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Globalization of Fresh Fruit Products: The Role of Public Agencies and the Transformation of the Petrolina-Juazeiro Valley

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1. GLOBALIZATION OF FRESH FRUIT PRODUCTS

The agricultural sector has recently changed in different aspects. One of such transformations has been a shift from the traditional model of family based production for local and national markets to a globalized agro-food system. Although international enterprises and foreign investments in the agricultural sector exist for over five centuries, food production and agricultural resource allocation have largely been linked at the local level. Presently, these decisions are increasingly addressed on a global scale (Le Heron, 1993; McMichael, 1993).

Fresh fruits became one of the most globalized products within the agricultural sector. The globalization trend has been facilitated by cost reduction in transportation, improvement in cold chain facilities, modernization of infra-structure, augmentation of middle classes income and changes in dietary habits. In addition, the growing importance of transnational corporations, both in the production sector as well as in the distribution chains, have propelled international trade of fresh fruit produce (Friedland, 1994).

Although long distance trade of fresh fruits are highly complex, considering that these products are perishable, it is estimated that roughly 10% of the world production of fruits are traded internationally, which means about 55 million tons per year. The international trade of fresh fruit has grown at an annual average rate of 3% in the last ten years (Rabobank International, 2007).

The world fruit production reached 690.8 million tons in 2006. China leads the ranking with 19.6% of the world production, followed by India with 7.9% and Brazil with 6.8% of the world fruit production. Then come the United States, Indonesia, the Philippines, Italy, Mexico, Turkey and Iran (FAO, 2008).

Together, these ten countries account roughly 60% of the world fruit production. However, there are other countries that have a higher market share of fruit exports. Due to the complex logistics involved in long distance trade of fresh fruit, part of the international trade takes place among neighboring or short distance countries. As a result, geography still plays a role in the commercialization process of these products, although long distance trade has increased (FAO, 2008).

The major exporters of fresh fruit are the United States, Spain, Italy, Belgium, Turkey, The Netherlands, Chile, France, Mexico, South Africa, Argentina, New Zealand, Ecuador, Costa Rica and Brazil. These countries are responsible for over 80% of the world fresh fruit exports which is estimated at US\$ 23 billion per year. The major traded fruits are grapes, apples, pears, bananas, melons, oranges, watermelons, papaya and pineapples (International Trade Centre, 2008).

There are three major firms in the global fruit distribution system. They are: Dole, Chiquita and Del Monte. These transnational agribusiness companies are present in a range of countries and they account for a great proportion of the fresh fruit international trade. Due to the globalization of fresh fruit products, national medium size firms and family farmers can take advantage of opportunities offered by the international fresh fruit markets as well. The smaller players can export directly to buyers in a foreign country or most commonly sell their production to a transnational corporation and thus export indirectly (Murray, 1998).

2. FRESH FRUIT PRODUCTION IN BRAZIL

Production of fresh fruits for export has grown in Brazil, and it is present in over 30 production hubs, generating income, jobs and boosting rural development. The Brazilian Northeast became one

of those hubs, where its fruit production and exports come mainly from three major irrigated valleys. In these areas, fruit plantations rely on a series of irrigation projects, where up to two crops are produced in a year-round. The production includes small-scale producers as well as commercial enterprises, covering nowadays about 500,000 hectares. As a result, these irrigated areas became major exporters of mangoes, table grapes, pineapples and melons, which are traded mainly to European and North American markets (Reetz, 2007).

Fruit exports have contributed to transform the afore-mentioned valleys: they have attracted producers, agribusiness firms, services companies, undergraduate schools, machinery and farm implement manufactures. Besides that, the job market has expanded in export-oriented valleys, as well as the diffusion of modern production technologies and marketing.

However, the transformation of the mentioned valleys into a focal point of fresh fruit production can not be entirely explained by the globalization of the fresh fruit value chain, nor can it be explained exclusively by the change in consumer's pattern towards an increasing consumption of "healthy food-stuff". This paper contends that the development of the fresh fruit hubs in the Brazilian Northeast are due to a long-standing government intervention through several public agencies that worked actively in these areas along with family farmers and private firms.

Through these agencies, the federal government provided public goods, such as investments in electric power plants, roads, irrigation infra-structure, extensive agricultural services, research and financing to family farmers and agricultural firms. The development of one of the irrigated valleys of the Brazilian Northeast, the Petrolina-Juazeiro, will be addressed in this paper along with governmental interventions in this area.

3. OBJECTIVES OF THE PAPER

The general objective of this paper is to analyze the fresh fruit value chain. The study focused on fresh fruit production and exports from one of the main Brazilian Northeast hubs, the Petrolina-Juazeiro valley. The governmental interventions are discussed, recommendations for policy makers are presented and the key lessons learned in the development process of such activities in the Brazilian Northeast are detailed as well.

4. METHODOLOGY

This paper deals with the production and globalization of the fresh fruit chain. It is emphasizing the production of fruits in a Brazilian irrigated valley, the Petrolina- Juazeiro. The study was conducted based on the rapid assessment methodology, a descriptive survey with a focus on the identification of the characteristics and the relationship of different key agents of the fresh fruit value chain in this valley. There was an emphasis on the development of the area, the role of public agencies and successful experiences (Guanziroli, Buainain and Filho, 2008).

The study was supported by qualitative methodology, identification and selection of target groups, those that gave information about fruits in order to support the proposals, strategies and lessons learned.

The survey was conducted in two steps. First, there was a bibliographical research about the fresh fruit value chain, through dissertations, periodicals and books. Second, interviews were conducted along with key actors working with fruits in the Petrolina-Juazeiro valley. The questions of the interviews were open, making it possible for the interviewers to get relevant information about the situation of the Petrolina-Juazeiro hub. The interviews were conducted in 2007.

The questions were focused on the characteristics of the firms, organizations, family farms and agroindustrial enterprises, technology, extension services, financing, training, marketing, institutional aspects and the sustainability of the projects. Public agencies, family farmers, firms, intermediaries and organizations were interviewed.

5. THE PETROLINA-JUAZEIRO VALLEY

The Petrolina-Juazeiro valley is situated in the Brazilian Northeast. The climate is semiarid and droughts are usual in this region. The valley comprises eight municipalities from two states, Pernambuco and Bahia, a total area of 53,000 km², population reached 690,000 inhabitants. Petrolina, situated in the state of Pernambuco, and Juazeiro located in the state of Bahia, are the main municipalities within this valley. The two cities concentrate about 85% of the valley's population and are separated by the São Francisco river (Map 1).

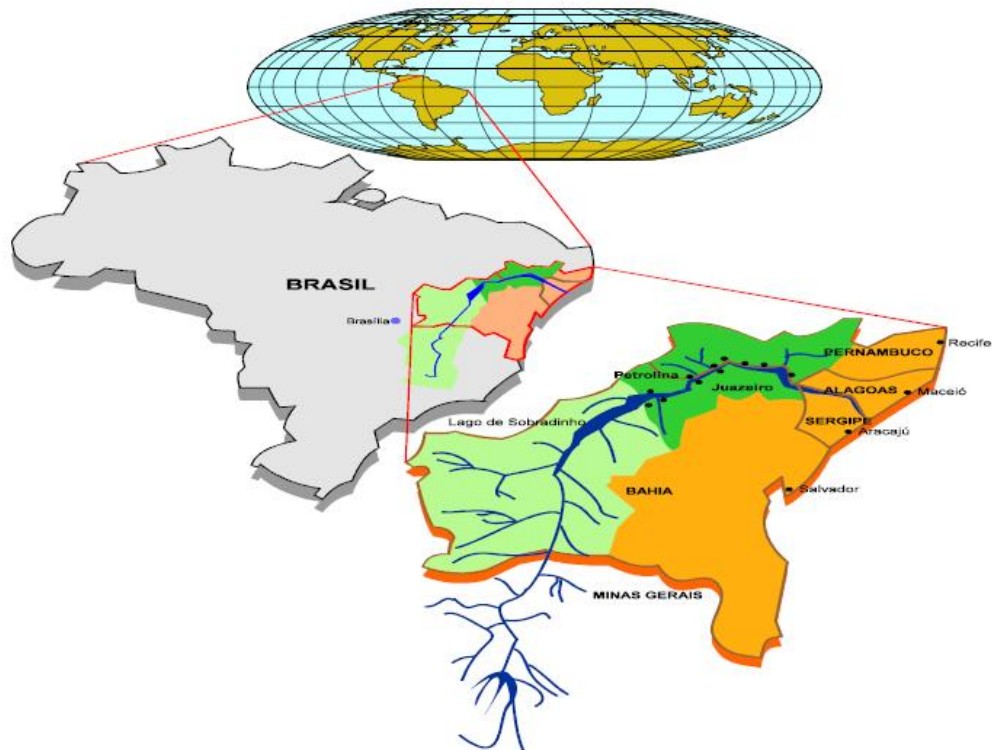
In the 1960s, the Petrolina-Juazeiro valley was characterized by low standards of living, based on traditional subsistence and low-productive agriculture and livestock, such as beans, manioc and goats. The production was destined entirely to the local markets and the land concentration was quite high (Damiani, 1999).

By the 1990s, the Petrolina-Juazeiro valley had turned into a producer and exporter of a wide range of irrigated high-value fruits destined to the international markets, as well as other cash crops for the domestic markets (Lima and Miranda, 2001).

How can this transformation be explained? The globalization of agriculture, including the fresh fruit sector, certainly helped to integrate the valley into international markets. The improvement of infrastructure services, reduction of transportation costs and the appearance of cold chain facilities facilitate long distance exports of fresh fruits. In addition, foreign investments from transnational agribusiness corporations, plus supermarkets and retail chains, facilitate the link between producers and consumers situated in distant places.

Income augmentation in developed and developing countries, creates the emergence of a middle class willing to pay for fresh foodstuffs, which have propelled the international trade of agricultural commodities as well. In addition, changes in dietary habits, including consumer preference for "healthy products" like fruits and vegetables have played an important role helping to raise the demand for such products (Whatmore, 1995).

However, the success of the Petrolina-Juazeiro valley can not be solely explained by the globalization of the fresh fruit sector or by the liberalization of the international trade regime. According to the interviews, the transformation of this valley is certainly related to the provision of public goods made from public agencies. These huge public investments started in the 1960s, and the main public institutions working in the valley have been the São Francisco River Basin Development Agency (CODEVASF), the São Francisco River Hydroelectric Company (CHESF), the Bank of Northeast Brazil (BNB) and the Brazilian Agency of Agricultural Research (EMBRAPA).



Map 1 – The Petrolina-Juazeiro Valley.

These agencies were created in the middle of the twentieth century, and their main objective was to promote the development of the country, particularly the Northeast Region. The federal government created two agencies to intervene within the limits of the São Francisco River. The first one was CHESF, created in 1948, with a focus on building electric power infrastructure. CODEVASF, created also in 1948, has worked to formulate a development plan for the São Francisco River Basin, which included the promoting of navigation, irrigation, agricultural and industrial development (CODEVASF, 2007).

The Bank of Northeast Brazil (BNB) became one of the leading development finance institutions (DFIs) of the Northeast region of Brazil. Established in 1952, the organization became a singular combination of a development agency, investment and commercial bank. The institution promotes technical assistance, cooperation and capacity building, loans to agricultural, industrial and service sectors, elaborates and implements regional development policies, and finances infra-structure projects in the Region (Oliveira, 2005).

EMBRAPA has generated and recommended more than nine thousand technologies for Brazilian agriculture, reduced production costs and helped Brazil to increase the offer of food. One of the research centers of EMBRAPA is located in Petrolina, which has a focus on the semi-arid region. This center has developed technologies directed to irrigated farming such as temporary plants, like melons and watermelons, and permanent and capital intensive crops, like mangoes and grapes (EMBRAPA, 2008).

Back in the 1960s, CODEVASF began working with agricultural production, providing early extension services to farmers. These services played an important role in the agricultural transformation of the valley. Among the activities played by CODEVASF, merit the agency for introducing irrigation practices in the region, distributed irrigation equipments, provided technical assistance and management for temporary irrigated crops like onions and watermelons (Damiani, 1999).

These interventions led to the introduction of new crops in the valley, and to a raise in the irrigated area. Late in the 1960s, CODEVASF turned its approach from small scale irrigation to large scale units. The huge investments would take advantage of economies of scale, mainly canals and pumps, necessary for bringing water to places far from the main water source. In addition, heavy investments in one particular place would trickle down to the surrounding areas. These investments included the construction of water reservoirs, pumping systems, delivery canals, expropriation of lands for irrigated agriculture and the creation of irrigated areas (Damiani, 1999).

In these irrigated areas, CODEVASF divided the land into plots, build on farm irrigation and infrastructure and housing. In addition, the agency leased the developed land to producers and carried out the operation and maintenance of the irrigated projects (CODEVASF 2006).

The combination of heavy public investments and the way CODEVASF managed these irrigation investments contributed to the growth of the Petrolina-Juazeiro valley. CODEVASF applied innovative principles as well, providing subsidies to specific firms, monitoring production and demanding from the producers good performance in exchange for the subsidies that they had received. Turnover in irrigation projects was also utilized (CODEVASF, 2007).

As the irrigated areas started to increase crop production, demonstrating the potential of irrigation, private firms became interested in investing in the Petrolina-Juazeiro valley. As a result, CODEVASF was able to establish in its irrigation projects a mix of family farmers and medium-size agricultural firms (CODEVASF 2007).

According to the development officer of CODEVASF, the agency provided both family farmers and firms with subsidized lease prices for land hectares and built canals to deliver water for irrigation from the São Francisco River to the projects. Family farmers were provided with 6 to 12 hectares of land, while firms received between 50 to 100 hectares for cultivation. The family farmers received also farm-level irrigation infrastructure, such as pumps and internal canals to the farms and drainage systems.

Besides that, family farmers received training in crop, irrigation technology and extension services. On the other hand, the firms were selected based on their knowledge about crop technology and marketing. It is important to note that CODEVASF introduced competition in the provision of subsidies. Agricultural firms interested in establishing in the valley had to bid for the land by presenting project proposals that detailed the type of crops that they would grow, technologies, employment generation, and the prospective markets these firms would sell. Moreover, subsidized land and irrigation infrastructure had to meet production targets. As a result, lease contracts were not renewed if the targets were not achieved. Turnover was encouraged if family farmers or firms did not comply with their project proposals. Although turnover contributed to concentrate land and income, it became a process to improve the performance of irrigation projects because those who entered often had more experience and capital than the ones who exit the projects. In other words, CODEVASF introduced a project monitoring system (Damiani, 1999).

These innovations that CODEVASF applied in the management of its irrigation projects were important not only for improving the agency's projects' performance, but also for the transformation of agricultural production in the valley. Medium-size firms became the main actors in bringing capital investments, introducing new crops and thus transferring technologies to the family farmers.

Another important task was conducted by Valexport, an association of agricultural firms and producers, created in 1986. Valexport helped firms and producers to achieve minimum quality standards, avoiding harvest concentration, and controlling pests that may decimate the crops or even jeopardize the access to international markets. While exporters need to act jointly in order to solve these problems, they often fail because of constraints associated to collective action (Valexport, 2008).

Valexport, which was organized as a marketing board, made possible for growers to set and enforce quality standards and thus maintain a uniform quality of shipments, avoiding export products of lower quality. Presently, Valexport has 35 members, mainly medium sized firms and producers, which represent about 70% of the production and roughly 80% of the exports of the valley (VALEXPOR, 2008).

BNB has been an important financial institution in the Brazilian Northeast, and particularly in the Petrolina-Juazeiro valley. Besides the loans that were provided to family farmers and firms, the bank played an important role helping transfer technology to agricultural producers in the area. BNB requires a project proposal in order to finance agricultural production. In such a project, the bank analyses not only the financial and economic aspects, but also the technology utilized by the agricultural producer. As a result, modern agricultural practices were usually required as a condition to provide loans (Oliveira, 2005).

As a result of the globalization of the fresh fruit sector, and taking into account the heavy public investments, the Petrolina-Juazeiro valley attracted family farmers and medium-size firms capable of producing and exporting high-value fruits. Indeed, the area became one of the most important fresh fruit focal points in Brazil.

Family farmers continue producing beans, tomatoes and manioc, while goats are still important within the valley. The main fruits produced in the area are bananas, guava, papaya, melons, watermelons, passion fruit, acerola and coconut for the internal market, and mangoes and table grapes for the international markets. It is important to note that initially the valley developed temporary crops, such as tomatoes, onions and watermelons, which were gradually substituted by capital intensive and permanent crops, such as mangoes and grapes. Differently from the Chilean experience, and from the banana hubs situated in developing countries, transnational agribusiness corporations are not substantial in Petrolina-Juazeiro. The valley has potential to irrigate an area of 200,000 hectares, of which 120,000 hectares are presently irrigated. Roughly one third of the fruit production in the area is traded internationally. The area exports about half of the Brazilian tropical fresh fruits (Santos, 2008).

The total exports of the valley reached US\$ 265 million in 2007. The exports of grapes and mangoes reached US\$ 216 million, 81.5% of the valley total international sales. Of the total Brazilian exports of grapes, about 95% come from the vineyards in the São Francisco valley (da Costa, 2007).

The success of the northeastern grapes is the result of years of hard work and investments. Nevertheless, winegrowing in the São Francisco valley progressed significantly over the past fifteen

years, mainly in terms of area harvested. In 1990, it was 1,759 hectares, and in 2006 the area harvested had risen to 12,400 hectares, when the crop volume reached 248 thousand tons (IBGE, 2008).

The vineyards have registered yields of 20 tons per hectare of seedless grapes, and 35 tons of common grapes. Since 1990, local grape productions have gone through significant changes. Sales focused on the domestic market were redirected toward the international marketplace, and much value was added to the rising crop (IBGE, 2008). Grape exports triggered initiatives toward quality enhancement, due to the requirements of the foreign markets. The main varieties produced in the valley include Italy, Red Globe, Benitaka, and Brasil. Among the seedless grapes, now expanding rapidly, the ones that stand out are Superior, Thompson and Crimson (da Costa, 2007).

The valley accounts for more than 90% of Brazilian foreign sales of mangoes. The area devoted to mangoes increased from 580 hectares in 1990 to 17.1 thousand hectares in 2007. At present, the annual production is 394 thousand tons, meaning a productivity of 23.1 tons/hectare. Of the 17.1 thousand hectares of mangoes cultivated in the region, 13.3 thousand hectares are situated in the public irrigated perimeters that are occupied by both family farmers and agroindustrial firms (Favero et alii, 2008).

The public areas represent 60% of the total mango production in the valley. About 67% of the producers cultivate mangoes until 1 hectare. The main varieties cultivated in the valley are Tommy Atkins (86.7% of the total), Palmer (3.6%) and Kent (3.3%) (Favero et alii, 2008).

6. CONCLUSIONS

The globalized agriculture is characterized by the rise of foreign investments, transnational agribusiness corporations and internationally integrated agro-food systems. The development of this system has helped create a “New International Division of Labor” in agriculture, characterized by the location of different parts of the production complex at various points across the globe. As a result, food production and agricultural resource allocation became largely linked at the global scale.

Fresh fruits became one of the most globalized products within the agricultural sector. The globalization trend has been facilitated by cost reduction in transportation, improvement in cold chain facilities, modernization of infra-structure, augmentation of middle class income, changes in the dietary habits and the growing importance of transnational corporations. Although the long distance trade of fresh fruits are highly complex, considering that these products are perishable, it is estimated that roughly 10% of the world production of fruits are traded internationally nowadays, which means about 55 million tons per year.

Production of fresh fruits for export has grown in Brazil, and it is present in over 30 production hubs. The Brazilian Northeast became one of those hubs, where its fruit production and exports come mainly from irrigated valleys, such as the Petrolina-Juazeiro one. In these areas, fruit plantations rely on a series of irrigation projects, where up to two and a half crops are produced in a year round. The production includes small-scale producers as well as commercial enterprises, covering nowadays about 500,000 hectares.

As a result, these irrigated areas became major exporters of mangoes, table grapes, pineapples and melons, which are traded mainly to European and North American markets. Fruit exports have contributed to transform the Petrolina-Juazeiro valley: it has attracted producers, agribusiness firms, services companies, undergraduate schools, machinery and farm implement manufactures. Besides

that, the job market has expanded in the export-oriented valley, as well as the diffusion of modern production technologies and marketing.

However, the transformation of this valley into a focal point of fresh fruit production can not be explained entirely by the globalization of the fresh fruit value chain, nor can it be explained exclusively by the change in consumer's pattern towards an increasing consumption of "healthy foodstuffs." Although globalization facilitates market access for fresh fruit produce, this paper argued that the development of the Petrolina-Juazeiro valley is due to a long-standing government intervention through several public agencies that worked actively in these areas along with family farmers and private firms. It is important to note that medium sized firms as well as family farmers became the major producers of mangoes and grapes. As a result, the valley does not rely on transnational corporations for fruit production and exports.

Through these agencies, the federal government provided public goods, such as electric power plants, roads, irrigation infra-structure, extensive agricultural services, research and financing to family farmers and agricultural firms. As a result of the globalization of the fresh fruit sector, and taking into account the heavy public investments, the Petrolina-Juazeiro valley attracted family farmers and medium-size firms capable of producing and exporting high-value fruits, such as mangoes and table grapes. Indeed, the area became one of the most important fresh fruit centers in Brazil.

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