



The Cotton Cooperatives in Peru: Roles, Governance, and Performance

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Abstract – Cotton production is a multibillion-dollar industry. The fibers are used to make textile products such as towels, robes, and clothing, as well as non-textile products like fishing nets, coffee filters, tents, and many other items. Due to the multi-faceted use of this crop, cotton is an important staple to the Peruvian community. To ensure the growth of this “white gold,” and to help small farms, the cotton cooperatives were formed. The government decided to create these cooperatives to continue Peru’s presence in the textile industry. Prior to the cooperatives introduction, farmers were at the mercy of the “elements.” These elements not only included climate changes, but also competition and market supply and demand. With the cooperatives in place, farmers had a little more “leeway” and a “safety net” provided by the government. If the farmers did not produce enough crops, or the crops were destroyed, the farmers originally had to find other means of earning income and bear the entire costs of the loss on their own. The government provides the farmers with the funds needed to grow the crops in way of a “loan.” The farmer then has to “sell” the crops to the government in order to re-pay the debt. However, if the farmer’s crops don’t produce enough, or are destroyed by weather changes, that loan payment can either be delayed or forgiven. This helps mainly the small local farmers, however, some of the bigger independent producers are able to have some advantages in the cooperative as well. Although, the bigger independent producers are not as dependent on the help from the government as they produce enough crops to make a decent profit. This study is to show the effect of the formation of the cooperatives; how the cooperatives help or hurt the individual farmers and how the country, as a whole, can benefit from the implementation of such government “interference.”

Keywords – Cotton Production, Cotton Cooperatives, Textile Industry, Pima, Tanguis.

I. INTRODUCTION

Cotton fiber is one of the most economically important nonfood plant commodities on the market, and cottonseed oil, another product of the cotton plant, is the second most important seed-oil crop. Cotton is a soft, fluffy staple fiber that grows in a boll, or protective capsule, around the seeds of cotton plants. The fiber is almost pure cellulose. The plant is a shrub native to tropical and subtropical regions around the world. The fiber is most often spun into yarn or thread and used to make a soft, breathable textile. In Peru, cultivation of the indigenous cotton species was the backbone of the development of coastal cultures. Cotton was grown upriver, made into nets and traded with fishing villages along the coast for large supplies of fish. Cotton is considered a Peruvian flagship product due to its fineness, quality, economic contribution, and capacity to generate jobs. Cotton can then be considered a “cash crop” for Peru. Many Peruvians rely on this staple for not only income,

but for their own needs as well. Most of the harvest is sold to the government through the cooperatives, while some remains for the use of the locals. Once the crop has been harvested, a whole new journey awaits everyone involved.

Farmers plant the cotton seeds after the equatorial rain fall, usually in January or February. They then pick the cotton bolls in June, July, or August, depending on the type of cotton grown, as some species take longer to mature. Most farmers only pick once a year, although a second crop could be gathered later in the year. However, farmers would rather not endanger the plants with the irrigation process needed as water is always readily available during that time.

Cotton is almost exclusively picked by hand in Peru. This is a long and arduous process; however, it yields a better quality crop. Using a machine can damage parts of the plant and also cause scratchy fibers to be included in the processing of the cotton boll, creating a less than ideal final product. Use of manual labor, however, can become a relatively high expense, one that is not so easily covered by the smaller farms. This causes a more heavily relied dependency from the government in order for these smaller farms to continue thriving.

Once the crop has been harvested, the cotton is then sent on to a factory where the raw material is put through a machine called a cotton gin. The cotton gin is where cotton fiber is separated from the cotton seed. The cotton fibers are processed in stages until they produce yarn or cloth. The cloth is sent to factories and turned into many different products, such as clothing, towels, and other textiles.

Although the final product is the same, not all farms are created equal. Some farmers have larger estates and can therefore grow more crops. This allows them a larger market share in the industry, leaving the smaller, less financially stable, farms with little to no chance in gaining market share. There is a slight solution to this issue: the cotton cooperative.

Cotton cooperatives were created to help the small farmers maintain their way of life and to help regulate the cotton industry. The idea behind the cooperatives is to have the government monitor the industry while assisting the low-income smaller farms to continue producing cotton. The government gives subsidies, or loans, to the farmers to ensure they are able have the funding needed to produce crops for the year.

The farmers then use the money to buy the necessary equipment, seeds, and labor force needed for the growing season. Once the plants have been harvested, the farmers take all the cotton and sell it to the government at the price set by the market. The payment from the government is used to re-pay the loan and any amount left over is a profit for the farmer.



The cooperatives help the small dependent farms the most, but they also help the larger more independent farms as well. The cotton industry is regulated by the government through the cooperatives. This makes it easier for the larger farms to sell their crops and allows them the comfort of knowing that there is always a buyer available who will buy the harvest at the market price.

A. Research Motivation

Cooperatives were created in order to provide some stability to a changing market and to provide some protection for the participants involved. Cotton cooperatives in Peru were put in place to help protect the farmers from foreign producers. The government wants to ensure that the country is able to keep up with market demand and still have a share in the industry. They provide a safety net for local farmers while ensuring the country is able to continue to provide this commodity.

Peru has an extensive and mega-diverse territory strategically located in the central zone of South America over one of the largest oceans on the Planet. It has a total area of 496,223 square miles with three geographic regions: the Coast, the highlands (Andes), and the rainforest. Peru is an APEC member – one of the most important, rich, and growing markets in the world. In order to sustain their market share, Peru must be able to keep up with the constant demand of raw materials. Maintaining the cooperatives allows them to do just that.

The cotton industry is a diverse market with many producers all over the world. How can Peru compete with so many participants? This is something I want to know myself. Peru is able to maintain its market share by producing high quality cotton. Pima cotton fibers can be more than double the length of standard cottons, a fact that gives Pima cotton some distinct and desirable qualities. Peru's pima cotton reportedly rivals high-quality Egyptian cotton and is renowned for not only being the longest-staple cotton in the world, but also for its softness. This combination of softness, strength, and durability has earned Pima cotton its global status as a luxury cotton. Peruvian harvesting techniques can also enhance the overall quality of the final product. Modernization of the cotton growing process has obviously occurred in Peru, but many Peruvian Pima plantations still harvest the cotton by hand. Handpicking leads to fewer imperfections in the yarn, giving an even softer finish. It is also a more environmentally friendly process.

Research on this topic is important for me, as I come from Peru and I am also interested in the history and involvement of this country in the global market sector. I chose the topic of cotton cooperatives because I felt that getting to know about this industry would help me understand Peru's history and future regarding the country's ability to thrive and flourish in an ever-changing world.

B. Research Objective

This study is designed to provide insight and answers to general issues that are relevant to the cotton cooperatives and their relationship between the farmers, the government, and the industry as a whole.

This study has a few important objectives: identify benefits and disadvantages in the cooperatives; Peru's textile industry market share increase; positives and negative regarding the cooperatives and cotton production. I want to identify the benefits and any disadvantages that could occur in having a cooperative between the farmers and the government. I also want to find ways to increase Peru's dominance in the textile industry's market share. I have aimed to show the positives and negatives that the cotton cooperatives have regarding cotton production, farmers, and the government as a whole. In order to fulfill the above goals, I will try to answer and clarify the following:

1. Understanding the dynamics of a cooperative and what makes it work well versus what would cause it to collapse. Since there are so many parties involved in creating and maintaining the cooperative, it could easily become corrupted or mismanaged.
2. Understand how the cotton industry works and how each producer is able to contribute to the country's market share. All farmers should have a say in how the cotton production can be increased and what economic impacts their crops may or may not have in the industry.
3. Understand how production of cotton works, from the time it is farmed to the time it is ginned. Find out the role environmental factors play in the amount of cotton being farmed. Also, understanding how to increase cotton production through genetic modification in order to increase the market share for Peruvian cotton.
4. Understand how factors, like competition and unfair treatment of the farmers, can create more problems in the production of cotton. Find ways to market Peruvian cotton to make it more desirable than other products found in the industry. Also find how the ginning companies treat the farmers in the area.
5. Understand how to reduce sector risks making it more attractive to foreign and local investors. Revisions to the infrastructure legislation could allow for more diversity in investments from not only local investors, but from outside sources as well. If there were more investors, the industry would thrive and would help promote productivity increasing Peru's share in the cotton market.

C. Research Questions

Based on my objectives, I asked the following questions in order to determine if the cotton cooperatives were beneficial to the farmers and the industry or if they were a hindrance. Three main questions in my study that I want to find answers to are the following:

1. What impact does the cotton cooperative have on the cotton market and how does it affect the farmers and local economy?
2. How does the industry determine if the cooperatives are benefiting the market or causing it more damage?
3. How can Peru increase its market share in the cotton industry?

Hopefully, these questions can also open up new ideas or suggestions on how to help Peru's economy through cotton production. I expect to find answers to these questions as well as any others that may arise during my investigation of cotton cooperatives in my home country.

II. LITERATURE REVIEW

In order to explore, in a more effective way, the issues surrounding the Cotton Cooperatives in Peru, a subset of literature has been reviewed based on its relevance to the following points: Organization of Cooperatives, Transaction Cost Theory, and Social Embeddedness. These were points that were considered in the study.

A. Organization of Cooperatives

The relationship between cooperatives and governments in most countries evolves with their economic and social structures. (Zhu and Apedaile, 1998) During its early stages, this relationship starts with active participation on behalf of the government, which also gives support to cooperatives in order to solve social and economic problems. Later on, the government will reduce its support as well as any existent privileges. This change will set the preliminary stages for a transitional stage.

The change from reliance on an export agricultural economy to participation in the global economy requires cooperatives to change their structure and face new challenges to their principles. (Zhu and Apedaile, 1998) The world economy trades intensively in intermediated goods and services. Fast social change and its involvement in the global economy are replacing the traditional ethical values of the cooperatives with values of a more competitive kind.

Cooperatives' mission, structure, and practices not only set them apart from other forms of business, but also influence how they respond to external changes. (Dunn, Crooks, Frederick and Wadsworth, 2002). Many of these changes are related and have impacted not only farmers but cooperatives also. However, because of their nature, cooperatives are often unambiguously affected.

There are many different points of view for the definition of an organization. These differences in definition are probably related to nature, structure and goals of these social organizations from one society to another and the economic and political system. Mohamed (2004) defines an organization from 4 different directions:

The First Direction: According to this direction, an organization is a special social unit.

The Second Direction: This direction presents us two definitions. On one hand, the first definition states that an organization is a social unit focused towards the pursuit of specific goals that are common to its members. On the other hand, the second definition states that an organization is a group of people organized to pursue a specific objective. This second direction clearly states that the goal of an organization is renewed according to members' requirements and social changes.

The Third Direction: According to this direction, an organization is a social system established to achieve certain pre-determined goals. It is characterized as a formal set of rules to govern the behaviors of its members as well as a system of authority to control the establishment of policies.

The Fourth Direction: The fourth direction defines organizations as synonyms of the continuous and planned cooperation and interaction among a group of individuals

in order to achieve common goals. It is important to add that the interaction amongst its members and society is governed by a set of rules and laws. These rules do not contradict community rules, standards, and laws.

Many cooperatives have shifted their legal structure from the traditional model towards either of the two new corporate governance models. These new models are the management model and the corporation model. (Bijman, 2009) The main characteristic of the management model is that members of the cooperative firm form the board of directors of the corporate society. This model indicates that the board of directors no longer consists of members of the cooperative. The main characteristic of the corporate model is that the board of directors of the society is also the supervisory committee.

B. Transaction Cost Theory

High transaction costs - including the costs of information and the costs associated with the search for trade partners and the distance to formal markets and contract enforcement - are detrimental to the efficient operation of markets for inputs and products (Williamson, 1985)

Price, authority, and trust are the three primary control mechanisms that govern economic transactions among firms (Bradach and Eccles, 1989).

Small-scale farmers in many developing countries have limited access to factors of production, credit, and information; and markets are often constrained by inadequate property rights and high transaction costs (Lyne, 1996; Matungul et al, 2001). High transaction costs, which can include the cost of information and costs associated to the search of trade partnerships, distance to formal markets, and contract enforcement, can influence negatively the efficient operation of markets for inputs and products.

Transaction costs are comparative costs of planning, adapting, and monitoring task completion under alternative governance structures (Williamson, 1996).

Differential transaction costs among households stem from asymmetries in access to assets, information, services, and remunerative markets (Delgado, 1999). Handling these problems requires renovation at an institutional level. First, the asset-deficit problem of resource-poor small-holders is so great that at times a net transfer is the only way to induce entry. Second, technical and market information for new commercial items is more likely to be of use to those who have higher levels of education and are more work-experienced. Due to this, smallholders may need special support in information and management. Third, access to services and such is often not equally distributed within communities. Lack of proper infrastructure, low population density, and low demand make it necessary to have institutions for risk-sharing and economies of scale in provisions of agricultural services, particularly in remote areas. Finally, better access to better markets for high value goods is necessary for promoting growth of smallholders' agriculture.

Transaction costs are a primary determinant of household crop income (Matungul et al, 2001). The depth



of marketing methods, the size of allocated arable lands, and off-farm income directly influence the level of crop income generated by farmers. Households with lower transaction costs can be expected to produce higher income from crops; therefore, investments in public goods, such as roads and support services would possibly affect positively the demand for locally produced goods and services.

C. Social Embeddedness

Social relations, rather than institutional arrangements or generalized morality, are mainly responsible for the production of trust in economic life (Granovetter, 1985). It is well known that firms, regardless of their size, are “connected” so that relationships among directors are properly established. That type of business relationship spreads over sociability and vice versa, especially amongst business elites. This is one of the best-documented facts in the sociological study of businesses. It is because of these relationships, that at times, disputes are frequently settled without reference to the contract or potential or actual legal actions. In the words of a businessman: “You can settle any dispute if you keep the lawyers and accountants out of it. They just don’t understand the give-and-take needed in business.”

Macro culture is a system of widely shared assumptions and values that guide actions and creates behavior patterns among independent entities (Abrahamson and Fombrun, 1992). Macro culture is something that is shared by all members of an inter-firm setting, not only top managers. Macro culture also specifies roles, role relationships, and conventions participants employ. It also coordinates interdependent activities among independent entities so that complex tasks can be completed.

There is evidence of the extent to which business relations are mixed up with social ones (Granovetter, 1985).

Restricted access reduces coordination costs, and fewer partners increase interaction frequency, which can augment the actors’ motivation and ability to coordinate smoothly. Restricted access also facilitates safeguarding exchanges. Having fewer partners decreases the amount of monitoring a firm must do.

With local ownership and control and net profits distributed to those who use the cooperative, cooperatives are considered by some to be an ideal model for local economic development (University of Wisconsin, Center for Cooperatives, 2002). The structure and goals cooperatives make compel them to act differently in their communities rather than regular businesses with different organizational structures. Additionally, cooperatives offer the right channels to individuals to unite their limited resources and capital into more competitive units. Nevertheless, few studies have tried to measure the impact of cooperatives at their state or local level. This indicates that the cooperatives’ contribution to economic development has not been quantified.

In both developed and developing countries, there are examples of innovative producer organizations and cooperatives that have proven successful in helping small producers overcome different constraints. However, they all remain limited in scale and scope. Their biggest

challenge is to build on these success stories, in order to achieve sustainable rural and agricultural development. In order to do this, relevant stakeholders need to come together with delimited objectives and responsibilities, to define the right environment so that producer organizations can develop (Food and Agriculture Organization of the United Nations (FAO), 2012).

III. METHODOLOGY

The goal of this study is to investigate the roles, governance, and performance of Peruvian cotton producers and the cooperatives they are a part of. To achieve this, we will apply a qualitative method in which interviews to members of the cotton industry and the other participants will be conducted. Additionally, to the usage of questionnaires, open-ended questions will be asked in order to obtain more in-depth answers.

It is important to point out that based on the nature of Peruvian nationals, it is not easy to find people willing to collaborate or take part in interviews unless there is something given in return for them. Also, for those who did agree to be interviewed, we need to consider how honest were the answers provided by those who participated in the interviews, and those who just did it out of curiosity. Due to this fact, some of the answers obtained were not serious at all, therefore they were not considered for this study.

This chapter presents a description of the qualitative approach employed for this study, as well as the nature of the Peruvian cotton industry and its structure. It will also present a description of the instruments, including interviews, and selection of the interviewees.

A. Qualitative Study

Qualitative interviewing is learning about different countries, their cultural points of view, and their problematic and potential solutions. It is also learning how their daily practices are different from ours. It is about discovering how others see and think about society and the world in general. Good conversational and listening skills are extremely important when conducting qualitative interviews. The results will help us understand what they think and feel about their worlds. There are several types of interviews, among many, we can mention:

1) Topical Interviews

This is the kind of interview where the interviewer is interested in reconstructing an experience and what happened. The researcher would mostly ask direct questions in order to get accurate facts.

2) Life Histories

These are the ones that deal with life experiences and/or rites of passage. These result in narratives and stories that interpret the past.

3) Evaluation Interviews

They examine new programs or school developments and suggest improvements. Since evaluation deals with incorrect behaviors as well as positive ones, justifications [accounts] of behaviors result. The result may consist of myths and unresolved tensions (Patton, 1990).



4) FocusGroup Interviews

Participants gather to exchange impressions regarding a product or institution. Participants will make an effort to preserve their competency and may not admit faults.

5) The Cultural Interview

Focuses on the norms, values, understandings, and taken-for-granted rules of behavior of a social group. This kind of interview is based on shared activities and the meaning they convey. The questions flow naturally with no fixed agenda in a relaxed atmosphere. Participants are interviewed several times in order to pursue emerging themes. The cultural interview is credible since the interviewer assumes that people are honest and share similar views.

Qualitative interviews are different from everyday interviews because it is firstly, a research tool, therefore a well-prepared interviewer must have questions that were prepared in advance. A good interviewer will become a student since he will try to get people to openly share their experience and knowledge on a particular topic. If the interviewer wants to find out something about somebody, he/she will ask in a certain way to illicit more detailed information, instead of asking directly. It is a negotiation where the product being exchanged is an answer. It is the interviewer who will later decide the quality of the answer; measuring its importance, completeness, and accuracy of the results. Later, the interviewer will ask follow up questions in order to clarify information and/or clarify missing points.

Interviews can vary depending on the degree of “structuring”. We can mention structured, semi-structured, and unstructured interviews. However, interviews vary from lightly structured to heavily structured; or from the completely unstructured to the fully structured. The in-depth interviews contain open-ended questions, which mostly get appropriate responses from the questions of “why and how”. The semi-structured format interview in which most of the respondents’ responses cannot be predicted in advance record responses with written notes. In order to achieve the desired results, I addressed the following questions during the interviews:

Questions for the Resellers:

1. Why did you decide to start reselling cotton and how long have you been doing it?
2. What are the pros and cons of being a reseller?
3. Why should farmers sell you their crops?
4. Have you considered focusing only on reselling and not so much on growing?
5. In your own words, what do you think the current situation of the cotton industry in Peru is?

Questions for the Farmers:

1. How long have you been growing cotton?
2. Do you think the Peruvian government gives farmers enough support?
3. Have you considered growing something else instead? Yes/No. Please explain.
4. Why would you sell your crop to resellers instead of selling it to the processing company?
5. In your own words, what do you think the current situation of the cotton industry in Peru is?

Questions for the Members of the Supporting Organizations:

1. In your own words, what do you think the current situation of the cotton industry in Peru is?
2. Do you think the Peruvian government gives farmers enough support? Yes/No. Why?
3. Why do farmers prefer selling their products to resellers instead of selling it to the processing company? Does this affect you directly?

B. Nature of the Cotton Industry

Agriculture and Agricultural enterprises are essential to the growth of developed countries as well as for developing countries since they contribute to the development by making their economies more sustainable, self-sufficient, and socially responsible.

Cotton is the world’s most consumed non-edible agricultural product. It is produced in many countries around the world and its fibers are used in production as the main component in the textile industry.

Among the already existent textile fibers, cotton is still the most important fiber and it is used as the basis to make pieces of clothing that benefit people all around the globe. However, regardless of its importance, the cotton industry is still a minor player in the world economy with an average of 0.08% of the world’s GDP which is approximately USD 36 billion.

International Organizations

Currently there are several organizations that protect the cotton industry. Among them we can mention:

a) ICAC (International Cotton Advisory Committee)

Located in Washington D.C in the United States, this organization was created in 1939 and it has 43 cotton producing countries as active members

b) CICC (Committee for International Cooperation between Cotton Associations)

Its members are the world’s 14 most powerful cotton-producing countries. It is a highly influential organization that safeguards all contracts and transactions within the cotton industry.

c) ACSA (The American Cotton Shippers Association)

It was founded in 1924. Its members are traders, buyers and textile agents from the United States, which are also members of other 4 associations: The Atlantic Cotton Association, The Southern Cotton Association, The Texas Cotton Association, and the Western Cotton Shippers Association.

d) LCA (The Liverpool Cotton Association)

It is one of the most important associations with more than 160 years of existence. Even though currently the cotton industry has completely disappeared in England, the amount of transactions under LCA regulations has increased significantly during the last decades.

Other institutions worth mentioning are:

- The Bremen Cotton Exchange
- ALCOTEXA (The Alexandria Cotton Exporters Association)
- The Australian Cotton Shippers Association
- Cotton USA



-SUPIMA (A non-profit organization based in the United States)

D. The Cotton Industry in Peru

1) History

Even though cotton is currently the world's most famous natural fiber to make clothing and like-products, it is the last of the natural fibers to reach its current status. During the Greek empire, Greek chroniclers wrote about a famous plant from India whose fruits were fleeces. It was not until the Sixth century BC that Alexander the great introduced Indian cotton to Greece, however regardless of Greeks and Romans using cotton to make clothing, candles, and tents; its applications didn't reach the rest of Europe until a few centuries later.

In the American continent, Pre-Hispanic Mexicans used cotton to make fabrics. During the Fifteen and Seventeenth centuries, European conquerors found pieces of clothing made out of cotton. With the invention of the cotton gin, a machine invented by Eli Whitney, cotton became the world's most famous fiber because of its quality and low production costs.

2) Cotton Farming in Peru

Currently the most important varieties of cotton available in Peru are Tangüis (78%), Pima (18.6%), Aspero (3.1%) and El Cerro (0.1%). Each of these varieties has its own distinctive characteristics. Generally, the clothing manufacturing industry prefers longer fibers, because it is more suitable for the production of threads. Based on this, it is understood that the best fiber is the longest, most resistant, and the thinnest. However, the fiber that is used the most is Tangüis due to its special characteristics of high quality at lower production costs.

Additionally, to the varieties mentioned above, farmers started experimenting with seeds that are combinations of some local and commercial varieties. For example, the Israeli transnational Hazera decided to experiment with a G-type hybrid. This hybrid develops in a period of time two months shorter than the local varieties, it produces high quality fiber (extra-long), it is highly resistant and uniform. There are also some colored cotton varieties that were obtained combining multiple local and commercial varieties of cotton. This cotton is the subject of interest for natural clothing manufacturers. Currently this naturally colored cotton is available in three colors: green, brown and beige.

Cotton crops require special climatic conditions. Arid weather and an abundant provision of water are key during the first stage of the plant's development process. After the first stage, a dryer weather is important, especially after the plant capsules open. During this stage, rain can seriously damage the crop. This stage lasts an average of 150 to 280 days (the G-type variety can be harvested after only 150 days). An average of 26°C to 32°C degrees is also necessary. Exposure to sunlight during extensive periods of time is also important to the crop. Which is why, if during this stage the weather is particularly cloudy, the plant doesn't blossom since it is extremely sensitive to any kind of shadow. Additionally, strong winds are damaging to the plant causing the fibers to fly off from the capsules. These climatic conditions are normal between the 28° of

latitude north and 47° of latitude south. More recent varieties are more resistant to salt (levels up to 5 or 6%). Furthermore, to be able to create its salt-resistant roots, cotton plants need the soil to be airy and drained.

According to the current situation in Peru, the cotton fiber has immense possibilities for development since the clothing manufacturing industry and the rest of the production chain are developing at a very steady pace when compared to the food industry.

Unlike the food industry, clothing demand is elastic and the market presents possibilities of growth, especially if Peru increases its competitiveness by developing a fiber of higher quality at a lower cost.

3) Peruvian Organizations Involved in the Cotton Industry

State-Owned Organizations

Inter-American for Cooperation on Agriculture

It was founded in 1942. It has 34 States members and it has offices at each of these states. The central office is located in Costa Rica.

Peruvian Cotton Council

It was created in 2002. Its mission is to implement policies and strategies to implement the cotton industry development. Its members are The Agriculture (Economy or Agriculture) or a representative, members of the Cotton Council, and representatives from other institutions.

Training Institutions

There are 25 Peruvian universities where a degree in Agricultural Engineering is available. The most important university is the La Molina Agrarian University, located in Lima. It is a state-owned university. To a technician level, colleges are available. In Lima, capital of Peru, there are two colleges: National Agribusiness Center located in Lima and The Valle Grande Rural Institute located in the Province of Cañete.

Researching Institutions

Due to limited resources, research related to cotton production is very limited on both state-owned and private levels.

4) Cotton Production Process

The following is simply a generic description of the cotton production process. This is due to the fact that different varieties of the plant require different conditions. As any agricultural product, the production process starts at the farm stage, to continue later at the commercialization stages.

Agricultural Production

Cotton is a temporary crop; therefore before sowing the land, a series of important measures must be applied. Any "left overs" from the previous crop must be removed, as well as any traces of the pesticides that were previously used so that the new crop doesn't catch any pests. Subsequently, the soil must be softened, aired and watered. It is only after doing this that the seed will be planted, allowing it to germinate to its full potential, originating plants with stronger stalks.

Sowing Season

It starts by disinfecting the seed so that is free of any pests and diseases. Each seed must be sown, depending on



the soil's texture, at a depth of 3 to 5 centimeters. An average of 35 to 45kg is necessary to sow a hectare of soil. The distance between furrows and shrubs will depend on the variety of cotton being sown, but personal preferences are taken into consideration.

If there are growth problems during the first days, a "re-sowing process" can be practiced; however it must be done one week after the initial sowing so that the entire land is uniform and well balanced.

Harvesting

Previously trained farmers do the harvesting process, which is done by hand. These farmers are paid based on the total weight of the harvested cotton. Harvesting is simply picking up the cotton from the plants and putting it inside plastic bags. This traditional method ensures the quality of the product, for the cotton is cleaner. However, in countries where manpower is more expensive, machines, which usage reduces costs, are used instead. This of course sacrifices the quality of the product.

Harvesting is done in two stages. The first stage is done after approximately 260 days of sowing (in the case of the Tangüis type). The second stage starts 20 to 30 days after the end of the first stage. 80% of the total production is harvested during the first stage; the remaining 20% is harvested during the second stage.

Transport and Commercialization

The harvested cotton is handed to the middlemen who will deliver the product to the processing factories. Some farmers deliver their harvests directly to the processing factories. It is there where the cotton fibers will be separated from the seeds.

The processing factories also have an important role in the production of cotton because some of them financially help the farmers with fewer resources. By doing this, risks that were assumed at the beginning only by the farmer are now shared by both the farmer and the processing factories. This practice is relatively new and has partially replaced financial aid from banks and other financial institutions in Peru.

In Peru, this system where the dealer assists the producer financially highly applies not only in the cotton production industry, but also in the production of rice, potato, pumpkin, and other crops. Calculations estimate that approximately 65% of the soil used for producing cotton was sown using funding from a third party, otherwise the total production would be dramatically reduced.

IV. FINDINGS AND DISCUSSIONS

A. PIMA Project

PIMA Project is a government-sponsored institution in charge of providing financial help to farmers in need of funding to produce cotton.

The structure of the PIMA Project is a basic flow-through of funding and crops between the farmers and the ginning company.

The ginning company funds the PIMA Project in order to give the farmers the cash and supplies necessary to

continue cultivating and producing their crops. There is only one company that is in charge of the ginning of the cotton. Once the funds are received, the farmers are able to request loans from the project.

After approving the loan, PIMA will provide capital to farmers to start producing. This capital will not be given to farmers as 100% in cash. PIMA will give part of the loan in cash to farmers to cover expenses, such as manpower, poisons, as well as other resources needed for production. The remaining amount of the loan will be given in supplies to be used in the plantation. These supplies can be seeds, poisons, or fertilizers.

Farmers must pay back the loan to PIMA using cotton, or in case of not having the necessary amount of cotton to cover the payment of the loan; the loan must be paid in cash. PIMA, as well as resellers, take care of transporting the cotton from the plantations to the processing company. If farmers want to take care of transporting the cotton on their own, they will have to cover expenses such as transportation, manpower, etc.

After PIMA receives the crops from the farmers, they contact the ginning company. The ginning company then pays PIMA for the products. It is the ginning company who sets the market price for the cotton. They will then sell the cotton to manufacturing plants to make cotton products.

B. Participants

1) Ginning Company

There is only one company that the farmers and resellers use to gin their crops. This company is in charge of setting the market price and shipping the cotton to manufacturing plants. They are the main contributor for the PIMA Project regarding funding.

2) Government

The government has minimal involvement with the cotton cooperative. They do give some funding to the PIMA Project, but are not a main contributor to the cooperative

3) Farmers

There are three main types of cotton farmers in Peru. These types can be classified as: Independent – those who have enough resources (capital) to grow cotton without having to rely on others, Semi-independent – those with resources but still rely on others (financing) to be able to grow, and Dependent – those who completely depend on financial loans or on institutions that give support to farmers.

4) Independent Farmers

Farmers who don't need to apply for loans are known as independent farmers. They are those farmers with enough capital to afford the necessary expenses. Independent farmers are common in Peru. Some are not only dedicated to growing cotton, but many other things, such as lemons, Tagetes (also known as Marigolds), or asparagus just to mention a few. There is also the odd case where an independent farmer doesn't have enough capital to start working on his plantation. In cases like this, these farmers decide to get loans from private banks since they have the necessary connections to have their loans approved. Independent farmers prefer to get loans from private banks



because payment plans are more flexible when compared to PIMA's.

5) *Semi-Independent Farmers*

The second type of farmer is known as semi-independent farmers. Semi-independent farmers are those with enough capital to invest in their plantations and to buy cotton from other farmers to resell it to the processing company. Even though these farmers have more capital than those farmers they buy the cotton from, they are not considered independent farmers because the amount of capital they have is not as big when compared to independent farmers' capital. It is because of this, that semi-independent farmers also need financial help to invest in their plantations.

6) *Dependent Farmers*

The third type of farmer is known as completely dependent farmers. They are people mostly from the countryside who inherited land from their ancestors or those who don't own land but rent it out from landlords who are no longer working on the plantation. In Piura, city located in the north of Peru, these lands are located in the districts of El Arenal and Tamarindo. The population of these two districts is mainly farmers who grow diverse products, amongst them, cotton. These farmers don't have enough capital to start working on their plantations; therefore, they need to get loans from PIMA, a governmental organization that provides support to farmers in the forms of loans and technical advice. After receiving the loans, farmers can afford paying for manpower and any other necessary expenses.

7) *Resellers*

Resellers are semi-independent farmers who buy cotton from whoever is willing to sell to them; they then later resell it to the processing company. Resellers take care of all the logistics (loading the cotton, transportation from the plantations to the processing company, etc.) After purchasing the cotton from the farmers, they will take the cotton to the processing company to sell it.

C. *Relationship of the Participants*

There are a few relationships that we should take into consideration. First, the relationship between PIMA and the processing company. The processing company is the main source of the funding, which will be used for the loans that will be given to farmers. PIMA has a contract with the processing company, which states that all the cotton collected from the farmers belongs to them. PIMA is simply acting as a representative of the processing company because they have the resources and means to handle contracts with the farmers.

Second, we have the relationship between the farmers and PIMA. Farmers that receive loans from PIMA must pay the loans not in cash, but with their crops. These crops will later go to the processing company. One of the advantages of having loans with PIMA is that they will take care of transporting the cotton from the plantations to the processing company; resellers also take care of transportation. Farmers sometimes decide to break their contracts and sell their crops to resellers because they can get the money immediately and use it for personal purposes instead of paying it back to PIMA. Other factors

can also cause farmers to break their contracts with PIMA. Bad weather conditions and strong plagues can cause plants not to produce cotton. PIMA's Accounts Receivable and Credit and Collections Departments will investigate who actually broke the contract and who didn't. There are recorded cases of farmers who lost everything during flood season that were exonerated of their payments by direct intervention of the government.

D. *Barriers*

1) *Size of the Plantations*

More than 70% of the plantations are smaller than 5 hectares. This situation negatively affects farmers because it influences their negotiation power. Additionally, the costs of hiring, consulting, or applying new technologies are expensive due to the small size of the plantations.

2) *Inappropriate Management*

Because the central government offers little to no support, except for some funding, there's no introduction of new technologies to farmers. Current cotton farmers still rely on techniques and technology from over 40 years ago. This affects, directly, the productivity of the plantations. Currently Peruvian plantations produce half of what Israeli cotton plantations produce in average.

3) *Informal Organization*

The level of informality in cotton fiber commercialization is up to 30%. This effects, negatively, any planning done previously and promotes the usage of uncertified seeds in the plantations. Additionally, informal cotton farmers compete against formal cotton farmers with relative advantages, which foreign customers see negatively since they are constantly looking for steady quality and a more formal work organization.

4) *Genetic Deterioration of Local Cotton Varieties*

Poor government support, little or no research, and the interruption of experimental seasons where researchers tried to improve the genetic quality of cotton seeds have caused the quality of the fibers to deteriorate. In other words, the Tanguis' fiber is not as fine as it used to be years ago. Nevertheless, the Peruvian Cotton Institute (IPA) with the support of the private sector, is doing research and it is also evaluating the hybrid cotton varieties that were introduced, as well as, developing new varieties using Tanguis as a reference. So far, results have been positive and it is expected to have this weakness taken care of in the near future.

5) *New Plagues and High Cost of Supplies*

New plagues cause more expenses for farmers because farmers need to buy more poisons. The introduction of new crops and poor monitoring of the already existing crops are partly responsible of the arrival of new plagues. Additionally, chemical supplies and fertilizers are expensive since they are all imported goods. All these elements combined increase the costs of production.

6) *Funding*

In Peru, farmers in general, with some exception of independent farmers, need to deal with the obstacle of a lack of capital to invest in the plantation.

Independent farmers, as mentioned previously, do not really require assistance. This is because agriculture is not their only commercial activity. Some of them are not only



dedicated to agriculture, but are also businessmen. Because of this, some independent farmers can afford growing cotton without having to apply for loans from financial institutions or from PIMA.

Those independent farmers, who do need financial help to start producing, prefer to apply for loans from private banks instead of PIMA. Loans from private banks are more attractive to independent farmers because of more flexible payment plans. Private bank loans are also more attractive to independent farmers due to the simplicity when applying for a loan. This simplicity is usually exclusive to important clients of the bank.

Both dependent farmers and semi-independent farmers require loans from financial institutions, however the requirements to have loans approved in a private bank could be overwhelming or impossible to fulfill. The second and only option is to obtain a loan from PIMA.

When farmers have surplus crops they decide to sell it to make a profit. This situation presents a new problem for farmers. The processing company is the only cotton buyer in the north of Peru. Anyone else buying cotton that is not working for the processing company is a reseller. PIMA is also considered a reseller because most of the money it loans to farmers is from the processing company. The problem for farmers is that they cannot sell the cotton directly to the processing company since they don't have the necessary connections to do so. When facing this situation, two possible solutions are available: selling the cotton to PIMA or selling it to other farmers (resellers).

In terms of money, PIMA will always pay a better price to farmers. PIMA prefers to buy cotton directly from the farmers instead of from resellers, because they know that resellers take advantage of farmers. Regardless of PIMA paying a more competitive price to farmers, ultimately they decide to sell their cotton to resellers because they pay immediately. PIMA will pay a better price but the money can only be collected after a week, sometimes even two weeks.

E. Threats

1) Range of products included in the ATPA (Andean Trade Promotion and Drug Eradication Act):

This could open the doors of Peruvian Markets to clothing and fabrics made with cotton from the United States. Low tariffs would motivate the local industry to import cotton in order to obtain duty-free benefits. This would directly hurt local producers because they simply cannot compete against foreign goods at cheaper prices. Additionally, local producers cannot obtain duty-free benefits since they are using local supplies.

2) El Niño–Southern Oscillation:

In 1983 and 1998, the total amount of harvested cotton, as well as the amount of land used to grow cotton diminished due to floods caused by intense rains. Also the entire production in Pima /SuPima was lost due to the floods.

3) New and Cheaper Alternative Crops:

During recent years, new and cheaper crops that are more profitable than cotton have started to attract the interests of farmers. Amongst many others, we can mention white onions, asparagus, table grapes, and more

recently paprika. Even though it is clear that these crops' prices fluctuate regularly, farmers are starting to use part of their lands that were designated to grow cotton before to grow these crops. This is a serious situation since it could be the link that could limit both textile and clothing manufacturing industries.

4) Loss of Fiber Quality:

Central government should promote research and education about new technologies to farmers so that they can grow crops of the highest possible quality. Also farmers should use nothing but certified seed so that the quality of the crops remains the same.

5) International Competition:

Because of all the duty-free benefits that the United States, Mexico, and the Caribbean offer to Peruvian producers, textiles sales have increased recently. Even though Peru is a far more experienced country in the area of textiles, it has been predicted that these countries will gain importance and experience due to their strategic location. Since 2005 there is no import quota for textiles from Asian countries to the United States and Europe.

6) Substitute Fibers:

This is an important threat to consider because in the local market a big percentage of clothing is made out of synthetic fibers. Nevertheless, studies show that cotton fibers are gaining more and more popularity among consumers from all over the world.

F. Opportunities.

1) Government Support for Research and Development.

The reorganization of both INIA (National Institute for Agricultural Innovation) and SENASA (National Service for Agricultural Health) is supposed to be an important tool used to give enough support to Peruvian agriculture. Cotton farmers are among those considered as priority because of the importance of cotton export for the country.

2) Insertion of New Varieties

In the future and after the experimentation stage, new hybrid varieties of cotton will represent a good opportunity for farmers as an alternative due to their potentially higher productivity. This higher productivity will also benefit and help capitalizing the Peruvian cotton industry.

3) Peruvian Stock Market

Peruvian Stock Market has mechanisms that can provide investors, banks, and pension funds the necessary warranties for them to provide financial support to farmers. In average, farmers with big lands need an estimate of S/. 46500 Peruvian New Soles (approximately 465000 NTD) to cover all production expenses.

4) Changing Trends towards the Consumption of Natural Fibers

Consumers from all over the world prefer natural fibers to synthetic fibers. Among them, cotton is one of the natural fibers with the fastest increasing demand. This gives Peru a competitive advantage over competitors from Asia who utilizes mostly synthetic fibers.



5) *Preferential Custom Benefits:*

Recent conversations with the Andean Community stated a strong possibility of a future where agriculture supplies will only have 0% or 5% of common external tariff. This low tariff will help to quickly develop the industry for new technologies and make them more affordable. Regarding clothing and fabric exports, clothing and fabrics made with local supplies are expected to be included in the revised version of the ATPA (Andean Trade Preference Act) Once approved, export volumes to Peru's main market, the United States, are expected to increase quickly.

6) *New Potential Markets:*

Besides the American market, there are other potential markets willing to buy high quality cotton. Peruvian cotton clothing and fabrics have successfully entered Europe. This is considered a small, yet important step to reach even more important markets such as the haute couture market and others.

V. CONCLUSION

Peru is divided in three natural regions - the coast, the highlands (mountains) and the rainforest. However, the coast has been the area whose agriculture is better developed. None of the other two regions has received as much support nor had the exceptional climatic conditions the coast has. Throughout the eighties farmers, investors, as well as politicians, were convinced that agriculture's future was linked to its capacity to export and that the Peruvian coast had several advantages which allow it to focus more on international markets.

Cotton farmers say that the sector's current situation is the ginning processing company's fault. Having only one ginning processing company in Piura, it is clear that its favorable market position gives it authority over the market price. A 2002 study found evidence that the ginning processing company was taking advantage of the farmers. Evidence of this included the lower prices paid to farmers for their crops, which was in contrast to the comparison of higher prices paid for imported cotton; as well as discrimination policies towards farmers for reasons that cannot be justified from an economic perspective.

The influence of the ginning processing companies needs to be reduced. The creation of enterprises, organizations, or farmers associations will help eliminate the atomization of the cotton supply and will maximize the benefits through better cost efficiency. These associations could also hire business consultancy services, which will help them increase their negotiation power when dealing with the ginning processing company.

Even though cotton is one of the most important crops in Peru, production decreases more and more each year. The textile industry is one of the most successful sectors in Peru, even though it is directly related to the cotton agro-industry; the production of cotton has not improved. Actually, cotton agro-industry productivity hasn't improved in the last twenty years and has lost its competitiveness against other countries that produce cotton.

So, what can be done to save Peruvian cotton? There is plenty to be done. Genetics experts agree that the only viable option to cotton farmers is to grow cotton that produces higher quality fibers – longer fibers – since their commercialization value is higher. Peruvian high quality cotton is still there, however the fact that it needs more time than other varieties to grow, is what discourages farmers, therefore other crops appear as better options.

The government needs to make the sector more attractive to foreign and local investors. In order for this to happen, sector risks need to be reduced as low as possible. This could be done by revising the current agricultural infrastructure legislation, which includes the laws of water supply and property ownership formalization. These improvements will attract private investors, as they will find more, and better, reasons to invest in the cotton agro-industry.

Another viable option to attract private investors is the creation of an efficient legal framework. Investments will help promote the acquisition of more productive units and their fusion or consolidation into productive units of a larger scale. These larger scale production units will help create greater economies of scale as well as increase negotiation power for cotton farmers and entrepreneurs.

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