

## **LEARNING TO EXPORT: THE ADOPTION AND DIFFUSION OF EXPORTING IN BRAZILIAN AGRIBUSINESS**

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## **Learning to Export: The Adoption and Diffusion of Exporting in Brazilian Agribusiness**

### **ABSTRACT**

This paper explores the process by which innovative firms in a sector adopt exporting as a business activity, and how this idea spreads among other players. Not only the study of the adoption and diffusion of internationalization as a business strategy has received little attention, but the study of such processes in an agricultural research setting is almost absent from the literature. To attain the research goals, a qualitative research strategy with a longitudinal approach was used. A specific experiment in an agribusiness sector was selected for investigation: the development of grapes exports in a region of the São Francisco Valley. This is a real high-growth episode, with total exports rising from \$1.8 millions in 1989 to \$107.2 million in 2005. Data collection was based on in-depth interviews with various players and secondary sources. The study examined the role played by various actors, including business and government organizations, in the success of the experiment, and examined externalities, market failures and spillovers in this process. Results showed the role played by the first mover in the success and the speed of the diffusion process, as well as the importance of well-managed and balanced government intervention.

### **THE INTERNATIONALIZATION OF AGRIBUSINESS FIRMS**

The internationalization of agribusiness firms in a region can be studied from the perspective of the adoption and diffusion of innovations. The movement towards international markets is seen as a process starting with the “discovery” of exporting and its adoption by one or a few innovative firms and later, in case the experience is successful, the diffusion of this business experiment among other firms in an

agricultural cluster. This conceptualization of business behavior emanates from the traditional research stream of Diffusion Research, as well as contributions from the discipline of International Business, and from recent work in the field of Economics.

The most important stream of research on the phenomenon of adoption and diffusion of innovations comes from the seminal work developed by Everett Rogers and followers. Rogers published the first book compiling various diffusion research traditions, aiming at stimulating a more interdisciplinary view of the phenomenon of the adoption and diffusion of innovations. According to him, the roots of diffusion research are found in European sociology and anthropology of the beginning of the 20<sup>th</sup> century. Rural sociology was the research tradition that shaped diffusion research, showing the largest number of studies (Rogers, 1995). Most studies, however, looked at how scientific results were transferred and implemented by farmers, as well as at their adoption of agricultural management practices. These studies did not look at how farmers in general – individual settlers or agricultural firms – adopted business strategies, such as internationalization.

The view of exporting as a process of adoption of an innovation appears in early work in the international marketing and international business literature, with the first studies dating back to the 1960s and 1970s. The first study identified was developed by Simmonds and Smith (1967), using case studies, who searched for the stimuli behind the adoption of exporting as a business strategy, and found external agents as the most important factor in export initiation. Subsequently, Lee and Brasch (1978) used diffusion theory to explain the “rediscovery” of exporting by U.S. manufacturers. They found empirical support for Simmond and Smith’s contention that external agents played a significant role in the adoption process of exporting as an innovative business strategy. More recently, Samiee, Walters, and DuBois (1993) addressed the issue from

the perspective of the single firm, defining an export innovator or initiator as a firm that showed a “self-induced desire to engage in exporting” (p.11). The study determined the existence of significant differences between export innovators and non innovators in a number of characteristics. In general, the authors concluded that export innovators were more prone towards exhibiting “desirable” patterns of export behavior. Despite the pioneering characteristics of these studies, the use of diffusion theory to explain export behavior received subsequently almost no attention. The lack of interest in the topic might be explained by the fact that the process of adoption and diffusion of an innovation must be seen in the context of a group of actors, and not as an individual phenomenon.

In the field of Economics, the work of Hausmann and associates focused on how the “discovery” of new export activities by firms could be associated to high-growth episodes in a country. They found from an examination of cross-country economic data that such episodes often had an idiosyncratic nature, varying from one situation to another (Hausmann, Pritchett, and Rodrik, 2004). The “discovery” of the exportability of a given product by a firm, in their view, had an extraordinary importance in economic development, but they believed that “...entrepreneurship of this type...will typically be undersupplied, and economic transformation delayed” (Hausmann and Rodrik, 2003, p.605).

The authors suggest that potential entrepreneurs in developing countries could be compared to potential innovators in developed countries, as the returns on investments demanded to learn what a country is good at producing could not be entirely appropriated. Nonetheless, they stressed that once the initial difficulties are tamed by the pioneers, imitators may come along almost immediately, washing away first movers’ profits. Hausmann, Hwang, and Rodrik (2005, p.2) further suggested that, once

a firm successfully developed a new export activity, “if the project is successful, other entrepreneurs learn that the product in question can be profitably produced and emulate the incumbent”. The authors concluded that free entry by competitors worsens even more the situation faced by potential entrepreneurs in developing countries. Public policymakers should thus be aware of such distortions, starting by encouraging entrepreneurship in new activities but later letting unproductive firms and sectors fail.

Concerning the diffusion process itself, the literature is plenty of examples to clarify its pattern. Diffusion research emphasized the role of innovators’ and adopters’ characteristics in influencing the speed of diffusion, as well as of the perceived attributes of the innovation itself. In addition, the literature shows that the type of innovation-decision, the nature of communication channels available, the nature of the social system, and the role played by change agents could significantly affect the rate of adoption of an innovation (Rogers, 1995). The author also indicated that “providing incentives is one means through which a higher level of social organization, like a government, community or a commercial company can exert its influence on the behavior of individual members of the system” (Rogers, 1995, p. 222). Another mechanism of diffusion suggested in the literature is the turnover of skilled employees who have acquired the necessary expertise on the job. In fact, losing such employees to later movers proved to be one of the most relevant competitive concerns faced by the pioneers, as indicated by Hausmann and Rodrik (2003). Entrepreneurial spin-offs are another type of diffusion mechanism, although they are sometimes described in the literature as a sort of parasites or as a brain-drain from parent firms (Ferreira, Tavares, and Hesterly, 2006). Geographic proximity may also play a major role in stimulating the development of interactions among players, and to accelerate diffusion. These “systemic interactions” – interactions among firms, or between firms and government agencies,

universities, research centers, and other institutions – are often the motor of innovation, facilitating the discovery and the diffusion process (Iammavarino, Sanna-Randaccio, and Savona, 2006).

Developments in the area of firm internationalization in the last two decades emphasized the role of social networks (Johansson and Mattson, 1988, 1992; Hakansson and Snehota, 1995; Welch et al, 1998). Firms are not stand-alone actors, but they enter exporting as part of a network of other firms (Bonaccorsi, 1992). Despite these conceptual advances, even network studies tended to look at internationalization from the perspective of a single actor, and firm membership in networks as part of the entrepreneur's social capital (e.g. Coviello and Munro, 1997; Blomstermo et al, 2004; Jones and Coviello, 2005). Other research on networks of innovators, although not concerned with the phenomenon of internationalization, looked at how inter-firm networks are associated to the success of an innovation, but even the original management studies on this subject “have focused on decisions and prescriptions for individual actors” (DeBresson and Amessee, 1991, p. 367).

In this paper, we examine the internationalization of agribusiness firms in a region from the perspective of the adoption and diffusion of innovations. In the case of agribusiness, natural conditions tend to invite firms to copy each other, since firms in the same location tend to have access to similar resources, such as soil and climate. Because of this, it is often the case where not only firms mimick each other, but they also create formal or informal cooperative organizations to purchase, produce, and take their products to the marketplace.

Accordingly, this paper addresses the issue of the adoption and diffusion of exporting as a collective business strategy in Brazilian agribusiness. It is assumed here that the adoption of exporting by firms follows the typical adoption and diffusion process, with

a pioneering firm starting the process, and other firms imitating. The following research questions guided the study:

- How does the adoption of exporting by a leading agribusiness firm in a region occur?
- How does the diffusion process of exporting as a business strategy occur within the region?
- What is the role played by government and other support institutions in the adoption and diffusion process?

## **METHODOLOGY**

To attain the research goals, a qualitative research strategy was elected. A longitudinal approach was used to examine the research problem. A specific experiment in an agribusiness sector was selected for investigation: the development of grapes exports in the Petrolina – Juazeiro region of the São Francisco Valley, Northeast of Brazil. Data collection included personal interviews with managers of agribusiness firms in the region, traders, members of cooperative associations, government officials, etc., and secondary sources. A total of ten in-depth interviews were conducted from June to December, 2006. Each personal interview lasted between one and two hours. All interviews were recorded and transcripts were made. In some cases, information obtained from secondary sources and from personal interviews was in disagreement. Several consultations with interviewees by telephone and e-mail were made to check conflicting information as fieldwork and data analysis progressed. The analysis proceeded in two steps: descriptive and analytical. The first – descriptive – step included: (i) the preparation of a report, covering general information on the case studied and historical background; (ii) a detailed description of the process of adoption

and diffusion of exporting as an innovation in the Petrolina-Juazeiro region, including historical information on the role of the leading firm and followers; (iii) a descriptive account of the role of support institutions, private and public, in the process. The second – analytical – step consisted of the understanding of the diffusion process and the extraction of general conclusions.

## **THE PHENOMENON UNDER STUDY: THE DEVELOPMENT OF BRAZILIAN EXPORTS OF TABLE GRAPES**

Brazilian fruit exports boomed during the last two decades. Total fruit exports increased from \$185 million in 1989 to \$ 676.8 million in 2005. Grape exports have been one of the most successful cases, having increased from \$1.8 millions in 1989 to \$107.2 million in 2005. The region of Petrolina and Juazeiro, which is part of the São Francisco River Basin, in the Northeastern states of Bahia and Pernambuco, is responsible for this export performance. Growers in Petrolina-Juazeiro produced 95% of the country's table grape exports in 2005. In the region, over 600 growers cultivated 6,000 hectares of grapes, and hundreds of other farmers produced mango, bananas, coconuts, watermelons, and other crops. These crops employ more than 29,000 workers in the region (Gomes, 2004). Since the early 1990s it became one of Brazil's most successful fruit exporters. Since then, the region has been exporting high quality fresh fruit to several countries including Europe and the United States.

The region, described as an open-air greenhouse by *The Economist*, changed due to irrigation projects implemented during the sixties and seventies. Its good climate, state-of-the-art irrigation system, and advances in biotechnology have allowed yields in the area to be much higher than those of the Southeastern region of Brazil. These districts are blessed with a continuous supply of sun, about 3,000 hours, or 300 sunny days per



year, fertile soil, and low levels of humidity (Hirsch, 2005). All these factors are beneficial to certain crops, creating an environment resistant to plagues and disease. Such favorable weather conditions enable farmers to harvest two to three times a year and to supply the European Union during market windows, particularly the month of November, when production worldwide is low.

## **Background**

The development process in the Petrolina-Juazeiro region began in the late 1960s, when this area was no different than most rural areas in Northeast Brazil, underdeveloped, and lacking basic infrastructure. Government infrastructure investments, particularly large-scale irrigation projects (reservoirs, delivery canals, and land settlement-like irrigation schemes), triggered the region's development.

Codevasf, a federal government agency created to promote the development of the São Francisco River Basin, carried out most of these projects. In Petrolina – Juazeiro, Codevasf expropriated land and implemented six large projects. The expropriated land consisted of lots that contained 6 to 200 hectares, and covered a total of 38,000 hectares (Damiani, 1999). These lots were distributed to small and large farmers. Codevasf also built irrigation infrastructure to channel water from the Sobradinho dam to each individual lot, and facilitated credit and market access to small farmers (Gomes, 2004). The initial Codevasf's strategy was the establishment of a tomato-processing industry during the early 1980s. Yet, this industry turned out to generate limited results and not to deliver the expected development effects.

According to Damiani (1999), the state of Pernambuco was at the time the second largest tomato producer in Brazil, and Codevasf decided to promote the cultivation of tomatoes for industrial use. Codevasf attracted tomato-processing industries to the

region with the idea that producers in Petrolina-Juazeiro would use irrigation and thus could obtain tomatoes during the off-season when the tomato processing industry could not purchase crops from other regions. Codevasf thus hoped to stimulate the industrial development of the region. However, the conditions that gave rise to the tomato boom changed dramatically during the late 1980s, and drastically reduced these crops. A series of factors led to its deterioration. First, the emergence of a new pest (named “traça”) harmed tomato crops in 1988, leading to very low yields and big losses. Farmers were forced to use expensive pesticides, thus increasing production costs, even though the processing industry had supplied technological packages to target pests since the early 1990s. Second, as a consequence of these events, the trust relationship between farmers and the processing industry deteriorated. Lastly, the federal government implemented lower tariffs for imports, which made imported tomato products more competitive than domestic ones. The presence of the tomato industry was crucial for the Petrolina-Juazeiro region, for it played an important role in the learning process of the production of irrigated crops. It was by this process that producers learned important techniques that were later on applied to other export crops.

The region was also an important melon producer before it became a leader in grape and mango production. Yet, production problems due to the heterogeneity of products and the inability to guarantee a certain level of quality led to a decrease in prices, and production was interrupted. Grapes and mangoes then became the main export products of the region. Investments in production began during the 1980s, but it was only during the late 1990s that exports started to grow due to the introduction of seedless grapes. The grape export growth trajectory was only interrupted in 2004 mostly due to weather fluctuations: strong and abnormal rainfall, and the rise of humidity levels, which damaged some of the crops.

## **THE DISCOVERY AND THE DIFFUSION PROCESS**

The first firm to export grapes in the region was Cotia, a São Paulo-based cooperative founded in the 1950s by Japanese immigrants that was the largest agricultural cooperative in the world in the 1980s. Cotia began its work in the Petrolina-Juazeiro region in 1978, when it leased an area of 1,927 hectares (834 of them irrigated), establishing 36 of its members from São Paulo and Paraná (Damiani, 1999).

Cotia already had some experience exporting fruits (including grapes) in other regions of the country, but it was not the first to produce grapes in the region. When Cotia arrived in Petrolina – Juazeiro, Fazenda Milano had already been producing grapes for the domestic market. These first attempts to produce grapes started in the 1950s, but experienced several adaptation problems given the region's tropical climate. Molina, a Spanish national, was in fact the first grower to cultivate grapes in a large commercial scale starting in 1958. Yet these first attempts did not generate an enduring cultivation of grapes, neither the output was successfully exported.

Cotia was attracted to the region because of its dry climate, and of Codevasf's policies aimed at bringing new firms to the region. In the end of the 1970s, Cotia already exported grapes produced in the São Miguel and São Paulo regions to the United Kingdom and the Netherlands. Yet, this production was constantly damaged by excessive rainfall in those regions. Knowing the problem, and with a South African experience in mind, a British customer suggested that the cooperative should look for a region with less rainfall.

Cotia had previous knowledge of the fruit production potential of the Petrolina – Juazeiro region. In fact, the cooperative had bought melon produced by two irrigated

projects in the Northeast since the mid-1970s. In addition, managers knew that the region could produce table grapes all year round.

At the same time, Codevasf's officials were trying to draw potential investors to the agency's irrigation projects in the Northeast. Cotia's success was recognized all over Brazil, and the cooperative was known as an important exporter of several agricultural products (e.g., coffee, soybean, apples, and cantaloupes). It was also recognized for buying production from affiliated farmers and successfully exporting their output. Codevasf believed that Cotia could play a leading role in diversifying the crops produced in its irrigation projects, not only in Petrolina-Juazeiro, but also in the other regions of the São Francisco Basin where the agency was initiating new irrigation projects. With this potential in mind, Codevasf offered Cotia an irrigated area.

In addition, according to Damiani (1999), one of the strongest appeals to Cotia was the possibility of its members' children to own land in the area. These young men were interested in becoming farmers themselves, but had difficulties in finding low-priced land in the São Paulo and Paraná states.

Grapes were not the first product to be produced and exported by Cotia members in the Petrolina-Juazeiro region. Its members first attempted the cultivation of tomato and melon crops in the region and failed for the reasons earlier described. Tomato production had been heavily promoted by Codevasf in the beginning of the Petrolina-Juazeiro development, but production and market conditions changed dramatically during the late 1980s, and drastically reduced this type of crop.

Melon production was started in the early 1980s by a group of Cotia growers who sooner became the main suppliers for the domestic market, and the only producers from Petrolina-Juazeiro to export melon to Europe. The initial success of Cotia growers and

the good prices obtained for their fruit inspired other growers. The subsequent increase in production attracted several exporters from São Paulo and other cities of the Northeastern states. By 1984, Petrolina-Juazeiro had turned into the main Brazilian exporter of melon. But the entry of new producers (most of them settlers from other regions) brought a large variety of production techniques (e.g., different varieties, application of several fertilizers and pesticides, etc.). Accordingly, the quality of production was very diverse, and the region produced different types of melons, with different taste. New problems arose, since it was not possible to assure the quality of the melons exported, leading to a substantial decrease in price, as bad quality fruit was being shipped to Europe. In 1986, the price of melons decreased dramatically and reached levels that could no longer cover export costs. This decrease in prices led to the collapse of the crop and to the default of many small farmers that participated in government-sponsored irrigation projects. Melon cultivation declined from 1987 on and production never recovered to its original levels. Melon production in the area covers less than 1,200 hectares (Damiani, 1999)

It was at this point that Cotia got directly involved with the cultivation of grapes in the region. The main uncertainty Cotia faced with regards to grape exports was in production. Even though grapes had already been produced in the region, many problems still remained. Some producers were unsure about producing in sandy terrains. The production technology had to be adapted (and continues to be adapted until today). Initially, the grapes were too small and productivity was low. New levels of productivity were reached due to the use of new processes and new technology.

The first grape exports took place in 1985 after previous attempts with other fruits. The cooperative did not face many obstacles in marketing its grape production. Cotia had a long experience exporting agricultural output, including coffee, soybean, and fresh

fruits like melon and apples, crops that its members already grew in other regions. Among the distribution channels utilized was an international office in Rotterdam, established during the mid-1960s to market the cooperative's output in Europe. With this office, Cotia was able to maintain a direct relationship with several buyers, who often visited production sites in Brazil.

Since production was labor and technology intensive, Cotia's members had to hire people and train them in order to properly cultivate the grapes. This led to the creation of a qualified labor force. One of the most important growers in the region, Nelson Costa, commented Cotia's role in the region:

“Cotia was an inspiration for the region. They arrived in the region and contacted the families there. They hired and trained these people, and the people learned. COTIA began an extraordinary process: education for the use of agricultural techniques. These included pruning and the know-how to manage the vineyards. Cotia's contributions to the region are outstanding. They professionalized and provided a higher standard of living to people of the semi-arid Northeastern region of the country, who prior to Cotia's arrival had lived without any expectations of professional development.”

Cotia spread its experience and expanded the agricultural frontiers of Brazil until 1994, when it collapsed because of an overextended bureaucracy, and financial problems. The group of producers in Petrolina-Juazeiro that were members of Cotia created the Agricultural Cooperative of Juazeiro (CAJ), which has presently eighty members.

### **The Diffusion Process**

Other firms followed Cotia, as well as smaller local farmers. But it was only in the 2000s, after Cotia had bankrupted, that the exporting of seedless grapes, introduced in the end of the 1990s, led to outstanding export growth rates.

Cotia's example was followed by many others. At first, smaller local farmers started to cultivate grapes. In sequence, the region underwent two important expansion periods, one from the end of the 1980s to the end of the 1990s; and the second from the end of the 1990s to the present days, with the introduction of seedless grapes.

The first period took place at the end of the 1980s, when different companies were attracted to the region by Cotia's success. The companies that arrived and invested in the region following Cotia were quite different from those in other areas of the Northeast. These were firms from other sectors, mainly from industrial sectors, which had capital, and an entrepreneurial vision of agriculture. Additionally, they had a strong desire to export their products. By the mid-1980s, not only the members of Cotia were growing grapes in the Petrolina – Juazeiro region, but also six or seven other firms with large farms. The quality of production of most producers was very heterogeneous, each one obtaining fruit of both very good and very poor quality. The earlier failure in exporting melon was a reminder that the same problems could emerge again, once many producers with different product quality were exporting to the same markets from the same region.

Avoiding these potential problems would require cooperating with other exporters to work out a way of jointly achieving similar quality standards in production, classification, and packaging. Cotia managers concluded that they would need to become more involved in agricultural production to help other farmers with production technology, and to coordinate a joint effort with the other exporters, by supporting the creation of an association of fruit exporters. As a result, in 1992 seven table grape

producers created the Brazilian Grapes Marketing Association (BGMA). Even though, BGMA's creation was Cotia's initiative, the association was established as a special division of Valexport, the association of the San Francisco Valley Exporters, created in 1988. BGMA became part of Valexport to avoid having decisions monopolized by Cotia. Despite of it, Cotia continued to play a crucial role in BGMA's evolution. Cotia provided BGMA managers and information to help address issues related to the export of fresh agricultural products. In addition, BGMA used Cotia's offices in Rotterdam, taking advantage of the cooperative's contacts with European buyers.

BGMA played a crucial role since then in the export growth of seedless grapes from the region. Producers agreed to enforce certain quality standards, and designed a joint production and marketing strategy. The idea was to avoid predatory competition and to market a common brand. They also made joint contracts for transportation and packaging materials and negotiated with the government infrastructure investments in the region. A brand name was developed under which the authorized production of BGMA members was sold in foreign markets.

Sound policies of quality control were adopted with penalties to those who did not comply with the rules. The production was sampled and inspected by a quality control team, following specific rules dictated by a quality manual. Producers that did not adhere to the standards set by the association were not allowed to export. (BGMA's president is proud to state that every producer that did not comply with the rules at any point was penalized, regardless its political importance.) Foreign buyers also monitored quality and complaints in European and U.S. supermarkets. Distributors were informed of any problems and this information was sent to BGMA, which in turn informed the faulty producers, that were then subject to price penalties.



The first expansion phase started in the late 1980s and continued throughout the 1990s, with a rather slow progression. Macroeconomic conditions, particularly the appreciation of the Real, made exports less attractive during the second half of the 1990s. A second expansion started by the end of the 1990s, with the introduction of seedless grapes. These crops were extremely attractive because of their high returns (about three times more profitable than the common grape). But there were technological challenges to overcome before the crop could be adopted. Embrapa had already been involved with seedless grape (Thompson type) experiments in the Southern regions of the country. Some farmers imported samples of a seedless grape species developed in California, and planted them in an experimental area with the financial support of Sebrae, the Brazilian support service for small and medium-sized enterprises. Other entrepreneurs planted seedless grapes at their own risk. By the end of the 1990s, after a trial-and-error period, seedless grape crops in the region succeeded, and were responsible for an increase of more than 1000% in the region's exports.

The production of seedless grapes during production periods different from those of other producing countries was three times more profitable than common grapes. With this profitability prospect, the cultivated area in the region rapidly increased from 4,200 to 12,000 hectares. The region's climatic conditions allowed for a grape plant to begin producing fruit within approximately a year and a half. This constitutes half the time a regular grape plant would need to produce fruit in other regions of the world. This condition facilitated the learning experience and permitted that the necessary adaptations could be introduced at a much lower cost and risk.

The results were dramatic. Grape exports jumped from US\$8.6 million in 1999 to \$107.2 million in 2005. During this period new farmers came to the region, following the steps of those already successfully established there.

Today, BGMA is responsible for 60% of the region's grape exports. The rest comes from small and large producers that sell their products to other exporters or directly to importers. The association developed the North-American, Canadian, Russian, and Spanish markets, and continues to carry out an important role in opening new markets. In 2006, it was negotiating with China. Currently, BGMA encompasses 22 firms with 150 producers. In the last three years BGMA has not accepted new members since, according to its president, "BGMA's main objective is not to be the São Francisco Valley's main producer, but the best producer in the area".

### **The Role of Support Institutions in the Process**

The Brazilian government made substantial contributions to the development of the Petrolina – Juazeiro region. The most important government agency was Codevasf (The San Francisco River Valley Development Agency), but other institutions such as Banco do Nordeste (a regional development bank), Sebrae (the support agency for smaller firms), and Embrapa (the federal agricultural research agency) also contributed to the region's success. Some of the government interventions resulted from strategic decisions, while others were indirect effects of the policies implemented.

There are four main ways in which Codevasf influenced the development of the region. First, it was responsible for the construction of the entire irrigation infrastructure and covered water costs for an extended period of time in order to increase the attractiveness of the region to investors. Second, the institution played an active role selecting and monitoring agricultural firms that got established in the region, which included attracting the pioneer firm. Third, Codevasf promoted the diversification of cultures in the region, and stimulated investment of high-value export crops. Lastly, the institution

supported the creation of Valexport, the San Francisco Valley association of exporters, and the creation of BGMA, the joint export marketing association.

Codevasf attracted several firms to the region with a policy of mixing large firms with small producers in the distribution of land. As a result, small farmers and larger firms interacted, which in turn stimulated a shared learning process. Large and medium-sized firms brought capital and technology to the region and small farmers were able to incorporate these technologies, and develop new crops. Octavio Damiani, a researcher on the development of the region, highlighted in an interview the diverse profile of the firms attracted to the region:

“Several firms that were established in Petrolina came from other industries. This means that they had capital but also had a business vision. The traditional Latin American businessman always wants the State to pay for everything. This did not happen in this particular case. In this case, entrepreneurs from Petrolina – Juazeiro were very open-minded. This was also very important... Also these entrepreneurs were aware of their reputation abroad because they made a living from their exports. This is why they were concerned with not generating a negative image. For example, they did not employ child labor and tried to prevent strikes because they were aware that these could lead to a negative perception of them. So, I believe that the type of entrepreneur that arrived to the region was key in terms of the development of the region. I believe, once again, that Codevasf was very important in attracting these types of firms.”

These actions meant a radical departure from the usual practices applied to the management of land settlement projects in Brazil and other regions, where the main beneficiaries tended to be landless farmers who only cultivated traditional crops.

Additionally, Codevasf created a competitive environment in the region as it had firms competing for subsidies, and granted these to those with the best project proposals.

Another area in which Codevasf contributed was in promoting crop diversification. With the failure of tomato production in the region, Codevasf started to promote the diversification of crops among individual farmers and firms. Highly inspired by the Chilean success, which was well known by the executive team of Codevasf, the central offices of Codevasf in Brasilia created a task force in 1986 with this purpose. The task force organized workshops to promote high value perennial crops with high export potential such as grapes, mango, and banana. Most of the workshops and meetings organized were held in the cities of Petrolina and Juazeiro. The main objective of these workshops and meetings was to discuss possibilities and challenges of selling the region's agricultural products in foreign markets. Often, Codevasf would invite international and local specialists to lecture about a wide range of issues of interest to exporters. Some of the issues discussed during these workshops and meetings included the following: consumer tastes in specific export markets, rules governing imports of fresh fruits in European countries and the United States, and the organization of agricultural markets in the main importing countries.

Codevasf also stimulated the creation of Valexport by supporting and advocating its advantages, and by giving financial and technical support to the association during its initial stages. The institution argued that growers needed an association for at least the following powerful reasons: a) to collect information and search for export markets; and b) to press the federal government to carry out policies and other interventions that helped fruit producers to export, such as investments in infrastructure. Valexport's role in export development is however controversial. Some interviewees believed that Valexport played a fundamental role in promoting exports, introducing quality controls,

and attracting public investments, but an important entrepreneur in the region and long-time member of Cotia argued that the most important actions in this direction, such as the creation of BGMA, were more an initiative of Cotia than of Valexport.

In addition to the role played by Codevasf, the development of agribusiness in the region was also supported by the Banco do Nordeste, one of the main public banks in the Northeastern region. The bank had an instrumental role in providing credit to farmers, but was also actively engaged in technology transfer. According to Damiani (1999), at the same time Banco do Nordeste was involved in the process of providing credit to firms and settlers, which enabled them to grow perennial crops, it also acted as an intermediary in the transfer of technology between these players. This process was associated to the Bank's credit application process, which required firms applying for credit to detail the technology to be used in their projects. At the same time, the Bank required that small farmers used the same technologies that large firms were using in order to grant them credit lines. Bank officers often visited these firms to assess the status of the different project proposals, becoming the first to know about new technological advances by firms in the region.

Embrapa had a minor role in the export development of seedless grapes. The Embrapa office in the region was focused on products for non-irrigated areas. Only by the end of the 1990s Embrapa Semi-Arido division re-evaluated its priority list, and started to develop research on irrigated agriculture, becoming actively involved in the study of export crops.

## **ANALYSIS**

Grapes production in the São Francisco Valley was the result of investments of existing firms from the Southeast and South of the country in response to government

incentives. The development of the Petrolina – Juazeiro region is in fact a rare example of a joint effort by public and private actors. This partnership led to the successful development of a region now considered an oasis of wealth in the Brazilian Northeast, the country's poorest region. The public sector, by means of Codevasf, played a crucial role in creating infrastructure, attracting leading firms, and diffusing knowledge throughout the region. Additionally, companies were stimulated to continually invest in more profitable crops and in supporting the creation of an association that would promote the sector's interests in exporting. Yet, all the aforementioned efforts might not have succeeded, had it not been for Cotia, the pioneer cooperative enterprise that acted as an important catalyst in the whole process.

### **The Nature of the Innovation and the First Mover**

The innovation was the development of table grapes in a new agricultural region to be exported. Grapes cultivation already occurred in the South of Brazil, but typically grapes were not exported, because of a lack of country competitive advantage, and the fact that the domestic market could absorb the production. There was almost no tradition in Brazil of exporting table grapes, except in very specific cases. The first mover was one of the very few firms with a history of successfully exporting grapes and other fresh fruits from the country.

There had been an experiment of producing grapes in the region before Cotia's arrival, original production of grapes in the area – before Cotia's arrival to the region – was not but these initial efforts were not very successful and did not include any relevant breakthroughs that led to subsequent developments. For this reason, there is a consensus among interviewees that the first mover was in fact Cotia. Its main role in the discovery and diffusion process included:

- to recognize the region's potential for export crops;
- to adapt technology to the region's climate;
- to develop foreign markets; and
- to disseminate to other growers its production techniques and its international marketing knowledge.

By means of these actions, the cooperative led other growers in the region to generate a very successful agricultural cluster. Cotia played a leading role in the export success of Petrolina – Juazeiro, as expected by Codevasf. While operating in the region, the cooperative demonstrated the export potential of the region and also trained the labor force in the production and marketing of agricultural products, opening up markets for other producers. It played a very important role in the diffusion of technical and commercial knowledge.

Cotia was already an outstanding organization at the time of its arrival in the Petrolina – Juazeiro region. Started in São Paulo by Japanese immigrants, it became the largest agricultural cooperative in the world in the 1980s. Despite its giant size, Cotia's managers were quite entrepreneurial. These characteristics were of paramount importance in the success of this business experience, mainly because it was the only firm with technical and marketing know-how that could be useful in the project. Also, the first mover was willing to share its know-how with other firms in the region, forming a very successful joint export cooperative group. The reasons why the first mover was so ready to cooperate derive from a previous failure with another crop in the region attributed to lack of cooperation among growers, and to its own nature as a cooperative. In fact, the concept of cooperativism includes the idea of sharing and of joint action.

Cotia became the first mover for three specific and easily identifiable reasons:

- The cooperative was searching at the time for a new area, with a dryer climate, to plant grapes;
- There was an interest in developing new cultivation areas to expand the agricultural frontier and give the younger generation of the members' families an opportunity to own their own land;
- The cooperative was contacted by Codevasf, which offered attractive incentives.

Cotia pioneered several other initiatives in the expansion of Brazilian agriculture. Another example of its pioneering role can be found in soybeans production in Barreiras, Bahia, which is considered one of the new agricultural frontiers of soybean production in the country. It also played an important role in apple production in Santa Catarina, the country's main apple exporting state.

Cotia did not have to face any marketing difficulties, since it already had an office outside Brazil, and had accumulated experience for many years in the exporting of fresh agricultural products. In fact Cotia had a trading company that operated all over the world. Main difficulties faced by the cooperative came from technical problems, related to the management of the soil and the adaptation of grape varieties to the region. These were dealt with by trial-and-error, and by the transfer of technology and know-how obtained in other areas of the country.

Cotia did not survive to the turbulent Brazilian business environment, and went bankrupt in 1994. Main problems were its excessive bureaucracy, combined with inadequate financial management practices. Being a cooperative, Cotia could disappear without the loss of its various achievements in the agricultural area. In the specific case of Cotia members in the Petrolina – Juazeiro region, the evidences collected in this



research suggest that they strongly benefited from the cooperative's initiatives, and did collect the awards for their entrepreneurship in the Petrolina – Juazeiro region. They reorganized in a much smaller cooperative, The Agricultural Cooperative of Juazeiro, that continued to act in a similar manner.

### **Characteristics of Followers and their Strategies**

Firms that entered the new cultivation area of Petrolina – Juazeiro, with the exception of the first mover, did not have previous experience with this agricultural product, or in some cases, with agriculture at all. There were basically two kinds of followers: individual settlers and firms. Individuals settlers were typically people from the region, but sometimes also from other parts of the country, especially from other regions of the Northeast. These farmers did not have much technical know-how to be used in irrigated agriculture, and strongly benefited from the association with larger firms. Larger firms came from outside the region, mostly from the South and Southeast, and were from various sectors. These companies were carefully selected by Codevasf, and brought capital, technology, and management know-how that were later transferred to other firms in the region.

Imitators used exactly the same strategies as the first mover. The main producers decided to standardize their production and to develop joint export marketing activities in order to increase their export potential and avoid negative spillovers from one operation into another.

The first step was product standardization, combined with rigid specifications and quality control mechanisms. Once production practices were standardized and growers were getting essentially the same product quality, the next step was to develop a joint marketing strategy. Marketing and sales were carried by BGMA, the joint export

marketing association that was put together by Cotia with the support of Codevasf. In fact, one of the major contributions of the first mover was the transfer of marketing know-how to other firms, by means of BGMA. Not only the first mover shared its marketing know-how, but it also shared its export marketing facilities with BGMA. In addition, a brand name was created to serve as an umbrella for the products of all BGMA members. This brand name – Copacabana Gold – became a synonym of quality for foreign buyers.

### **Externalities, Coordination Issues and Spillovers**

The failures experienced with previous crops – tomato and melon – were important learning experiences. The earlier failure with exporting melon motivated Cotia managers to make a joint effort to avoid similar problems, leading to the creation of a growers' association to resolve collective problems and commercialize the crops. During the 1990s this association played a crucial role in expanding exports from the region. BGMA is perhaps the biggest success case of joint export marketing groups in Brazil. Additionally, the cooperation between growers and public institutions was decisive to the success of exports. All these cooperative efforts were promoted by the pioneer firm and stimulated by Codevasf. Producers were aware that cooperation was important in order to succeed because their prior experiences had proven that success was unattainable without cooperation.

Spillovers were mainly the result of Cotia's efforts to promote collective action and its efforts to train local workers in the use of agricultural techniques. One of the major positive spillovers, in fact, was the emergence of a well-trained and better paid workforce, different in almost every regard from the typical agricultural worker of the Northeast region of Brazil. Codevasf itself actively stimulated spillovers from firms to

local settlers, under the form of technical and marketing know-how. This was achieved by mixing together the two groups.

### **Institutional Responses**

Public institutions, mainly Codevasf, but subsidiarily Banco do Nordeste and Embrapa, had a major role in the development of grape exports from the Petrolina – Juazeiro region. In summary, Codevasf's actions had a positive impact on the development of the region because of three aspects:

- It provided the necessary incentives to attract potential investors with an interesting profile to the region;
- It stimulated these newcomers to bring capital and technology and share their knowledge with locals;
- It applied effective selection and control mechanisms that stimulated production, penalized speculation, and delivered highly competent producers with an entrepreneurial mind-set.

Government intervention was blessed with a rare combination of the right amount of incentive with the right amount of intervention. The most important government actions included investments in infrastructure, especially in irrigation, and subsidized water cost for an extended period of time. In addition, the government development agency in charge of the project used a very effective strategy to attract and select candidates to participate in the project. The firms selected brought capital and management know-how. The first mover brought the technical and marketing know-how necessary to export fresh fruits. The development agency also planned the transfer of know-how from the newcomers to the local farmers, by mixing their lots in the region. Finally, the agency supported and stimulated cooperative efforts among growers. Government did

not protect weak players: firms that did not comply with the norms received penalties or were excluded. This type of government actions permitted to develop a sector that remained extremely competitive, even after government support was reduced or eliminated.

## **FINAL CONSIDERATIONS**

The cultivation of grapes in the semi-arid of the São Francisco Valley was a very successful experience for several reasons. First, it attracted already established large and medium-sized firms from the South and Southeast of the country, which brought capital and management know-how. Second, among these firms, one was the first mover, and couldn't have been better selected by the government development agency in charge of the irrigation project in the area. It was the one firm in Brazil at that point that had the capital, the resources, the technical know-how, and the specific export marketing experience that was needed to make the project successful. Third, the development agency was particularly careful in mixing the planted areas that were distributed to local settlers with the larger areas allocated to the firms, in order to facilitate the transfer of know-how, a practice that is considered by experts in agricultural development as a key factor in the success of diffusion. Moreover, the benefits of this successful economic experiment were extended to the local population, which profited from a general improvement in income, education, and social status. Finally, government intervention was not directed towards protecting inefficient firms in the longer term. It was later substantially reduced, permitting these sectors to become fully competitive.

On the negative side, despite the success of the grapes experiment in the semi-arid, economic development was encapsulated in a small area, and did not really change the economic and social landscape of the broader region. The extent of spillovers was also

quite limited. This is why we called this business experiment “an island of prosperity” in an environment that remained essentially poor, although other successful experiences existed in the San Francisco Valley, such as the cultivation and exportation of mangos, and the cultivation of grapes for the production of sparkling wine.

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