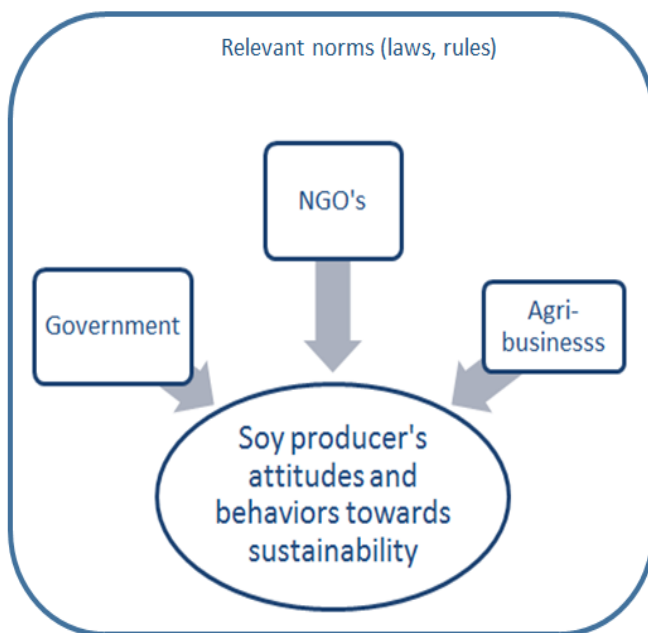
Being businessmen, economic sustainability, however, is important, as producing soy is their livelihood. Investments in new technology are supposed to increase production, now that land prices are rising and most fertile land is occupied. Almost all producers spoke of trying to intensify their production, yet Good Agricultural Practices are not commonly used, while these practices are absolutely cheaper than buying a harvester with Precision Agriculture software, for example. Regular soil analyses, or keeping a proper administration of inputs are often considered too big of an investment for the return, while an outsider would consider these normal business practices. Status could very well have something to do with this, as new machines show the neighbors how well you are doing, but soil analysis is only for your own benefit. Environmental laws are not understood and also not something the producers occupy themselves with. They are adhered to as minimally as possible, especially by the foreign producers, to prevent trouble, but not because of a desire to produce in an environmentally sound way.

The producers do not understand the campesinos and belittle their problems, yet help their neighbors to avoid trouble. In this sense, the campesinos have forced their larger neighbors to set up projects to further social sustainability. Many also employ a few neighbors, often a mix of Brazilians and Paraguayans. By helping the neighbors, the producers are not admitting to be part of the problem; they are trying to make the problem in their direct environment go away. This aligns with the cognitive dissonance theory as discussed in the last chapter, as the producers will try to reduce the discrepancy between their views and those of their critics.

Chapter 7. Origins of producer attitudes

In the previous chapters, the producers were introduced, as well as their attitudes and behaviors towards sustainability. Based on empirical results, it has become apparent that sustainability is not an issue for the producers. The objective of this chapter is to examine *why* these are their attitudes. The results in the previous chapters will be interpreted with the aid of institutional theory.

Figure 17. Conceptual model.



The conceptual model as described in Chapter 2 shows the three actors that influence producer's attitudes and behaviors. As also described, the attitudes of soy producers towards sustainability are an institution because it is 'a norm of behavior that structures repeated human interaction'. Institutionalism considers how these attitudes become norms; how do they become the ground rules for social behavior? According to Granovetter, social structure must be taken into account when considering

(economic) institutions. So the influence of each actor on the producers will be analyzed, including their interests and leverage on the producers.

Influence of the government

When asked how the government influenced them in their production practices or daily running of the farm, most producers were a bit startled, and had no idea. The Paraguayan government is not or hardly present in rural areas, and when the producers were inspected, a story of how corrupt the official was almost always followed. All complained about the lack of proper infrastructure.

Previously, clientelism was defined as ‘the direct exchange of a citizen’s vote in return for direct payments or continuing access to employment, goods, and services,’ (Kitschelt & Wilkinson in Hicken, 2011). Stroessner and the Colorado party created a ‘rural patronage system’ with the implementation of the land agency (Hetherington, 2009), now the INDERT, which distributed land during the agricultural colonization period. Land was given away in exchange for votes, but when Stroessner failed to reform as promised, rural opposition led to his downfall (Hetherington, 2009). Despite this, the Colorado Party is still very much supported by the rural population. The largest group of voters in Paraguay is still poor, and desperately needs a government that will stick up for them. However, the promises made during election time are rarely kept, even in Lugo’s case.

Due to the extent of the corruption in Paraguay, it is fair to say that there is a prevalence of personal over national interests in the government. This means that on average, the primary interest of those in the government is to gain personal wealth. This is also reflected in the World Economic Forum’s competitiveness report, in which public trust in politicians ranks 145th out of 148 countries, favoritism in decisions of public officials 143rd, and wastefulness of government spending 142nd.

It has become clear that the Ministry of Agriculture (MAG) is failing to implement policies to alleviate the situation of the large group of smallholder farmers. However, the larger farmers also complain of a lack of governmental support. Especially the Brazilian producers complain that there is no information on new agricultural developments, for example. In their eyes, the government does not do enough to stimulate research or new development in the modern sector, such as developing new seed varieties. As one producer said: ‘*In Brazil we had a type of seed 20 years ago, but here they were still studying it until last year. So the government keeps us back, and the seeds get imported as contraband*’ (producer, interview, 27 March 2014). The research and new developments have been taken over by the private sector, which means that objective news or reviews are difficult to come by. Education on more simple things, such as good agricultural practices, is also lacking. The ministry has close ties to the National University, but there are no public education or awareness programs.

Furthermore, the Secretary of the Environment (SEAM) has a great lack of institutional capacity. There is practically no (environmental) law enforcement. The Vice-Minister of Agriculture said:

There is very little control on the use of agro-chemicals. There are only a few laws, nobody complies because nobody checks, if nobody checks, no one can be punished'. According to him, the lack of control was due to weak government institutions and weak political will, and not a lack of funds (M. León, interview, 22 April 2014). This, however, is of course a vicious cycle: as little as possible funding is granted to SEAM, who then cannot hire (enough) capable employees, which is demotivating.

Besides not being able to do proper monitoring and control, there is also no or little communication concerning new or changed laws. For example about decree 453, which recently adjusted the Environmental Impact Assessment law. A producer on the EIA and SEAM: *'I have been producing soy in Paraguay for 20 years... Since 8 years, I have an environmental license. I believe I have to renew it every 2 years, or maybe 5. I have no idea. The SEAM doesn't come to do controls here, I have never had a government official on my farm. The government is not present in this area. Only police, wanting money for their 'services'. They come a lot'* (interview, 25 March 2014). While many farmers have accountants who tell them this, not a single farmer knew that now it had to be renewed every 5 years instead of 2, or that farms under 500 hectares do not need the assessment. On the other hand, this information is easily found in national newspapers and vocational magazines.

In an ideal situation, the government maximizes the welfare of the entire population, pursuing the public interest. To do this and ensure a proper market functioning, the government should provide public goods, redistribute income and provide a legal system, among other things. Due to these measures, profit maximization is constrained, in exchange for a better environment or food safety, for example. Due to the high level of corruption in Paraguay, the government's role is distorted, as it does not pursue the public's interest, or at least only a part of the public. Public goods, such as infrastructure, social security or safety are at a very low level. The tax system does not work, as it does not redistribute the wealth created by the primary sector to those who need it. Lastly, with a judicial independence that is nearly the lowest in the world and also a very low protection of (intellectual) property rights (World Economic Forum, 2013), it is clear that the legal system is also dysfunctional.

There is a lack of communication, education and monitoring from the government towards rural areas, and hence a lack of presence. The government influence on soy producers is based on this

absence, creating an environment in which the agri-business sector can almost do as it pleases. Profit maximization is thus hardly constrained, and in some situations even stimulated (Cartes' remark that Brazilians should 'use and abuse' Paraguay's opportunities, for example). The producers are influenced by a government that fails to fulfill basic government tasks and is focused on personal gain. The governmental attitude, in which financial gain has become the norm, is thus of great indirect influence to the producers. If the government is not acting in a responsible way, why should citizens?

Through subsidies (gas is subsidized) and laws, for example the new tax laws, there is also some level of direct influence. However, again due to the high corruption levels, the government is not taken seriously, because it is usually easier to simply pay off an official. These costs are considered a cost of business by the producers.

Influence of agri-business

Agri-business is powerful, not only in Paraguay but also in the rest of the world, as Khan (2012) describes. In Paraguay, the multinational trading companies have the geographical advantage that the country is landlocked, making the producers dependent on them to transport their grains to seaports.

Agri-business' main interest is to earn as much as possible: profit maximization. This interest is defended by the lobby groups, including UGP, CAPECO and CAPPRO, who use their rhetoric to convince people that they are right. The media is used to promote this, such as in the case of the two articles in ABC Color by the UGP, titled '*12 arguments to get rid of Lovera*'. Lovera was president of the SENAVE under Lugo, and was critical of GMO. According to the UGP, he was against modern farming. Twelve arguments were listed, including the fact that he had harmed national interests by forwarding his own opinion instead of the government's at a biofuels conference, that a fee was (supposedly) illegally implemented, and that he visited a climate change conference in Cancun, while that did not belong to his tasks. The real reasons for agri-business to have him discharged are not mentioned.

A lesser known example concerns the opposition of the lobby organizations against article 8 of Act 2048. These articles are used to influence public opinion, especially the producers.

Article 8, Act 2048/2004 specifies that producers who are going to fumigate need to notify those in the vicinity of the field 24 hours by a local radio announcement. In a statement published by UltimaHora, the president of the producers association (APS) states that this is impossible to comply with. All agricultural produce needs phytosanitary care, but now every time a producer goes into the field, he needs to notify the neighbors. The lobby organization thus openly rejected an already accepted law (UltimaHora, 2011). While producers were not up to date on the law (some said they had to notify their neighbors three days in advance, for example), everyone knew the APS had rejected the law. This rejection stimulated the producers to ignore the law.

The large companies are a major source of information for the producers. Besides the articles in the media, various salesmen come by on a weekly basis, with news and gossip from the industry. They provide technical assistance and organize meetings in fashions that aid the sale of their products, for example seeds and pesticides. Besides this, how representatives of the companies speak - the agri-business discourse - of issues surrounding the production of soy, such as campesinos or the abuse of agro-chemicals, is a major influence on the producers. Their large scale farms are feeding the world, and bio-technology is necessary to do so. The difference in opportunities and culture that exists between the modern and traditional sector is justified by claiming that campesinos are lazy and ignorant. Campesinos fake illness from the chemicals; there is no contamination from the chemicals and there is no deforestation due to soy (H. Cristaldo, interview, 17 March 2014). The lobby and the companies are busy promoting the advantages of bio-technology and modern agriculture; those who are against this are not well educated in their eyes. This is the main influence of agri-business on the producers, who continuously receive confirmation that what they are doing is OK, and that they should not listen to criticism (which is mostly from people who have no idea how the sector works).

Sustainable practices will only be considered if they fit within the interest of profit maximization. And since there isn't a financial incentive, sustainability is generally not an issue for the sector. Certification, for example, is one way to increase sustainability, but producers make a loss on certified soy, as what they sell it for does not cover the costs. Traders maintain that they cannot sell it for higher prices, and that the demand is too low (ADM trading manager, interview, 26 February 2014). The industry thus has no incentive to view itself critically and see that there is room for improvement.

Agri-business has a large influence on the government through friends in important government positions and through a powerful lobby. Agri-business' goal of profit maximization is met by those in the government who strive for the same; there are not enough checks and balances. However, different than the government, agri-business has found a variety of (semi) scientific arguments to justify their way of doing business. For example the fact that soy is not responsible for the deforestation, but cattle ranching; or that glyphosate has such a low toxicity and is thus not dangerous. Together, these arguments form the current discourse. Those that question this discourse are dismissed as uneducated or people that 'understand nothing of agriculture', rendering a real debate impossible.

An advantage of Paraguay for agribusiness is the previously illustrated weak institutional capacity of the government, which makes it easy for the industry to influence the government. The soy lobby has made grateful use of this possibility, firstly by placing friends of the industry in key positions, such as the SENAVE president, who was former president of the soy lobby APS. With people in important legislative positions, it is easier to pass laws that the industry can benefit from, or to approve new seed varieties, for example. Secondly, the industry can use its knowledge to be of influence, for example when the government asks for advice on related subject, such as the phytosanitary laws. In Paraguay, practically all those with an agricultural degree come from the Universidad Nacional, which is in favor of large scale agriculture and agri-business. While it would go too far as to say the industry has a knowledge monopoly, it is very concentrated.

As mentioned, the few taxes and laws are monitored poorly by the government. Attempts to change laws or to heighten taxation are met with large protests from the industry. Elgert describes how President Lugo's attempt to increase the export tax to 6% was met with *simple refusal*, with industry representatives calling it '*an absurd form of intervention*', saying that '*Paraguay has great potential and could be a big food producer for the world, but this could slow the sector's development*' (Elgert, 2012).

Summarizing, agri-business is a powerful force in the debate on soy. Their main interest is profit maximization, and this interest is defended by lobby organizations which have developed a convincing series of arguments. The producers hear these arguments on a weekly (or daily) basis, which confirms their belief that their livelihoods are beneficiary to the country and the world.

Due to the interest of profit-maximization, sustainability is only interesting if it can add value. Lastly, agri-business also has quite an influence on the government, through people in key governmental positions and by using its knowledge on subjects related to agriculture.

Influence of NGO's

In contrast to the government and agri-business, NGO's prime interest is not profit maximization. Focusing on values and beliefs (Bendell, 2000), they are critical of current systems and will hold up a mirror to governments, businesses and consumers. The primary interest of many NGO's is to create awareness concerning the environmental dangers related to soy production, the inequity in the current system and the situation many smallholders are in. In Paraguay, as all over the world, there is the distinction between 'pro-business' NGO's which strive for strategic alliances with businesses, and the 'fundamentalist' NGO's, which have a more confrontational or antagonistic strategy. The NGO's discussed – Solidaridad, WWF and BASE-is – do not have direct contact with the producers.

BASE-is, as a confrontational research institute, is focused on smallholders and is against the business model of both the big companies and the producers. They strive for land, opportunities and food security for campesinos, and as mentioned before, sustainable soy is impossible according to them. The agricultural system should return to a system of small, traditional producers, which would increase employment opportunities and make production more sustainable. So in their ideal view, the large, modern producers will be redundant in the future. As mentioned, this NGO does not have direct contact with large producers, so most producers are not aware of their existence or of their message.

The lobby organizations, however, are aware of their existence, and are also familiar with their reports. This results in the producers hearing of these reports and viewpoints through agri-business, if they hear about them at all. The viewpoints of BASE-is are so counter intuitive for the producers, that they are almost immediately dismissed. According to the producers, the current large scale agriculture, with its use of machines and technology, resulting in increased yields, is the way to develop. They see the benefits in their communities, and for themselves. Being against GMO is ridiculous in their eyes. And according to them, everyone can become a

modern farmer, if only they work hard enough. Did they not also come from humble backgrounds? Campesinos have no interest in this, and thus are lazy. What would come of the development of the country, if it was left to campesinos?

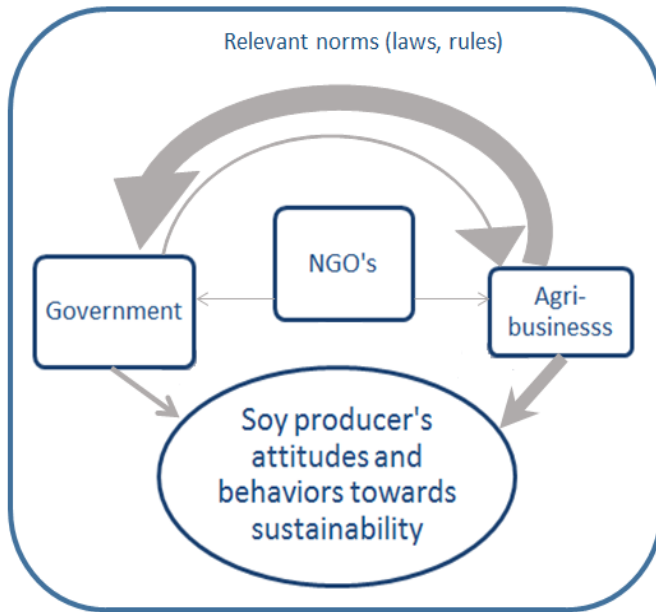
Reports from organizations like BASE-is are frequently discussed in the media, and influence public opinion. Due to this, the general opinion in the capital is often quite negative towards soy production. The producers, however, feel they are often too negatively depicted in the reports or newspaper articles that they read, and that normal farm/ business practices are not kept into account. This leads to an additional disregard of most of the NGO message that producers hear.

WWF and Solidaridad do not fight the current system, but have forged strategic alliances with agri-business, in the hope of generating an impact. The businesses see the necessity of being able to show the public that they are at least doing something towards a more sustainable sector, and thus cooperate within their interests of profit maximization. This limits the results of the NGO's in one way, while in the other helping them gain access to the producers. For example, a management system like Rural Horizons is brought to the producer via agri-business, which lends it credibility (in the producer's eyes). This is a strategy that could be used to forward sustainability.

So the NGO's have an indirect influence on producers via agri-business. There is an additional indirect influence through the government. NGO's try to influence legislation, for example for stricter laws on fumigation or in the case of the legalization of GMO corn (Monsanto was allowed experiments in 2011, patented it in July 2013, and one strand was legalized in January 2014, via Reuters, UltimaHora and ABC Color). Like agri-business, NGO's can also use their knowledge to influence legislation.

In short, NGO's have no direct influence on the producers, because the focus of NGO's is not directly on the producers. As NGO strategy does not include rural presence, influence is indirect, through agri-business or the government. This means that NGO values and beliefs theoretically only reach the producers if it aligns with the interest of profit maximization of either agri-business or the government, but then there is also the public debate in the media. Since NGO influence on producer attitudes towards sustainability is indirect and diffused, it is difficult to state what the specific result on the attitude is. A conclusion could be that these organizations fail to reach their goals of raising awareness on sustainability.

Figure 18. Final conceptual model.



Conclusion

From the above descriptions of the influence of the government, agri-business and NGO's on producers, it has become obvious that the conceptual model as depicted in the introduction of this chapter can be more precise. The level of influence that each actor has on the producers varies greatly; it is thus not the level playing field as pictured. It is more like the model left, which demonstrates the level of influence each actor has on the producers, but also of the actors on each other.

Agri-business has the most influence on both the producers and on the government. The government has a smaller influence on the producers and agri-business, by its laws and regulations. There is also an indirect influence caused by the government's absence in key areas, such as the provision of public goods. A last change in the model is the fact that NGO's have no direct influence on the producers, but that their influence works via agri-business and the government.

The above model shows how the producers are influenced by each stakeholder. Above, it has become clear that the key interest of the government is personal gain of those in the government, agri-business is interested in profit maximization and NGO's want to further their values and beliefs. The government influences the producer by its absence, which means that profit maximization in society is not limited and negative secondary effects of production are not accounted for. Furthermore, if the government does not act in a responsible way, why should the producers? Agri-business is only interested in profit maximization and uses rhetoric, via the media and salesmen, to convince the producers that they are helping develop Paraguay and feeding the world; they are doing it right. While the NGO strategy of working through agri-business and the government to reach the producers might work, it remains unclear what their influence on producers really is.

Conclusion

Twenty-two of ADM's suppliers in Paraguay were interviewed about sustainability relating to their livelihoods. The attitudes of the soy producers toward sustainability were clarified in the context of the debate on soy in Paraguay, which includes topics such as the exclusivity of soy production, the use of agro-chemicals and GM soy, deforestation and the position of campesinos. Their behaviors towards sustainability were operationalized based on 'on farm' actions, such as the use of Good Agricultural Practices. The research results – the attitudes of these twenty-two soy producers toward sustainability – are explained with the aid of institutional theory.

Large scale soy producers in Paraguay plant approximately 1.000 hectares of soy, are from Brazil and do not have a high level of formal education. While their farms are now large, most started as small businesses and gradually grew. Most of those interviewed were around fifty years old, had families and live comfortably. They take pride in their work. As businessmen, their key interest is to earn as much as possible.

Although the producers are well aware of the criticism on their production methods, they are not truly interested in the reasons behind this criticism. Often they ignore it or deflect from it (for example by saying that campesinos fake illnesses related to the agro-chemicals), instead of investigating the basis for these claims. If they do feel the need to defend themselves, they use recurring (semi) scientific arguments that originate from the lobby organizations. There is thus reason to believe that the large scale soy producers suffer from some form of cognitive dissonance. The theory of cognitive dissonance states that humans will always strive for internal consistency. When there is dissonance, besides trying to reduce it, people will 'actively avoid situations and information which would increase the dissonance' (Festinger, 1957). In this case, what the producers believe in and their way of life is criticized (the dissonance). Seen in the light of this theory, the producer's reactions are a natural response to criticism on their way of life and beliefs.

Concerning the behavior toward sustainability, almost all producers are intensifying their production now that land prices are rising and most fertile land is occupied. This generally occurs with the help of technology such as a new variety of seed or Precision Agriculture software. Good Agricultural Practices, however, are not commonly used. They are often

considered too big of an investment for the return, while an outsider would consider these normal business practices. Status could very well have something to do with this. New machines show the neighbors how well you are doing, but soil analysis is only for your own benefit. Another tactic towards economic sustainability is staying out of trouble, for example with minimal adherence to environmental legislation, or setting up a project to help campesino neighbors. This way, neither the government nor the neighbors cause problems. By helping the neighbors, the producers are not admitting to being part of the problem; they are trying to make the problem in their direct environment go away, which is also a characteristic of cognitive dissonance.

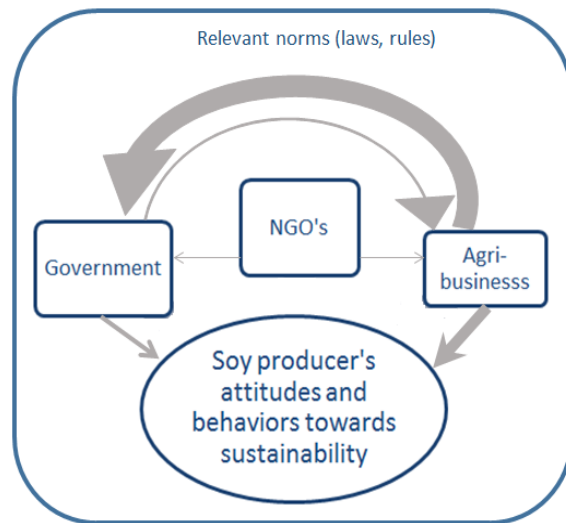
The attitude of the producers towards sustainability is thus generally non-existent. It is not something that the producers care about. To further explain the research results, institutional theory is used. According to Granovetter, social relations are important when analyzing institutions. The three actors – agri-business, the government and NGO's – influence the producers' opinions.

Agri-business has the most influence on both the producers and on the government. The key interest of the government is personal gain of those in the government. This matches the key interest of agri-business: profit maximization. The large companies are a major source of information for the producers. National media is a big outlet for the discourse from the lobby organizations. The company representatives come by on a weekly basis, with news and gossip from the industry. This discourse, from both the media and the agri-business representatives, is a major influence on the producers, who constantly receive confirmation that what they are doing is good for the development of Paraguay.

The government has an indirect influence on the producers caused by an absence in key areas. It is clear that the government is not interested in sustainability due to the lack of policy promoting sustainability and the low amount of funds allocated to government bodies such as the SEAM. The government does not limit profit maximization in society, which could be done by stronger monitoring of environmental laws, for example. The producers see the government failing in its key tasks, and not acting in a responsible way. If the government does not seem to care about sustainability, why should they? Due to governmental absence, the producers and agribusiness act in an institutional vacuum.

The goal of NGO's is to further their values and beliefs, in this case to take better care of the environment and improve the situation of the many smallholders in the country. NGO's have no direct influence on the producers, but they do via agri-business, the government and to some extent, also the media and public opinion. Agri-business may not promote sustainability towards the producers, but many companies are interested in working with NGO's to maintain a more sustainable image. While the NGO strategy of working through agri-business and the government to reach the producers might work, it remains unclear what their influence on the large scale producers really is. The analysis of the three actors leads to a renewed conceptual model, as seen on the right.

Figure 19. Final Conceptual model



The attitude of soy producers towards sustainability is a norm of behavior, or an institution. Institutional theory analyzes how the producer's attitudes towards sustainability became norms, determining how they behave. The norm for large scale soy producers in Paraguay is not to be concerned about sustainability. The attitudes of the soy producers are due to the combined influence of agri-business and the government, whose main interest is profit maximization. From these two actors, the producers are constantly receiving the message that sustainability is either not important (the government) and that what they are doing is not harming the environment or those around them (agri-business). Thus the producers' attitude originates from the behaviors of agri-business and the government, whose interest in profit maximization stimulate the producer's cognitive dissonance.

For programs like Rural Horizons, these results mean that the NGO strategy of working through agri-business can be productive. Agri-business is interested in projects that help them maintain a good image. And as agri-business has the most influence on producers, producers will be more likely to accept these kinds of projects and programs. However, there is only a foundation for a system like Rural Horizons if it fits within the interests of agribusiness and the producers: profit

maximization. The system must have an added value to the farm, and if this is the case, ADM could have an advantage in binding customers to them.

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Appendices

1. Full interview
2. RTRS Standards
3. List of average chemicals and dosage per soy harvest

Annex 1. Full interview (in Spanish)

Nombre:

Nacionalidad:

Ciudad:

Educación: -

Superficie de la finca:

con soja:

hace cuantos años:

1. La producción de soja he cambiado mucho aquí, en los últimos años? Como fue antes, como cree que va a cambiar en el futuro?
2. Que es difícil en su trabajo?

Sustainability part 1 – Futuro y social

3. Piensa usted que puede continuar produciendo/ cultivando como ahora, y mantener buenas cosechas? Porque?
4. Que son sus planes para el futuro? Tiene usted un sucesor?
5. Como es tu relación con los vecinos? Son grandes o pequeños productores? Hay o había problemas con ellos?
6. Hay proyectos para ayudarles?
7. Que piensa usted de los campesinos y sus cuestiones?
8. Y con sus empleados y contratistas?
9. Que son los problemas más grandes, en la agricultura en general en PY, según usted?

Sustainability part 2 - Environment

Buenas practicas agricolas

- a. Hace análisis del suelo?
- b. Usa el siembra directo?
- c. Como esta evitando erosion?
- d. Como manejas el suelo?
- e. Hay un document o listo con todos los agroquimicos? Como? Cual agro-quimicos usa? Franja roja?
- f. Que hace usted con los embases?
- g. Hay problemas con agro-quimicos aquí?
- h. Hay algún protocolo que usa antes de fumigar?
- i. Hay habitación o entrenamientos para sus empleados que fumigan?

- j. Antes de fumigar, hay algunas cosas que tiene en cuenta? Como la temperatura o humedad, por ejemplo?
 - k. Que siembran sus vecinos?
 - l. Como optimizas la producción? Utilizas tecnología para eso, o es mas intuitiva?
 - m. Tiene problemas con resistencia antes soja RR? Todavía vale la pena para usar transgénico, según usted?
2. **Sustainability part 3 - Adherence to laws and taxes**
- a. Tiene licencia ambiental? Desde cuando? Se presenta
 - b. Tiene usted 25% bosque?
 - c. Y 50 metros franja?
 - d. Hace vacío sanitario?
 - e. Usa semillas registrada? Hace su propia semillas?
- 3. Que piensa de los leyes ambientales?
 - 4. Con que ley no estás de acuerdo?
 - 5. Hay algunos leyes que son mas difícil para cumplir? O mas caro?
 - 6. Como se informan sobre nuevos leyes o novedades agricolas?
 - 7. Me puedes decir si cumples mas o menos en la ley? Porque? Cual no?
 - 8. Un problema en Paraguay, según informes, es que la sector Agrícola no apoye el país, porque no pagan impuestos. Se exportan todo el valor agregado, también porque los dueños son extranjeros. Que piensa usted de esto?
 - 9. Que piensa del IRAGRO?

Influencia del Gobierno

- 1. Que piensas sobre el gobierno? Porque?
- 2. Y el SEAM? MAG?
- 3. Hay control o auditorias desde el gobierno? Y como son?
- 4. Como apoye el gobierno?
- 5. Como influye el gobierno (su maneras de) producción?

Influence of Agribusiness

- 1. Quien compra su soja? De qué depende eso?
- 2. Como es este relación?
- 3. También compras la semillas, fertilizantes etc con ellos?
- 4. Se financian usted?
- 5. Como influyen su maneras de producción?
- 6. Hay otros agro-negocios que son importante?
- 7. miembro de un cooperativo?
- 8. Como se ayudan usted?

Hay habilitaciones para empleados?

Si hay un sistema de gestión para mejorar todo y ser mas sostenible, eso te interesa? Algún aspecto especial?

Annex 2. RTRS Standards

Environmental responsibility

1. Effects of infrastructure are assessed
2. Pollution is minimized – no burning
3. Adequate storage for fuel, chemical containers etc.
4. Recycling
5. Soil quality is monitored
6. Restauration of natural vegetation
7. Expansion of soy cultivation is responsible
8. On farm biodiversity is maintained

Good Agricultural Practices

1. Quality and supply of surface + ground water is maintained or improved
2. Erosion is prevented
3. There is a plan for integrated crop management (ICM)
4. All application of agrochemicals is documented
5. Handling, storage, collection and disposal of chemical waste is monitored
6. No agrochemicals listed in the Rotterdam and Stockholm conventions are used.
7. Appropriate measures are implemented to prevent the drift of agro-chemicals to neighboring areas
8. Measures are implemented to allow coexistence of different production systems
9. Origin of seeds is controlled

Annex 3. List of average chemicals and dosage per soy harvest

Production costs of soy per hectare				
	Quantity per ha	Applications	Price per liter	Cost per ha
Seeds	55,00	1,00	1,10	60,50
Seed treatment (Insecticide)	0,11	1,00	44,00	4,84
Seed treatment (Inoculant)	0,17	1,00	23,00	3,80
Seed treatment (Fungicide)	0,11	1,00	8,00	0,88
Fertilizer (tons)	0,25	1,00	600,00	150,00
Herbicide (2,4 D)	0,80	1,00	5,00	4,00
Herbicide (Paraquat + Diquat)	2,00	1,00	7,80	15,60
Herbicide (Glyphosate)	2,00	2,00	8,50	34,00
Herbicide (Cletodyn)	0,40	1,00	12,50	5,00
Insecticide (Benzoat)	0,05	2,00	270,00	27,00
Insecticide (Teflubenzuron)	0,12	1,00	50,00	6,00
Insecticide (Tiametoxan)	0,20	2,00	64,00	25,60
Insecticide (Imidacloprid)	0,40	1,00	16,00	6,40
Fungicide (Azoxystrobin)	0,30	2,00	67,00	40,20
Fungicide (Solatenol)	0,20	1,00	180,00	36,00
Adherente	0,50	1,00	4,30	2,15
Desecante	2,00	1,00	6,00	12,00
Gasoil	60,00	1,00	1,20	72,27
TOTAL				506,24