HOW TO INCREASE THE COMPETITIVENESS OF SMALL SOY FARMERS IN PARAGUAY

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ABSTRACT: *Soybean is today the most traded commodity in the global market. Soy is a plant of great importance to human nutrition, animal feed and industries. Based on research efforts conducted in the main soy producing region in Paraguay, the study aimed to characterize the agents involved in the national soy industry and present an overview of the relations between them, particularly between business companies and farmers, with emphasis on small farmers. Emphasis will be given to contractual relations and how they impact the activity. The results indicate that contractual arrangements, formal or not, are tools that contribute to stable relations between the parties, especially in a business so dependent on exogenous factors, as is the case of agriculture. Therefore, it is crucial that the public and/or private organizations encourage the use of contracts to reduce costs and keep the agents in the productive activity.*

KEY WORDS: *agro-industrial complex; contractual relations; scenario analysis.*

JEL classification: *F10; Q11; M11; L11.*

1. INTRODUCTION

Soybean is today the most traded commodity in the global market. Soy is a plant of great importance to human nutrition, animal feed and industries. Nearly 60% of the food products contain ingredients from soy. The main products are soy oil and

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protein ingredients for multiple uses. Integral soybean is also used for several purposes.

Due to its wide range of uses, production has been increasing continuously. In 2010 global production of soy was approximately 250 million tons (USDA, 2010). In Paraguay, agricultural production is of huge economic and social importance and, in this context, soy is the agricultural product that contributes most to the country's Gross Domestic Product (GDP). Based on data from CAPECO (Cámara Paraguaya de Exportadores de Cereales y Oleaginosas – Paraguayan Chamber of Grains and Oilseeds Exporters) and the World Bank (2010), soy contributes to about 15% of the Paraguayan GDP. The country is the third biggest producer of soybean in South America and the sixth in the world (USDA, 2010), as shown in Table 1.

Table 1. Ranking of the world's largest producers of soybean - 2008/2009 (million tons)

EUA	Brazil	Argentine	China	India	Paraguay
80.54	57.00	43.80	16.80	10.00	6.50

Source: Own compilation based on information released by USDA (2009)

In 2010, over 2.5 million hectares were cultivated with soybean in Paraguay, which represents an increase of more than 130% over the last ten years (CAPECO, 2010). Average yields have been approximately 2,700 kg/ha. In the last five years average, about 70% of the production was exported in the form of grains (USDA, 2010). It is also worth noting that 45% of the Paraguayan soybean culture is dedicated to the cultivation of genetically modified soybean (INBIO, 2009).

Based on research efforts conducted in the main soy producing region in Paraguay, the study aimed to characterize the agents involved in the national soy industry and present an overview of the relations between them, particularly between business companies and farmers, with emphasis on small farmers. Emphasis will be given to contractual relations and how they impact the activity.

2. THEORETICAL FRAMEWORK

2.1 Institutional environment

North (1990) emphasizes the role of the institutional environment as an important variable to reduce transaction costs, e.g. guarantee of property rights. With the purpose of analyzing the role of the institutions, this movement has focused on: a) investigating the impacts of changes in the institutional environment on the economic result: b) theorize about the creation of institutions (FARINA; AZEVEDO; SAES, 1997).

Institutions set the "rules of the game" in a society (North, 1990). Precisely, "institutions consist of informal restrictions (sanctions, taboos, customs, traditions and codes of conduct) and formal rules (constitution, laws, property rights)" (North, 1991, p.97). Coase (1937) emphasizes that the neoclassic results by efficient markets can

only be achieved when no transaction costs exist. When transaction costs are high, institutions start to have a key role in the process.

The organizations are the players and consist of groups of individuals dedicated to any activity performed with a specific purpose. Limitations imposed by the institutional framework define the opportunities and, therefore, the types of organizations that will be created (North, 1990). The agents of changes are businessmen, politicians or economic agents, the decision-makers in the organizations.

On the other hand, formal rules include, among others, law reforms, passing and enforcement of new laws; legal changes resulting from jurisprudence that changes the law institutions; changes of standards and codes by regulatory agencies; and changes in constitutional provisions, which change the rules that govern the development of other rules (North, 1990).

Moreover, institutional changes resulting from changes in informal restrictions, such as standards, conventions or individual honesty standards, occur much more gradually and sometimes unconsciously, as people develop alternative patterns of behavior consistent with their evaluation of the transaction costs and benefits.

Given a set of institutions in a society, Alston (1998) points out that the person will enter into contracts with raw materials suppliers to minimize the overall costs of transaction and processing. As a result, we have a variety of contracts in which the divergence between the components of costs of the transaction and of production appears. The institutional environment is seen as the *locus* of shift parameters that influence the decision about the organizational form of production to be used (Zylbersztajn, 1995).

Transaction costs arise when the multiple valued dimensions included in the transaction are measured and when executing contracts the information has high costs, and can be imperfect. Efficient institutions and organizations can reduce the costs of every transaction so as to achieve a larger portion of potential gains from every human interaction (North, 1990). Therefore, institutions may be inefficient when the transaction costs of political and economic markets, together with the actors' subjective model do not cause the economic system to move forward to more efficient results (North, 1990).

2.2. Contractual relations

The use of contracts to govern the sale of products and purchase of inputs guarantees that the price of sale and the goods purchased will be received by the parties. Given this, contracts respond to the transaction dimensions – frequency, uncertainty and specificity of the assets involved – which are influenced by the institutional, technological and organizational environment that surround private businesses (Mondelli & Zylbersztajn, 2007).

For Neves (1999), contracts incompleteness is due to five reasons: a) the terms in the contracts are ambiguous due to the faulty design of the contract; b) some possible important aspects are not considered, creating gaps; c) high costs for the preparation of more complex contracts; d) ex-ante asymmetric information; and e) ex-post asymmetric information. Silva and Borges (2010) conducted a study on the

contractual relations in the tobacco supply chain. According to the authors, the process begins early in the season when contracts are executed, by which the tobacco processing industries undertake the obligation to provide seedlings, seeds, agrochemicals and other inputs required by the tobacco culture, and technical assistance to the growers, besides submitting financing requests to the banks, endorsing them and undertaking to buy the production at the end of the season. There are also contracts entered into by the processing industries and the foreign market.

In contractual arrangements, the characteristics of the agents and transactions are considered. According to Zylbersztajn (2000), with respect to the agents, there is limited rationality in contrast to the hypothesis of full rationality (neoclassic approach), and opportunism towards actions that promote the achievement of quasi-revenues associated with the transaction, which can affect the institutions accepted by society. On the other hand, transactions identify the frequency of exchanges, uncertainty and specificity of assets, the latter being related to space or capital or human resources.

The Transaction Costs Theory (TCT) uses contracts as key elements of the transactions once the rationality is limited and the agents' behavior is many times opportunistic. According to Zylbersztajn (1995), there are three types of contracts: the classic one, whose nature is discrete or discontinuous with no links with later periods; the neoclassic contract, whose transactions refer to transactions with effects in the long run and, therefore, subject to arbitrations proceedings; and the relational one, whose objective is to maintain a negotiable and continued structure instead of seeking to maintain a complete contract.

2. METHODOLOGY AND STUDIED AREA

The study comprised literature review, search and analysis of primary data and field surveys in Alto Paraná District, Paraguay. Firstly, we conducted a literature review on the subject to characterize the agents and processes involved. Next, statistical data on the soybean industry in the region under study were reviewed to characterize the production environment and determine the main issues of the sector.

Later, forms were developed and applied to a sample of the participant agents, among them: farmers, agro-input dealers, cooperatives, financial institutions, transport and trading companies. Thus, the research study could be characterized as a multi-case study.

According to the literature consulted, a case study is generally applicable when you wish to obtain analytical generalizations, instead of statistical ones, which can contribute to a certain theoretical model. Research by means of case studies has been considered one of the so-called qualitative methods, characterized by a greater focus on the understanding of the facts rather than the measurements itself. Thus, it contrasts with the quantitative methods, which deal with the measurement of phenomena and are applied to broader samples (Lazzarini, 1997).

For this work, we opted for the multi-case study analysis because of its advantage of providing evidences inserted in the most diverse contexts, which makes the research as a whole more robust. However, the main limitations of such case

studies are the subjectivity of analysis and the inability to generalize conclusions (YIN, 1989).

Gil (2007) distinguishes the most usual data survey tools, such as questionnaire, interview and form. Questionnaire is a series of questions made by the interviewer to the interviewee, who answers the questions (when the interview is totally structured, i.e., with fixed questions, it is mistaken with the form), and form is the technique by which the respondent answers questions previously prepared by the researcher, who records the answers. According to Gil (2007), "because of being applicable to the most diverse segments of the population and permitting to obtain data that can be easily tabulated and quantified, the form is today the most appropriate technique used in opinion polls and market surveys". Finally, data were tabulated and analyzed with the purpose of outlining a profile of the soybean industry in the studied region.

3. RESULTS AND DISCUSSIONS

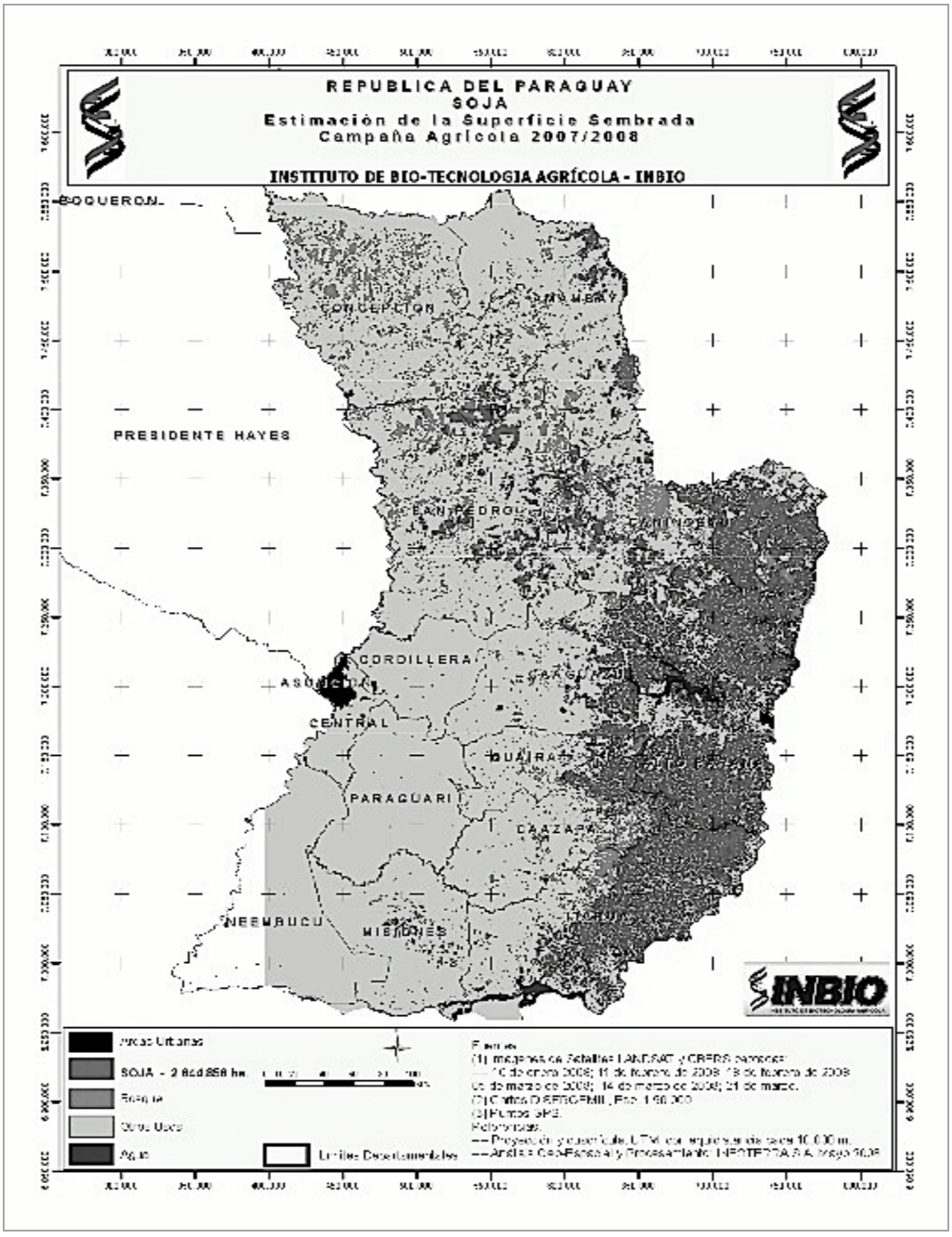
3.1 Agents characterization

The grains producing region in Paraguay is located in the eastern portion of the country (Figure 1), where climate and soils are appropriate to large scale agricultural production. This region has been colonized recently and most of the resident population settled in the 1970s, when the construction of the Itaipu power plant began and thanks to government agricultural incentives at the time.

In the eastern region of the country is the Alto Paraná District, which, according to data from CAPECO (2010), contributes to about 30% of the national soybean production and has average yields higher than the rest of Paraguay, reaching 2,940 kg/ha. The district is located at the eastern half of the country, where the edaphoclimate characteristics are favorable to the soybean culture, increasing yields and contributing to greater profitability of the business. It is worth noting that, according to estimates of the Paraguayan Government, 90% to 95% of the soy production is controlled by Brazilian immigrants, most of them coming from the southern region of Brazil.

As soybeans are the main export commodity of Paraguay, the fact that Brazilian immigrants control most of the production contributes to frequent conflicts between these producers and the Paraguayan peasants. This fact is aggravated mainly because Paraguay has about 40% of its population established in the rural area, a very high rate considering the increasingly urbanized standard in Latin America.

Therefore, the advance of soy crops into the most traditional peasant areas has had a severe social impact. Rising land prices make small farmers sell their properties to soybean companies. The money they receive is often wasted in unsuccessful attempts to start their own business in the city, because in general they do not have education and experience to conduct such activities and end up in low-skilled jobs in the cities for a living, which aggravates social inequalities and violence.



Source: INBIO (2008)

Figure 1. Distribution of soybean cultivation in Paraguay

The production of soybean in the country is concentrated in large properties. According to data from CAPECO, most of the producers own lands in the range of 200

and 1,000 ha, followed by producers with lands over 1,000 ha. The medium and large producers are technically equipped and have appropriate infrastructure for production. They have equipment in good working order, but regarding high-tech techniques like precision agriculture have not been used in large scale yet. However, small farms are characterized by having areas smaller than 50 hectares, by using low-tech equipment and agro-inputs, and, as a consequence, yields are low and therefore they cannot compete with the big producers. Such handicap contributes to a vicious circle, where, because of the lack of resources, small farmers become marginalized and subject to the power of the big players in the marketplace.

Regarding technical assistance and services, the farms are typically assisted by agronomists and technicians, most of them from cooperatives, traders and agro-input dealers. However, regarding small farms, effective technical assistance is not usual and is sporadic because of the lack of interest of the big companies and traders in serving small farmers.

The agro-inputs market is made up of medium and large size companies. If we subdivide this market, we have two main sectors: agrochemicals, which consists of big multinational companies – in general the same established in Brazil – and Paraguayan companies, mostly controlled by Brazilian immigrants. Another important sector of the inputs market is fertilizer, dominated by trading companies, followed by big companies and co-ops. Because the small growers are not the main target of these agents, they have to buy inputs from small companies, where quality and prices are not the same as those obtained by the big farmers. This is another factor that contributes to the small farmers' low competitiveness to cope with the big market players.

Regarding co-ops, there are 32 farmers' co-ops in Paraguay. Noteworthy is that most of the owners are Brazilian immigrants coming from the southern region of Brazil. In addition, there are cooperatives formed by Japanese immigrants, who have a significant share in the agricultural production in the region under study. This entire context makes the market for agricultural commodities one of the most concentrated sectors in the world, being dominated mostly by family, secular businesses.

To have an idea, grain trade in the world is concentrated in the hands of just five families (PINAZZA, 2007). In Paraguay, this reality is not different. Most of the Paraguayan soy trade is made by a small number of trading companies, which are transnational corporations with a strong presence in Brazil too. The four biggest trading companies operating in Paraguay commercialize more than 90% of the country's production.

3.2. Logistics: inputs, storage and transportation

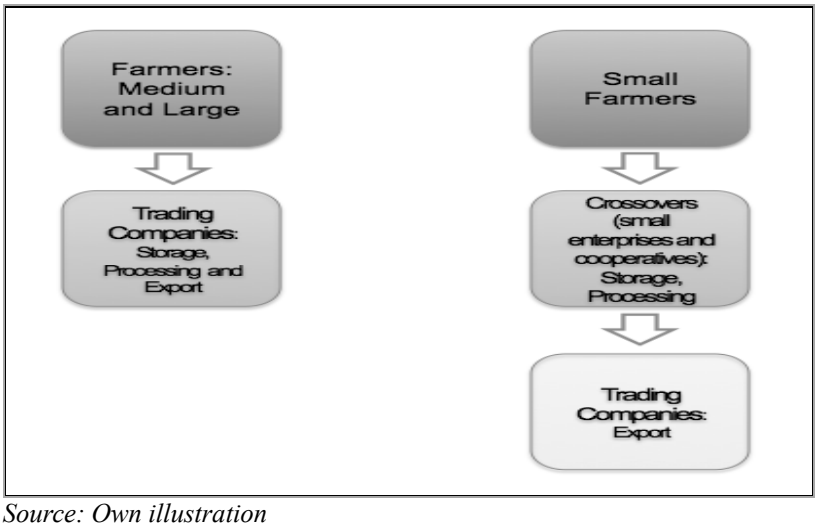
As mentioned earlier, the agro-inputs market in Paraguay is controlled by a few companies – traders, retailers and co-ops – and some agents play important roles in the market. The traders and some companies with high cash availability import inputs directly (agrochemicals, fertilizers, among others) and resell them to smaller companies, co-ops and farmers. In the case of agrochemicals, part is imported, formulated and then bottled in Paraguay, while another part is bottled abroad. These products come mainly from China and India and reach the American continent through

the ports of Montevideo in Uruguay and Buenos Aires in Argentine. Later, these products are transported by river to the port of Concepción, a city located at the left margin of the Paraguay River, one of the most important Paraguayan cities, with good port structure. From Concepción, the products travel by road to the soy-producing regions.

With respect to the storage of the crops, after leaving the farms the grains are transported by trucks to the storage facilities: co-ops, corporate middlemen or directly to the traders. In this matter, it is worth noting that the farms do not have their own silos, mainly due to the high investments required to build them. This is particularly true for small farmers: because they do not have their own storage facilities they are forced to sell their production quickly, especially during the crop peak periods, when prices are lower. According to the data collected in the survey, lack of silos is the result of lack of resources and credit lines to finance such facilities. Another important issue is that the storage companies and co-ops receive the products and store them at no extra costs to the farmers only until April 30 of the current season, and thereafter they bill $1.5 dollars/ton/month (prices in the 2009/2010 season for storing grains). In addition, they bill between five to six dollars per ton to process the oilseeds.

3.3. Soybean transportation routes from Paraguay

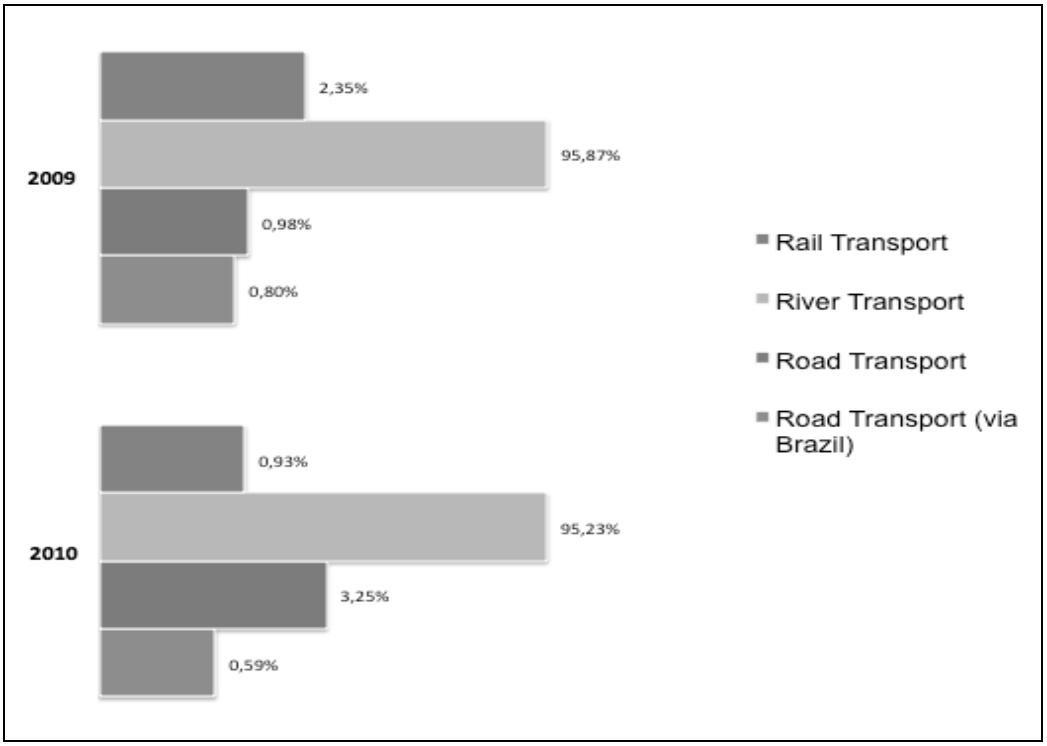
The soybean produced by the big producers leave the farms to the storage facilities, most of them owned by trading companies, and then are exported. Transportation in general is made by roads, which actually are in very inappropriate maintenance conditions. Soybeans produced by small farmers are transported from the rural properties to the corporate middlemen and afterwards to traders, in contrast to the big farmers who deliver their products directly to the traders, thus enjoying lower transaction and freight costs.



Source: Own illustration

Figure 2. Transportation flow of the soybean produced by farmers in Paraguay

Figure 2 shows the transportation flow of the soybean produced by small, medium and large farmers, where the presence of another agent in the small farmers' transaction can be clearly seen: the middlemen. This agent contributes to the higher costs that small farmers have, compared to those of the medium and large producers



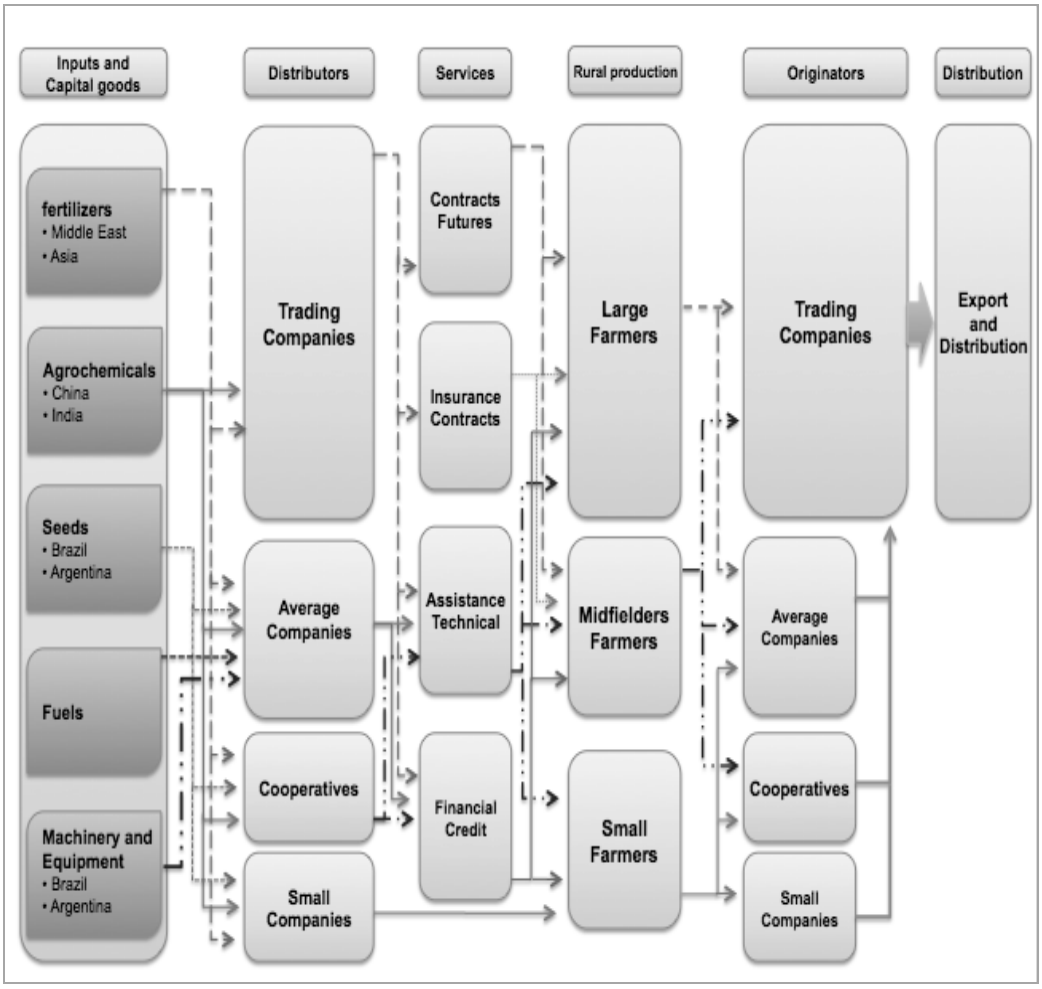
Source: Own compilation based on information released by CAPECO (2010)

Figure 3. Percentage of output of soybeans from Paraguay by point of embarkation logarithmic scale

From the exporters – the traders – the oilseed crop is transported by road or rail to the neighboring countries or to the port of Concepción, from which they travel from the Paraguay River to the Uruguayan and Argentine ports. Next, the grains are shipped to Europe or Asia in big vessels. Figure 3 shows the Paraguayan soybeans leaving the country by point of embarkation.

3.4. Mapping of the soy industry in Paraguay

Based on the analysis of the soy industry in Paraguay, it was possible to map the supply chain and identify the goods and services flow from the moment they enter the country until the commodity is exported.



Source: Own illustration

Figure 4. Conceptual framework of the soybean sector in the eastern side of Paraguay

Figure 4 shows the goods and services present in the business and the main agents involved. These data indicate that part of inputs – goods and services – pass through the trading companies, who have a key role in the current model of soy production in the country. Figure 4 clearly shows that the small farmers buy inputs from small and medium companies and transport their products by small or medium companies or co-ops. Afterwards, the products are shipped to the trading companies which are responsible for the distribution and exportation of the product.

3.5. Analysis of the scenario: contractual and problematic relations

Despite the importance of the agricultural production, mainly soybean, to the sustainable growth of Paraguay, there are problems with severe impacts on the business. Among these problems, it is noteworthy the deregulation of this sector. This

scenario contributes to the fact that a few companies control the market and, on the other hand, there are no credit lines available for agricultural production costs, especially for small farmers. It should be noted that the main problem that the farmers face is the lack of funding, a common fact to small and big producers. However, for small farmers the problem is much more critical. Prices fluctuations in the global market and the heavy dependence on traders are other major obstacles to the sustainable development of the soybean culture in the country. In particular, the small growers claim that credit is the biggest problem, because financing is practically nonexistent, and the private banks have high interest rates, around 11% to 12% per year. In addition, the traders – the main financing agents of the Paraguayan agriculture – are not interested in financing small farmers.

It was also noted that there has been is a serious problem of default on the part of the farmers. This happens mainly due to incomplete contracts between the parties, which contribute to increase the transaction costs. Such problems occur mostly with small corporate middlemen, which, although they now require guarantees to finance the products they still suffer losses as high as 10% a year. In addition, it was also found that there is no loyalty between the parties.

As for the larger companies, they claim that although they might have some debts refinanced, they do not have financial losses. This is because they only grant loans to farmers who hold title of land and enter into contracts where their property is given as collateral for the loan. They also emphasized that they haven't had any loyalty problems with the clients, as mentioned by the smaller companies.

Regarding losses caused by weather conditions, this is one of the threats of the business, because agriculture depends heavily on climate conditions, which, in turn, are considered exogenous variables. Thus, the agents involved seek for strategies that can minimize the losses caused by such events. However, for small farmers the situation is different because they have difficulty in contracting agriculture insurance. This is because their production scale is small, which makes them a less attractive audience to the insurance companies.

Taking into account that the major agents that promote and organize the soy business in Paraguay are the trading companies and larger companies, it is noted that all these organizations only grant credit, in money or inputs, to the producers that contract insurance coverage for the entire crop. Furthermore, public insurance is not available in Paraguay, and all contracts are made with independent insurance companies and/or insurers directly associated with the trading companies. This also contributes to make the access to insurance contracts more difficult to the small farmers.

Regarding the agents' relation issue, the communication between the companies and the farmers is made mostly by the field technicians – agronomists and agricultural technicians – who sell inputs and supplies, provide technical assistance to the crops and purchase the soy production. It is important to emphasize that these services are not billed directly because they are included in the products price sold to the farmers. In the case of small farmers, the contact between the field technicians and the farmers is more distant, because, as mentioned earlier, these farmers are not the primary target of the companies and, as a consequence, of technical assistance.

Additionally, the relations between the business agents – farmers and companies – in some cases come from non-contractual arrangements and in others from formal contracts. Noncompliance to the agreements (formal or not) sometimes occur, which contributes to the increase of the transaction costs, with direct impact on the entire soy sector, particularly on small farmers.

With respect to the contractual relationship between the agents of the soy agribusiness in Paraguay, there are particularities especially related to the size of the farmers business. The business relationship between the big producers and the companies is made by direct purchase/sale agreements. They are formal agreements with safeguards for both parties. The companies and big farmers also use futures contracts to minimize the risk of price fluctuations as well as agriculture insurance contracts.

In contrast, small farmers in general do not have contracts directly with the companies. Purchase and sale transactions are made with middlemen, which causes the transactions costs to increase in all dimensions. Furthermore, they are highly dependent on price fluctuations because they do not have future sale contract, as well as on climate conditions for not having agriculture insurance. All this makes that the agricultural activity becomes even more unstable for the family farmers, and to make a living becomes much more difficult, contributing to rural exodus.

3.6. Competitive strategies

In modern international competition, the companies compete with global strategies, involving not the international trade only but also management and logistics efficiency, risks control, and the ability to adapt to the economic environment. Competitive advantages include the concepts of segmented markets, differentiated products, technological diversities and economies of scale (PORTER, 1999). Aligned with these variables, the big players of the soybean business in Paraguay are using the most diverse strategies to become more competitive. Some examples are:

- Companies' verticalization. It is the case of some larger companies and traders that already have their own road transporting fleet, barges for river transportation, direct importation and sale of inputs, construction of fertilizer and vegetable oil plants;
- Efforts towards economies of scale to reduce unit costs;
- Control of climate risks by contracting crops insurance, without the need of intermediate agents;
- Control of prices risk by entering soybean futures contracts directly with Chicago Board of Trade. This future sale device is also largely used by big farmers, who sell at future contracts to ensure at least the coverage of production and marketing costs.
- Exchange rate control by means of dollar future contracts.

The strategies adopted by small farmers are quite different. If on the one hand the production and marketing strategies of big companies and farmers are well defined and structured, on the other hand small farmers face a quite different situation. They usually lack financial, human and organizational resources to plan production and sale

efficiently. In addition, they are not able to adopt the technological innovations as fast as the big producers, creating competitive disadvantages that make it much more difficult for them to make a living from the agricultural activity.

4. CONCLUSIONS

The agribusiness sector is highly complex: besides depending on production inputs and labor, it is also heavily dependent on environmental factors. These factors influence production and the commodity prices in view of the great speculation that exists in the agricultural market.

The situation of the small farmers is much more complicated. Added to these factors we can mention difficulty in accessing credit lines, dependence in relation to the big players, lack of political power and knowledge, mainly in management techniques. Based on the results, it can be seen that in increasingly competitive and globalized markets, which recurrently increases bureaucracy and transaction costs, small farmers need to adopt well-defined strategies, otherwise they may be forced out of the marketplace. Such strategies should make that these farmers gain in production scale and negotiation power. In this context, two forms of organization may help small farmers succeed in different ways in both these requirements, besides assisting them with the technical and economic management of the business. They are Cooperatives and Associations.

If both these forms of organization are well implemented and managed, all conditions to help small farmers to remain and succeed in the agricultural activities will be provided, and better, with life quality and conditions for a sustainable development.

Finally, it is important to emphasize that the contractual arrangements, formal or not, are tools that contribute to stable relations between the parties, especially in a business so dependent on exogenous factors, as is the case of agriculture. Therefore, it is crucial that the public and/or private organizations encourage the use of contracts to reduce costs and keep the agents in the productive activity.

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